ISSN 2464-9724

Maritime Safety and Security Law Journal

2023

Issue 13

Maritime Safety and Security Law Journal

Editors

Gemma Andreone

Institute for International Legal Studies, National Research Council, Italy

Giovanni Ardito

International Seabed Authority

Anna Petrig

University of Basel, Switzerland

Assistant Editors

Ludovica De Benedetti

Institute for International Legal Studies, National Research Council, Italy

Consiglio Nazionale delle Ricerche ISGI INSTITUTE FOR INTERNATIONAL LEGAL STUDIES

Universität Basel

Maritime Safety and Security Law Journal

Advisory Board

Maritime Safety and Security Law Journal

Table of Contents

Maritime Safety and Security Law Journal

Spaceports on Coastal Areas and Spaceflights: Legal Considerations on the Protection of Marine Environment

*Anne-Sophie MARTIN**

Abstract

Spaceports located on coastal areas can have adverse consequences for the marine environment including acoustic disturbance (e.g. underwater noise) from launch, as well as flight paths passing over these areas affecting marine biodiversity, toxic contaminants and thermal effects from any discharges arising from these activities. Spaceport activities can also affect the displacement of animals and seabirds, as well as alter the seascape through coastal changes.

The protection of the marine environment from launch and spaceflight activities represents an unaddressed issue in the law of space activities and the law of the sea. The paper therefore aims to analyse the space legal regime and the instruments of soft law, such as the 2019 Long-term Sustainability Guidelines, which might be of relevance for safeguarding the marine environment.

Then, the paper considers the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, which constitutes the first global convention to protect the marine environment from human activities. The paper also focuses on the 1997 London Protocol which further develops and updates the Convention. The objective of these two legal instruments is to promote the effective control of all sources of marine pollution. Indeed, contracting parties shall take effective measures to prevent pollution of the marine environment caused by dumping at sea.

Furthermore, the paper deals with the policy and strategy adopted at national level considering environment and biodiversity preservation, in the specific case of spaceports located on coastal areas such as (i) the United Kingdom (Cornwall, England), (ii) Norway (Andoya), (iii) France (Kourou in French Guyana), (iv) New Zealand (Mahia Launch Complex located close to Ahuriri Point) and (v) John F. Kennedy Space Center in Florida (USA). States and regulators should consider the implementation of "marine environmental impact assessment" and foresee the adverse effects of spaceflight activities on the coastal environment, as well as including proposals to mitigate these impacts. The paper argues that these elements should be included in the authorizations and licenses that states provide for national activities (Article VI of the Outer Space Treaty).

Keywords: space law, law of the sea, regulation, launch activities, spaceflight, pollution, marine environment protection, environmental impact assessment, information sharing

First published online: 29 December 2023

*PhD in Public, Comparative and International Law, Department of Political Sciences, Sapienza University of Rome, Visiting Researcher, Institute for International Legal Studies (ISGI-CNR) martin.annesophie@yahoo.fr.

1. Introduction – Pollution of the Marine Habitat: Consequences of Launches, Emissions of Harmful Substances and Re-Entry of Spacecrafts

In recent years, a growing number of actors, both public and private, have entered the space sector and new space missions are being carried out, such as suborbital flights and exploration projects. These new programmes imply an increase in launches and the creation of additional spaceports[1]. As of 31 January 2023, 35 spaceports are used for launching satellites or spacecraft for suborbital flights.[2] 21 of these launch pads are located on coastal areas mainly for safety and security reasons.[3] Indeed, they represent the safest way to conduct launch activity in areas without populations, housing or infrastructure. However, if there is a launch failure or a spacecraft re-entry, space objects or debris can fall into the sea.[4]

Space activities, defined as launching space objects into outer space, operation, control and return of space objects to Earth,[5] have consequences on Earth's environment, especially space transportation, even if they are seen as less pollutant than air transport. Indeed, the aviation sector is a major source of greenhouse gas (GHG) emissions worldwide[6] and represents a significant challenge to be addressed. The impact of air transport on climate change is regularly highlighted. While the aviation sector represents the second biggest source of transport GHG emissions after road transport, the increase in space launches also raises questions.[7] Although Earth orbit is not yet a tourist destination, it could soon become one.[8] Thus, there is now a willingness from space agencies and companies to develop "green fuel technology", for instance the "Green Propellant Infusion Mission" (GPIM),[9] due to the increasing number of launches[10] needed to conduct new space activities, such as lunar exploration and space tourism.

---

1 Stephan Hobe, *Space Law* (Nomos 2019) 177-180; Annette Froehlich (ed), *Spaceports in Europe* (Springer 2021).

2 'Spaceports & Launch Sites' (*Goastronomy*, 1st November 2023) <www.go-astronomy.com/space-ports.php#:~:text=Spaceports%20%26%20Launch%20Sites,suborbit%2C%20orbit%2C%20and%20beyond> accessed 22 March 2023; 'Spaceports of the World' (*Aerospace Security*, 31 January 2023) <https://aerospace.csis.org/data/spaceports-of-the-world/> accessed 22 March 2023.

3 The terms 'spaceport' and 'launch pad' are used as synonym in the paper.

4 See Vito De Lucia, 'Oceanic dumping of space objects and the conservation of marine biodiversity in areas beyond national jurisdiction' in Marietta Benkö and Kai-Uwe Schrogl (eds), *Outer Space, Future for Humankind: Issues of Law and Policy* (Eleven 2021) 213-238.

5 'Space activity' (*Law Insider*) <www.lawinsider.com/dictionary/space-activity#:~:text=Space%20activity%20means%3A%20Launching%20space,essential%20activities%20in%20this%20connection> accessed 24 March 2023.

6 Hyejji Kim and Jacob Teter, 'Aviation' (IEA 11 July 2023) <www.iea.org/reports/aviation> accessed 6 November 2023.

7 European Commission, 'Reducing emissions from aviation' highlights that 'The aviation sector creates 13,9% of the emissions from transport...' <https://climate.ec.europa.eu/eu-action/transport-emissions/reducing-emissions-aviation_en> accessed 22 March 2023; Robert G. Ryan et al., 'Impact of Rocket Launch and Space Debris Air Pollutant Emissions on Stratospheric Ozone and Global Climate' (2022) 10 Advancing Earth and Space Science 6.

8 Katharine Gammon, 'How the billionaire space race could be one giant leap for pollution' (19 July 2021) The Guardian <www.theguardian.com/science/2021/jul/19/billionaires-space-tourism-environment-emissions> accessed 22 March 2023; Tereza Pultarova, 'The rise of space tourism could affect Earth's climate in unforeseen ways, scientists worry' (26 July 2021) Space <www.space.com/environmental-impact-space-tourism-flights> accessed 23 March 2023.

9 NASA Space Technology Mission Directorate, 'Green Propellant Infusion Mission (GPIM)' (*NASA,* 5 March 2021) <www.nasa.gov/mission_pages/tdm/green/index.html> accessed 28 March 2023; ESA, 'Testing Green Propellants with Existing Systems' (*ESA,* 10 December 2020) <www.esa.int/Enabling_Support/Space_Engineering_Technology/Shaping_the_Future/Testing_Green_Propellants_with_Existing_Systems> accessed 28 March 2023; Matthieu Delacharlery, 'Les avions… et maintenant les fusées ? La NASA s'apprête à tester un carburant "vert"' (*TF1 Info*, 17 juin 2019) <www.tf1info.fr/sciences-et-innovation/les-avions-et-maintenant-les-fusees-la-nasa-s-apprete-a-tester-un-carburant-vert-falcon-heavy-space-x-elon-musk-2124336.html> accessed 22 March 2023.

10 'L'année spatial 2022: le bilan des lancements orbitaux' (*Un autre regard sur la Terre*, 26 January 2023) <https://unregard-sur-la-terre.org/2023/01/l-annee-spatiale-2022-le-bilan-des-lancements-orbitaux.html> accessed 22 March 2023 highlights that : '*179 lancements orbitaux réussis, +33% par rapport à 2021 (135 lancements réussis en 2021)*'.

Among the largest emitters of pollutants and greenhouse effect emissions are the solid rocket boosters that once propelled the Space Shuttle, which now power Ariane 5 and the Space Launch System (SLS) rockets.[11] The launch of a rocket generates up to 300 tons of carbon dioxide in the upper atmosphere, where it can persist for many years.[12] Moreover, several thousand space wrecks that may contain fuel residues litter the oceans.[13]

Reducing the ecological impact of space launches is a major objective of industry, as important as reducing costs[14]. Among the possibilities for improvement are the rehabilitation of former industrial sites, the study of local production of rocket biofuel, the reuse of the first stage of the rocket,[15] no longer using toxic propellants or the replacement of previous models of European launchers, such as Ariane 5 and Vega.[16]

Space activities can impact Earth's environment and in particular the marine environment. Article 1(4) of the 1982 United Nations Convention on the Law of the Sea (UNCLOS)[17] defines "pollution of the marine environment", such as the "introduction by man, directly or indirectly, of substances or energy into the marine environment [...] which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities [...]".

Spaceflight operations can affect the marine environment in different ways: (i) by the construction of spaceports on coastal areas; or (ii) by launch or re-entry operations that may result in vehicle components falling into national and international waters. In addition, spaceports located on coastal areas can have adverse consequences for the marine environment including[18]: (i) effects from jettisoned objects with marine wildlife, vessels or offshore installations and infrastructure; (ii) acoustic

11 'Le spatial est-il écolo?' (12 November 2020) Radio France <www.radiofrance.fr/franceinter/podcasts/la-terre-au-carre/le-spatial-est-il-ecolo-7865971> accessed 22 March 2023; European Space Agency, 'Clean and Eco-Friendly Space' (*ESA,* 7 May 2019) <www.esa.int/Enabling_Support/Preparing_for_the_Future/Discovery_and_Preparation/Clean_and_eco-friendly_space> accessed 22March 2023; Marck Piesing, 'The pollution caused by rocket launches' (15 July 2022) BBC <www.bbc.com/future/article/20220713-how-to-make-rocket-launches-less-polluting> accessed 28 March 2023.

12 Katharine Gammon (n 8).

13 Vito De Lucia and Viviana Iavicoli, 'From Outer Space to Ocean Depths: The "Spacecraft Cemetery" and the Protection of the Marine Environment in Areas Beyond National Jurisdiction' (2019) 49 California Western International Law Journal 2, 345-389.

14 Le spatial est-il écolo ? (n 11).

15 ArianeGroup, 'For the first time, ArianeGroup tests a complete reusable space launcher stage' (*Ariane Group*, 23 June 2023) <https://press.ariane.group/arianegroup-a-teste-pour-la-premiere-fois-un-etage-complet-de-lanceur-spatial-reutilisable-8915/> accessed 5 September 2023.

16 Le spatial est-il écolo? (n 11); see also European Space Agency, 'Ariane 6 and Vega C: new generation of European Launch Vehicles' (*ESA,* 6 June 2019) <www.esa.int/ESA_Multimedia/Transmissions/2019/06/Ariane_6_and_Vega_C_new_generation_of_European_Launch_Vehicles> accessed 12 August 2023.

17 United Nations Convention on the Law of the Sea (adopted 10 December 1982, entered into force 16 November 1994) 1833 UNTS 396 (UNCLOS). There are 168 States parties to the Convention which offers a comprehensive legal framework for the preservation, conservation of the marine environment.

18 UK Department for Transport, 'Guidance to the regulator on environmental objectives relating to the exercise of its functions under the Space Industry Act 2018' (2021) 24-25, <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/995153/guidance-to-the-regulator-on-environmental-objectives-relating-to-the-exercise-of-its-functions-under-the-space-industry-act-2018.pdf> accessed 22 March 2023; Alla Pozdnakova, 'Oceans as spaceports: state jurisdiction and responsibility for space launch projects at sea' (2020) 26 Journal of International Maritime Law, 268.

interference[19] and disturbance (including underwater noise) due to launches, as well as the impact of the jettisoned objects on the sea surface; (iii) toxic substances;[20] (iv) thermal effects of jettisoned objects; (v) ingestion of objects by marine animals and seabirds; (vi) sediment quality; and (vii) displacement of mammals and seabirds[21].

The space legal framework does not specifically refer to spaceports[22] and the preservation of the marine environment because space transportation has not been considered as pollutant until now.[23] However, the issue of space debris[24] and the necessity to preserve the long-term sustainability of space activities[25] are major concerns in the space sector, compared to the problem of the preservation of the marine environment due to spaceflight activities.

The paper analyses some of the provisions of the United Nations space treaties in the field of environment protection, as well as the regime of the law of the sea that provides relevant elements for safeguarding the marine habitat. These requirements could be then incorporated into future standards or guidelines for space activities. There is a need to protect the marine environment and its biodiversity from pollution caused by the dumping of wastes and other materials, e.g. space debris when they fall into the sea, gas emissions during launch and other adverse consequences including noise impacting marine animals, where launches are procured on coastal areas or at sea. The paper addresses first the 1967 *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies*[26] (Outer Space Treaty – OST). Then, it deals with the law of the sea as a legal foundation for the protection of the marine environment from spaceflight pollution. The paper aims to highlight the interactions between both regimes. This 'holistic' approach is necessary in order to determine current legal gaps and to find appropriate solutions at international and national levels for the protection of marine environments around coastal spaceports. Lastly, it analyses the regulation adopted by states at national level to resolve the lacunae in the international legal framework. In-

19 'What are 4 Sources of Noise Pollution by Humans in the Ocean?' (*Sinay Maritime Data Solution*, 25 May 2022) <https://sinay.ai/en/what-are-4-sources-of-noise-pollution-by-humans-in-the-ocean/> accessed 8 August 2023; Ministère de la Transition Ecologique et Solidaire 'Recommendations to limit the impacts of manmade underwater acoustic emissions on marine wildlife' (1st June 2020).

20 Karen N Scott, 'Ocean Acidification: A Due Diligence Obligation under the LOSC' (2020) 35 International Journal of Marine and Coastal Law, 382-408.

21 UK Marine Management Organisation, 'Displacement and habituation of seabirds in response to marine activities' (May 2018) MMO 1139 <https://assets.publishing.service.gov.uk/media/5b1fae7b40f0b634b469faac/Displacement_and_habituation_of_seabirds_in_response_to_marine_activities.pdf> accessed 6 November 2023.

22 Michael Gerhard and Isabelle Reutzel, 'Law related to space transportation and spaceports', in Ram S. Jakhu and Paul S. Dempsey (eds), *Routledge Handbook of Space Law* (Routledge 2016) 268-287.

23 Alla Pozdnakova, 'Pollution of the Marine Environment by Spaceflights' in Froukje Maria Platjouw and Alla Pozdnakova (eds), *Environmental Rule of Law for Oceans: Designing Legal Solutions* (Cambridge University Press 2023) 2-3.

24 Christopher Newman and Thomas Cheney, 'Barriers and Gateways to Cleaning Up Earth Orbit: the Legal, Economic and Political Dimensions of Debris Remediation' (2023) 48 Air&Space Law, 113-136; Anne-Sophie Martin and Steven Freeland, 'From One to Many: "Mega" (Constellation) Challenges to the Legal Framework for Outer Space' (2021) XLVI Annals of Air and Space Law, 152 ss.

25 Minoo Rathnasabapathy and Emmanuelle David, 'Space Sustainability Rating in Support of the Development and Adoption of Regulatory Guidelines Related to Long-Term Sustainability' (2023) 48 Air&Space Law, 155-178.

26 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies [1967] 610 UNTS 205.

deed, states have developed policies and strategies on the preservation of marine environments around launch pads located on coastal zones, also taking into account the case of space objects' re-entry after the completion of the mission.

2. A Space Legal Framework under Test

2.1 The Outer Space Treaty and the Protection of Earth's Environment

It is first necessary to consider the Outer Space Treaty. Article III of the OST provides that "in the exploration and use of outer space, including the Moon and other celestial bodies, States shall carry on activities in accordance with international law [...]".[27] Thus, principles of international law might have some application to space activities[28] conducted on Earth, such as spaceflight activities and in outer space. States' obligations in carrying out space operations have to be examined in application of international environmental law.[29] In addition, states conducting space activities have to consider the protection of Earth's environment[30], including marine environment, and the objectives of sustainable development in order to strengthen the obligations of the protection of environment in the space legal framework.

In addition, according to Article VI of the Outer Space Treaty,[31] states hold international responsibility for their national governmental and non-governmental activities in outer space. It also foresees that the "activities of non-governmental entities in outer space, including the Moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty". Consequently, states are responsible for national space activities and they have to ensure that space operations are conducted in accordance with international law provisions. With this in mind, states wishing to regulate their national spaceport activities[32] could introduce environmental (and more specifically marine) impact assessments (EIAs)[33] as a specific requirement for obtaining authorisation and licence, considering in particular national marine protection policy as detailed in section 4. EIA represents a tool for an initial assessment of eventual impacts of space operations on Earth's environment.[34]

---

27 Olivier Ribbelink, 'Article III' in Stephan Hobe, Bernhard Schmidt-Tedd' in Kai-Uwe Schrogl and Gérardine Meishan Goh (eds) *Cologne Commentary on Space Law Vol.1* (Carl Haymanns Verlag 2009) 64-69.

28 Francis Lyall and Paul B. Larsen, *Space Law A Treatise* (Routledge 2018) 246 ss; Anne-Sophie Martin and Steven Freeland, 'Back to the Moon and Beyond: Strengthening the Legal Framework for Protection of the Space Environment' (2021) 46 Air and Space Law 3, 420.

29 See Lotta Viikari, *The Environmental Element in Space Law: Assessing the Present and Charting the Future* (Martinus Nijhoff Publishers 2008); Ian H. Rowlands, 'Atmosphere and Outer Space' in Daniel Bodansky, Jutta Brunnée and Ellen Hey (eds.), *The Oxford Handbook of International Environmental Law* (Oxford University Press 2008) 332.

30 See Patricia Birnie, Alan Boyle and Catherine Redgwell, *International Law and the Environment* (Oxford University Press, 2021); Nicolas de Sadeleer, *Environmental Principles* (Oxford University Press 2020).

31 Michael Gerhard, 'Article VI' in Stephan Hobe, BernhardSchmidt-Tedd' in Kai-Uwe Schrogl and Gérardine Meishan Goh (eds) *Cologne Commentaryon Space Law Vol.1* (Carl Haymanns Verlag 2009) 103-125.

32 Michael C. Mineiro, 'Law and Regulation Governing U.S. Commercial Spaceports: Licensing, Liability and Legal Challenges' (2008) 73 Journal of air law and commerce 4, 759-805; Steve Mirmina and Caryn Schenewerk, *International space law and space laws of the United States* (Edward Elgar Publishing 2022).

33 Convention on Environmental Impact Assessment in a Transboundary Context (adopted 25 February 1991, entered into force 10 September 1997) 1989 UNTS 309 (Espoo Convention) Article 2(3); Lotta Viikari, 'Environmental Impact Assessment and Space Activities' (2004) 34 Advances in Space Research 11, 2363-2367.

34 France : articles 8, 15, 16,17 de l'Arrêté du 23 février 2022 relatif à la composition des trois parties du dossier mentionné à l'article 1er du Décret n° 2009-643 du 9 juin 2009 relatif aux autorisations délivrées en application de la loi n° 2008-518du 3 juin 2008 modifiée relative aux opérations spatiales. See also 'L'environnement en actes' (*CNES*, 5 juin 2019) <https://cnes.fr/fr/dossier-cnes-lenvironnement-en-actes> accessed 22 March 2023; Belgium: article 8 of the Law of 17 Sept. 2005 on the Activities of Launching, Flight Operation or Guidance of Space Objects; Denmark: part 4 of the Executive Order No. 552 of 2016; Finland: chapter 2 – Section 10 of the 2018 Act on Space Activities; Greece: articles 4, 5 and 6 of the Law 4508/2017on Space Activities; Australia: articles 47 (a), 50 (g), 53, 54 and 91 of the Space (Launches and Returns) (General) Rules 2019; Nigeria: sections 9 and 10 of the 2015 Regulations on Licensing and Supervision of Space Activities.

Article IX of the Outer Space Treaty[35] is a key provision in the space legal framework because it stresses that "in the exploration and use of outer space, States Parties shall be guided by the principle of cooperation and mutual assistance and shall conduct all their activities in outer space with due regard to the corresponding interests of all other States". It adds that "States shall conduct exploration of outer space, including the Moon and other celestial bodies, so as to avoid their harmful contamination and also adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter and, where necessary, shall adopt appropriate measures for this purpose". This provision could be extended to the effects of launches on the Earth's environment, including the atmosphere and marine environment.

The space legal framework contains relevant but broad norms such as the principle of cooperation, mutual assistance, due regard[36] and the duty of consultations in case of hazardous activities or harmful interference in the conduct of space activities.

The lack of specific norms on states' obligations regarding protection of Earth's environment in the space legal framework, apart from Article IX of the Outer Space Treaty dealing with the protection of the Earth's environment "resulting from the introduction of extraterrestrial matter", undermine the effective application of environmental law in the space field. Indeed, international space law does not make reference for instance to the duty to conduct an environmental impact assessment before embarking on space activity. Nevertheless, the concept is introduced at a national level through domestic space legislation and can be required by states to private entities in order to obtain authorisations and licences to carry out space activities.

It is also worth mentioning that in 1999, during UNISPACE III,[37] the United Nations recognized that action should be taken to protect the Earth's environment and in particular "to ensure, to the extent possible, that all space activities, in particular those which may have harmful effects on the local and global environment, are carried out in a manner that limits such effects and to take appropriate measures to achieve that objective".[38] One can admit that there is an obligation for states to adopt appropriate measures to prevent environmental harm caused by space activities, including spaceflights. This concept is linked to the precautionary principle[39], a principle of debatably customary nature,[40] which advocates that given the high risks associated with space activities, where there

35 Sergio Marchisio, 'Article IX' in Stephan Hobe, Bernhard Schmidt-Tedd, Kai-Uwe Schrogl and Gérardine Meishan Goh (eds) *Cologne Commentary on Space Law Vol.1* (Carl Haymanns Verlag 2009) 169-182.

36 Neta Palkovitz, 'Exploring the Boundaries of Free Exploration and Use of Outer Space – Article IX and the Principle of Due Regard, Some Contemporary Considerations' (2014) 57 Proc. Colloquium on the L. Outer Space, 93–105.

37 Given the immense potential of space technology for socioeconomic development, the United Nations organized three unique global Conferences on the Exploration and Peaceful Uses of Outer Space – UNISPACE I in 1968, UNISPACE II in 1982 and UNISPACE III in 1999, <www.unoosa.org/oosa/en/aboutus/history/unispace.html> accessed 5 October 2023.

38 UNGA 'Resolution 1 The Space Millennium: Vienna Declaration on Space and Human Development' of the 'Report of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III)' (19-30 July 1999) UN Doc A/CONF.184/6 point 1(a)(v), 7.

39 Claudia Cinelli and Katarzyna Pogorzelska, 'The Current International Legal Setting for the Protection of the Outer Space Environment: The Precautionary Principle Avant La Lettre' (2013) 22 Rev. Eur. Community & Int'l Envtl. L. 2, 186–201; Paul B. Larsen, 'Application of the Precautionary Principle to the Moon' (2006) 71 Journal of Air Law and Commerce 2, 295–306.

40 Paul B. Larsen, 'Application of the Precautionary Principle to the Moon', Journal of Air Law and Commerce, 71(2), 2006, 295-306; Olavo de O. Bittencourt Neto, 'Preserving the Outer Space Environment: the "Precautionary Principle" Approach to Space Debris' (2013) 56 Colloquium on the Law of Outer Space, 341–351.

are threats of serious or irreversible damage, a lack of full scientific certainty should not be used as reason for postponing the adoption of effective measures to prevent environmental degradation.[41] However, the requirements for identifying the risk of environmental "harm", including the need to adopt measures, are ambiguous.[42] Indeed, the effectiveness of the precautionary principle in the light of scientific doubt with respect to space activities, and in particular considering the impact of spaceflights on Earth's environment and marine pollution, is not specifically formulated in the space legal framework.[43] Nevertheless, it is appropriate to point out that the 1992 Principles Relevant to the Use of Nuclear Power Sources in Outer Space deals with the concept of a "safety assessment".[44] Principle 4 provides that "A launching State [...] shall, prior to the launch, through cooperative arrangements, where relevant, with those which have designed, constructed or manufactured the nuclear power sources, or will operate the space objects [...] ensure that a thorough and comprehensive safety assessment is conducted. This assessment shall cover as well all relevant phases of the mission and shall deal with all systems involved, including the means of launching, the space platform, the nuclear power source and its equipment [...]". This principle could be introduced in guidelines for space transportation taking into account the environmental assessment of such activities and the obligation to prevent environmental damage on Earth due to spaceflight activities.

2.2 Overview of the Guidelines for the Long-term Sustainability of Outer Space Activities: Food for Thoughts on Preserving Marine Ecosystem

This part focuses on the Guidelines for the Long-term Sustainability of Outer Space Activities[45] (LTS Guidelines) adopted in 2019 by the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS)[46]. The LTS Guidelines are a set of 21 voluntary principles. They represent a non-legally binding instrument but they are an important tool for the protection of space environment and to ensure that space activities are conducted in a safer manner for present and future generations. They contain relevant elements that could be taken into consideration for the protection of the marine environment, in particular regarding the sharing of information about the impact of spaceflights on ocean areas. Indeed, an important obstacle is the lack of adequate scientific data and information on

41 Anne-Sophie Martin and Steven Freeland (n 28) 423; Jinyuan Su, 'Control Over Activities Harmful to the Environment', in Ram S. Jakhu and Paul S. Dempsey (eds) *Routledge Handbook of Space Law* (Routledge 2017) 73–89.

42 Martha Mejía-Kaiser, 'Space Law and Hazardous Space Debris' (30 January 2020) Planetary Science.

43 Lotta Viikari (n 33) 172.

44 UNGA Res 47/68 (14 December 1992) UN Doc A/RES/47/68, Principle 4 'Safety assessment'; see Daniel A. Porras, 'The United Nations Principles Relevant to the Use of Nuclear Power Sources in Outer Space: the Significance of a Soft Law Instrument after nearly 20 Years in Force', in Irmgard Marboe (ed), *Soft Law in Outer Space* (Böhlau 2012) 205-232.

45 UNGA 'Report of the Committee on the Peaceful Uses of Outer Space, Sixty-second session' (12-21 June 2019) UN Doc A/74/20; Peter Martinez, 'The UNCOPUOS Guidelines for the Long-Term Sustainability of Outer Space Activities' (2021) 8 Journal of Space Safety Engineering 1, 98-107; Peter Martinez, 'Implementing the Long-Term Sustainability Guidelines: What's Next?' (2023) 48 Air&Space Law, 41-58.

46 UNGA Res 1348 (XIII) (13 December 1958) UN Doc A/RES/1348(XIII) lead to the creation of the United Nations Committee on the Peaceful Uses of Outer Space as an ad hoc Committee. In 1959, the UNGA converted the UNCOPUOS into a permanent subsidiary body, reaffirming its mandate in UNGA Res 1472 (XIV) (12 December 1959) UN Doc A/RES/1472; see Tanja Masson-Zwaan and Mahulena Hofmann, *Introduction to Space Law* (Wolters Kluwer 2019) 10-11.

the environmental effects of spaceflight operations.[47] Some elements mention in the LTS Guidelines dealing in particular with the collection, sharing and dissemination on data and information space debris,[48] space weather, and orbital events might be of relevance for the development of standards or best practices related for instance to the sharing of operational data, the development of models and tools on the mitigation of spaceflights effects on marine environment.

Guideline A.2 deals with the elements to consider when developing, revising or amending national regulatory framework for outer space activities. In particular, it promotes the creation of "(d) regulations and policies that support the idea of minimizing the impacts of human activities on Earth [...]".

Guidelines B.2 and B.3 focus on the improvement of orbital data on space objects and the enhancement of practice and utility of sharing orbital information on space objects, as well as the promotion of the collection, and the sharing and dissemination of space debris monitoring information. Those elements could be taken into consideration in the development of guidelines addressing the impact of space launches on marine environments and biodiversity, as well as the case of space objects' re-entry by encouraging the sharing of information and data on the various areas affected by launches. Soft law instruments, such as guidelines, even they are not legally binding, pressure states politically and their violation could be contrary to "best practice" in space activities. Unlike hard law, soft law is more readily accepted by states and private entities[49]as it is easier to adapt and is also much more effective by virtue of "peer pressure"[50], including its subsequent implementation in national space legislation.

Guideline B.5 emphasizes the need to develop practical approaches for pre-launch conjunction assessment. In particular, states and international intergovernmental organizations are encouraged to consider developing and using mechanisms to provide information on launch schedules, to assess the future population of space objects, and to inform mariners and pilots on restricted zones at sea and in airspace.[51] This Guideline could be applied to the risk of marine pollution by spaceflights with the duty to provide information on the extent of pollution after a certain number of launches.

Guideline B.6 on the sharing of operational space weather data stresses that "States should monitor, to the extent feasible, space weather continuously and to share data and information with the aim of establishing an international space weather database network".[52] These elements of sharing information and data on the consequences of spaceflight activities would also be relevant in the field of the protection of marine environment, fauna and flora, and on the importance of providing information

47 See Greenpeace, 'Concerns relating to de facto disposal at sea of jettisoned space vehicle components' (LC/SG 41/8/2) (September 2018) <www.greenpeace.to/greenpeace/wp-content/uploads/2018/09/LC-SG-41-8-2.pdf> accessed 22 March 2023.

48 See the Inter-Agency Space Debris Coordination Committee (IADC) 'Space Debris Mitigation Guidelines' (IADC-02-01) (Rev 2 2020, first version adopted in 2002); COPUOS 'Space Debris Mitigation Guidelines' (2007).

49 Peter Martinez, 'The Role of Soft Law in Promoting the Sustainability and Security of Space Activities' (2020) 44 Journal of Space Law, 522-564; see also Irmgard Marboe (ed), *Soft Law in Outer Space* (Böhlau 2012).

50 Irmgard Marboe, 'Space Law Treaties and Soft Law Development' (Speech at the United Nations/China/APSCO Workshop on Space Law, Beijing, China, 17 to 20 November 2014) <www.unoosa.org/documents/pdf/spacelaw/activities/2014/pres02E.pdf> accessed 9 October 2023.

51 LTS Guidelines B.5 (6).

52 LTS Guidelines B.6 (2).

on pollution components affecting this ecosystem in order for states to adopt adequate measures for preserving and safeguarding marine habitat. In addition, states and international intergovernmental organizations should also consider sharing real-time and near-real-time critical space weather data and data products in a common format, promoting and adopting common access protocols for their critical space weather data and data products, and promoting the interoperability of space weather data portals, thus promoting ease of data access for users and researchers.[53] It is interesting here to note the importance of real-time information, that is, accurate and recent data, including in the case of pollution due to spaceflight activities, considering marine streams and migration of mammals.

LTS Guidelines do not specifically deal with the effects of space activities on Earth and specifically on the marine environment but they contain elements that might be useful in the development of future guidelines and standards for mitigating and remediating marine pollution due to launch activities and re-entry of objects. What is being developed in terms of practical approaches to space debris and space weather could also be adapted to the marine environment, particularly in terms of information sharing. It is crucial to strengthen the exchange of information and data on the consequences of spaceflight on ocean areas. Those elements on the sustainability of space activities are useful and necessary in order to mitigate and remediate space debris, it could also be relevant in the field of marine environment. Furthermore, some elements are present in the UNCLOS, as mentioned in the following part.

3. Space Activities and the Protection of the Marine Environment: a Perspective from the Law of the Sea

3.1 The United Nations Convention on the Law of the Sea: a Key Legal Instrument for Tackling Marine Pollution

Part XII of the UNCLOS deals specifically with the protection and preservation of the marine environment.[54] Article 192 provides that "States have the obligation to protect and preserve the marine environment". Article 194 highlights that "States shall take all measures consistent with this Convention that are necessary to prevent, reduce and control pollution of the marine environment from any source [...]".[55] In addition, para 2 mentions that "States shall take all measures necessary to ensure that activities under their jurisdiction or control are so conducted as not to cause damage by pollution to other States and their environment, and that pollution arising from incidents or activities under their jurisdiction or control does not spread beyond the areas where they exercise sovereign rights [...]". From these provisions there derives the obligation for states to protect the marine environment from the adverse effects of their activities, including any space activities and launches. States should

53 LTS Guidelines B.6 (4).

54 The legal regime of the law of the sea is consolidated by the High Seas Treaty agreed in March 2023. The agreement supports global collaboration to tackle the ocean's persistent threats like biodiversity loss, pollution and climate change. See Agreement under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ) (adopted on 19 June 2023) <https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXI-10&chapter=21&clang=_en> accessed 9 October 2023; 'UN delegates reach historic agreement on protecting marine biodiversity in international waters' (*UN News*, 5 March 2023) <https://news.un.org/en/story/2023/03/1134157> accessed 23 March 2023.

55 See Request for an Advisory Opinion Submitted by the Commission of Small Island States on Climate Change and International Law to the International Tribunal for the Law of the Sea (12 December 2022).

act with due diligence[56] by adopting appropriate measures to protect the marine environment[57] from their national activities in order to "minimize the release of toxic, harmful or noxious substances; pollution from vessels; pollution from installations and devices".[58] Para 5 of the Article 194 also emphasizes that measures adopted by states should encompass elements to protect and preserve rare or fragile ecosystems. Thus, states should include measures for the protection of marine environment in the launch authorization process.[59] In addition, they could introduce specific requirements concerning the protection of Earth environment and marine habitat in their national space legislation[60].

Article 194 specifies that the responsibility to adopt measures lies with the state that has 'jurisdiction or control' over the activities that may cause damage to the marine environment of other states. In accordance with Article 194, the state in whose territory the spaceport is located would maintain "jurisdiction or control" over spaceflight activities. This is in line with Article VI of the Outer Space Treaty, which confers international responsibilities on the "appropriate" State which must authorize and continuously supervise activities conducted by non-governmental entities in outer space. The duty to take appropriate measures to protect the marine environment thus also applies to spaceflight activities conducted by operators from the state's territory, from another state's territory or from the high seas.[61] States should take measures to preserve and safeguard marine environment during the launch and in the re-entry phase of space objects on Earth,[62] including space debris[63]. Furthermore, it is also important to obtain accurate information on space objects' return, as mentioned in the LTS Guidelines mentioned above.

Although UNCLOS does not specifically refer to pollution from spaceflights,[64] it covers all matters relating to the law of the sea and requires states to protect and preserve the marine environment against all forms of pollution, including launch and re-entry activities. Nevertheless, the adoption

56 Samantha Besson, *Due Diligence in International Law (The Hague Academy of International Law)* (Brill 2023).

57 Irini Papanicolopulu, 'Due Diligence in the Law of the Sea' in Heike Krieger, Anne Peters and Leonhard Kreuzer (eds) *Due Diligence in the International Legal Order* (Oxford University Press 2020).

58 Article 194 (3) (a) and (c) UNCLOS (n 17).

59 Joosung J. Lee, 'Legal analysis of Sea Launch license: National security and environmental concerns' (2008) 24 Space Policy 2, 104-112.

60 Annette Froehlich and Vincent Seffinga, *National Space Legislation – A Comparative and Evaluative Analysis* (Springer 2018).

61 Alla Pozdnakova (n 23) 7.

62 Carmen Pardini and Luciano Anselmo, 'Uncontrolled re-entries of spacecraft and rocket bodies: A statistical overview over the last decade' (2019) 6 Journal of Space Safety Engineering 1, 30-47.

63 See Vito De Lucia, 'Splashing down the International Space Station in the Pacific Ocean: Safe Disposal or Trashing the Ocean Commons?' (2022) EJIL: Talk! <www.ejiltalk.org/splashing-down-the-international-space-station-in-the-pacific-ocean-safe-disposal-or-trashing-the-ocean-commons/> accessed 22 March 2023.

64 The types of pollution covered under UNCLOS, is a longstanding debate. See Sen Wang, 'International law-making process of combating plastic pollution: Status Quo, debates and prospects' (2023) 147 Marine Policy; Gemma Andreone (ed), *The Future of the Law of the Sea* (Springer 2017); Donald Rothwell, Alex Oude Elferink, Karen Scott and Tim Stephens (eds), *The Oxford Handbook of the Law of the Sea* (Oxford University Press 2015); Elena M. Mc Carthy, 'International Regulation of Transboundary Pollutants: the Emerging Challenge of Ocean Noise' (2001) 6 Ocean and Coastal Law Journal 2, 257-292; Amy DeGeneres Berret, 'UNCLOS III: Pollution Control in the Exclusive Economic Zone' (1995) 55 Louisiana Law Review 6, 1165-1190; Alan E. Boyle, 'Marine Pollution under the Law of the Sea Convention' (1985) The American Journal of International Law, 79(2) 347-372; Colin M. De La Rue (ed), *Liability for Damage to the Marine Environment* (Lloyd's of London Press 1993).

of adequate measures by states is conditioned by the availability of data and scientific information concerning the effects of spaceflights on ocean environment.[65]

The UNCLOS' provisions provide some relevant elements to improve the sharing of information concerning the impact of spaceports' activities on the marine environment, such as research cooperation (Article 200), establishment of scientific criteria (Article 201), monitoring the risks or effects of pollution and publishing reports (Articles 204 and 205), and assessing the potential effects of activities on the marine environment (Article 206). These elements could be incorporated in standards on the protection of marine environments from spaceflight activities by taking into account all phases of launch. It is necessary to further develop a system of information sharing between states conducting spaceflights and states exposed to pollution resulting from space activities,[66] in conjunction with Article IX of the OST, which implies that states shall conduct their space activities with due regard to the corresponding interests of other states.

Following the wording of Article 204 "States shall [...] observe, measure, evaluate and analyse [...] the risks or effects of pollution of the marine environment. States shall keep under surveillance the effects of any activities which they permit or in which they engage in order to determine whether these activities are likely to pollute the marine environment". This provision recalls Article VI of the OST and the necessity of continuous supervision by the state on national space activity. With this in mind, the regulator could require an assessment of the risks and effects of pollution on marine environment in the launch authorisation.

Article 206 provides that "when States have reasonable grounds for believing that planned activities under their jurisdiction or control may cause substantial pollution of or significant and harmful changes to the marine environment, they shall [...] assess the potential effects of such activities on the marine environment [...]". In the space sector, states have to authorize activities conducted by private entities, including spaceflight operations,[67] and they have to conduct missions so as to avoid harmful contamination of outer space and adverse changes in the environment of the Earth.[68] One can think that there is a duty to conduct environmental impact assessment before carrying out a launch activity that its operator should undertake an assessment of environment effects (AEE)[69] of such space operation. EIA is introduced in national space legislation and some states require an EIA for launch activities as previously mentioned. UNCLOS also requires states to publish reports with the results of such an assessment or to communicate the results to a competent international organization[70].

65 Greenpeace (n 50): 'Lack of publicly available information on the types of engines and fuels used and the quantities and hazards of the materials expected to be jettisoned fundamentally limits any independent assessment of impacts'.

66 Alla Pozdnakova (n 23) 11.

67 OST, article VI.

68 OST, article IX.

69 Auckland Council affirmed that 'An AEE is a written statement which identifies the effects of your proposed activity or activities on the environment...' <www.aucklandcouncil.govt.nz/building-and-consents/resource-consents/prepare-resource-consent-application/Pages/assessment-of-environmental-effects.aspx> accessed 22 March 2023.

70 UNCLOS, article 205.

Lastly, Section 5 of Part XII UNCLOS addresses specific sources of marine pollution and details the general rules of Article 194. In particular, the section encourages states to adopt national laws and regulations to prevent, reduce and control pollution of the marine environment resulting in, for instance, dumping (Article 210), as well as pollution from or through the atmosphere (Article 212). Arguably, some of these provisions may provide a relevant normative basis to strengthen marine environmental protection from spaceflight pollution, for example, soft law instruments dealing with marine pollution resulting from spaceflight activities could be developed at an international level, and they could then be implemented at a domestic level through national space legislation. In addition, the recently adopted agreement under UNCLOS on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ Agreement)[71] also contains provisions on marine pollution and unsustainable use that could be introduced in future guidelines related to the protection of marine environment and space activities. Indeed, it recognises in its preamble that states have the obligation to assess the potential effects of their national activities on the marine environment. Finally, it reaffirms the obligation to conduct environmental impact assessments (Articles 28, 30), which constitute an element that could be introduced in national space legislation.

3.2 The Dumping Regime at Stake

The UNCLOS addresses the issue of dumping regimes[72] as a tool for tackling marine pollution. Article 1 (5) (a) of the UNCLOS defines "dumping" as (i) any deliberate disposal of wastes or other matter from vessels, aircraft, platforms or other man-made structures at sea; (ii) any deliberate disposal of vessels, aircraft, platforms or other man-made structures at sea; (b) "dumping" does not include: (i) the disposal of wastes or other matter incidental to, or derived from the normal operations of vessels, aircraft, platforms or other man-made structures at sea and their equipment, other than wastes or other matter transported by or to vessels, aircraft, platforms or other man-made structures at sea, operating for the purpose of disposal of such matter or derived from the treatment of such wastes or other matter on such vessels, aircraft, platforms or structures; (ii) placement of matter for a purpose other than the mere disposal thereof, provided that such placement is not contrary to the aims of this convention.

Article 210(1) of the UNCLOS requires "States to adopt laws and regulations to prevent, reduce and control pollution of the marine environment by dumping". States shall take measures to prevent, reduce and control pollution of the marine environment by dumping (para 2). With this in mind, some states have implemented policy and action plans for the preservation of marine environment as examined in section 4. They also provide data and information resulting from research on the spaceports' impact for environment and biodiversity.

Article 216 of the UNCLOS deals with the enforcement mechanisms with respect to pollution by dumping. It provides that "laws and regulations adopted in accordance with this Convention and

71See BBNJ (n 54).

72 Dumping is also regulated at the regional level by: (i) the 1974 Convention for the Protection of the Marine Environment of the Baltic Sea Area (22 March 1974); (ii) the 1976 Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (16 February 1976) and its Protocol; (iii) the 1992 Convention for the Protection of the Marine Environment of the North-East Atlantic (22 September 1992).

applicable international rules and standards established through competent international organizations or diplomatic conference for the prevention, reduction and control of pollution of the marine environment by dumping shall be enforced: (a) by the coastal State with regard to dumping within its territorial sea or its exclusive economic zone or onto its continental shelf; (b) by the flag State with regard to vessels flying its flag or vessels or aircraft of its registry; (c) by any State with regard to acts of loading of wastes or other matter occurring within its territory or at its off-shore terminals". One can assume that regulations regarding the protection of marine environment from spaceflight missions should be applied by the state where the spaceport is located, by the operator of the launcher, as well as by the State of registry[73] of the space objects in case of re-entry that might cause pollution on Earth's environment.

These rules are detailed in the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention)[74] and in the 1996 London Protocol75. Article III of the London Convention provides that "dumping" means "any deliberate disposal at sea of wastes or other matter from vessels, aircraft, platforms or other man-made structures at sea", or "any deliberate disposal at sea of vessels, aircraft, platforms or other man-made structures". Under the London Protocol, which updated the Convention,76 all dumping is prohibited, except for possibly acceptable wastes on the so-called "reverse list" (see Articles I and II of the Convention and Article 2 of the Protocol). The purpose of the London Convention is to control all sources of marine pollution and prevent pollution of the sea through regulation of dumping into the sea of waste materials. One solution might be a protocol to the Outer Space Treaty dealing specifically with the protection of marine environment to fill the existing gap in the field of spaceflight and marine habitat.

4. Path Forward in the Protection of Marine Environment: Interactions between Space Law and the Law of the Sea

International norms addressing the protection of the marine environment against pollution by dumping are in some ways pertinent and applicable to pollution caused by spaceflight. Indeed, marine dumping rules may be useful for regulating launch and de-orbited space objects operations, as well as for managing pollution caused by space objects released into the high seas.[77] Furthermore, the legal framework on marine dumping may also be relevant in governing pollution caused by spaceport activities within the maritime zones under jurisdiction of a coastal state, in particular in

73 Article VIII OST states that: 'A State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object...''; Article I (c) of the 1975 Convention on Registration of Objects Launched into Outer Space "the term "State of Registry" means a launching State on whose registry a space object is carried in accordance with article II'.

74 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (Adopted 13 November 1972, entered into force 30 August 1975) 1046 UNTS 120.

75 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Protocol) (adopted 7 November 1996, entered into force on 24 March 2006, as amended in 2006).

76Andrew Birchenough and Fredrik Haag, 'The London Convention and London Protocol and Their Expanding Mandate' in Aldo Chircop, Scott Coffen-Smout and Moira L. McConnell, *Ocean Yearbook Online* (Brill 2020) 255-278.

77 Vito De Lucia and Viviana Iavicoli (n 15) 379.

the case of spaceflight residues from launches of space objects from another state's territory falling into maritime zones under national jurisdiction of the coastal State.[78]

Pollution caused by spaceflights is not contained in the definition of dumping in UNCLOS and the London Convention. The current legal framework only covers dumping from ships, platforms or from aircraft at sea. The regime could be extended to space launch operations because launch vehicles and re-entry of space objects could be viewed as "aircraft" in a broad interpretation of the term.[79] It is worth considering the exclusion from the definition of dumping of the elimination of wastes or other materials "incidental to, or derived from, the normal operations of vessels, aircraft, platforms or other structures at sea and their equipment".[80] However, spaceflight pollution from launch activities is part of a normal operation[81] in the same vein as "operational" discharges from aircraft. There is a distinction between "deliberate" and "incidental" pollution, and consequently the current legal regime does not consider "pollution" from "normal operations". In addition, an accident during the launch phase that causes pollution is not covered by the legal framework because it could be considered an "incidental operation".[82]

With this in mind, this regime could be adapted to take into account the rise in space launch activities in order to include "operational" (or normal) pollution from dropped components of space objects and pollution by "incidental operation", thus enhancing the legal framework on the protection of the marine environment against pollution from space activities.[83] Based on the LTS guidelines previously mentioned, some standards could be developed considering elements of space law including, for instance, Articles VI and IX; as well as provisions of the law of the sea in the field of marine protection, EIA, data sharing and dumping.

Given the fact that the international legal framework does not specifically mention the preservation of marine environment from spaceflight activities, states on whose territories a spaceport is located on coastal areas have developed national policy and environmental plans for the preservation of marine habitats. In the next part, the paper considers some spaceports located near the sea[84] which represent recently established spaceports or historic ones: Cornwall in the United Kingdom, Andoya in Norway, Ahuriri Point in New Zealand, Kourou in French Guyana, and John F. Kennedy Space Center in Florida (USA).

78 Michael Byers and Cameron Byers, 'Toxic Splash: Russian Rocket Stages Dropped in Arctic Waters Raise Health, Environmental and Legal Concerns' (2017) 53 Polar Record 6, 580-591.

79Alla Pozdnakova (n 23) 9; According to the Oxford Dictionary, an aircraft represents 'any vehicle that can fly and carry goods or passengers' <www.oxfordlearnersdictionaries.com/definition/american_english/aircraft> accessed 22 March 2023.

80 London Protocol, article 2 (1).

81 Report of the Scientific Group of the London Protocol, 'Progress of the Correspondence Group on the Marine Environmental Effects of Jettisoned Waste from Commercial Spaceflight Activities' (March 2019) LC/SG 42/8/1.

82 Alla Pozdnakova (n 23) 10.

83Alla Pozdnakova (n 23) 13.

84 In Europe, Sweden is also developing its spaceport in Esrange. In the same vein, Portugal envision building a spaceport on the Azores islands.

5. Development of Policy and Environmental Plans at National Level

5.1 Spaceports Recently Established in the European Area

The United Kingdom is developing its space transportation industry, in particular with the establishment of its first operational launch site at Cornwall Airport.[85] In this context, in 2021 the Department for Transport issued *Guidance to the regulator on environmental objectives relating to the exercise of its function under the Space Industry Act 2018*, clarifying the government's environmental objectives relating to spaceflight and associated activities in the country.[86] The environmental objectives for spaceflight activities aim to: (i) minimise emissions contributing to climate change resulting from spaceflight activities; (ii) protect human health and the environment from the impacts of emissions on local air quality arising from spaceflight activities; (iii) protect people and wildlife from the impacts of noise from spaceflight activities; (iv) protect the marine environment from the impact of spaceflight activities.

The guiding document completes the 2011 Marine Policy Statement[87], updated in 2020, which provides for: (i) protection of marine ecology and biodiversity; (ii) consideration of impacts on air quality resulting from increased coastal activity; (iii) consideration of man-made noise sources and assessment of the potential cumulative effects of noise and vibration across sensitive receptors in the marine and coastal area, balancing these against the potential socio-economic benefits; (iv) consideration of impacts on water quality, quantity and physical modifications to the water environment; (v) taking into account the impacts of climate change on the marine environment (relative sea level rise, increased seawater temperatures, ocean acidification and changes in ocean circulation) over the lifetime of a project, facilitating adoption of mitigation measures.

The documents set a framework for taking actions while considering the main environmental effects of UK spaceflight activities, including[88]: (i) impacts of spaceflight emissions on climate change and on levels of ozone in the upper troposphere and stratosphere; (ii) impacts on local air quality around the spaceport; (iii) noise impacts on wildlife at the spaceports and under flightpaths; (iv) impacts on the marine environment from jettisoned objects, as well as coastal spaceports and launch activities.

Norway is currently building its spaceport in Andoya in the Barents Sea-Lofoten area and in this perspective the country is developing policy documents for the protection of the environment, an ocean management plan to limit pollution effects as well as the protection of the Arctic in terms of

85 See 'Spaceport Cornwall' <https://spaceportcornwall.com/> accessed 8 September 2023; Jemma-Anne Lonsdale and Claire Phillips, 'Space Launches and the UK Marine Environment' (2021) 129 Marine Policy.

86 Guidance to the regulator on environmental objectives relating to the exercise of its functions under the Space Industry Act 2018 (n 18).

87 UK Marine Policy Statement (adopted in 2011, updated in 2020) <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69322/pb3654-marine-policy-statement-110316.pdf> accessed 22 March 2023.

88 Guidance to the regulator on environmental objectives relating to the exercise of its functions under the Space Industry Act 2018 (n 18).

security, climate and environment[89]. Norway also integrated an ocean management plan[90] because the country has developed many activities that can affect marine life, including space activities. The plans take into consideration the fact that human activity, at sea and on land, puts pressure on marine ecosystems. There is a necessity to develop a comprehensive understanding of the cumulative impacts of all activities, as well as the need for more knowledge about ecosystem impacts of climate change, ocean acidification and underwater noise.[91]

5.2 Other Spaceports Worldwide

In French Guyana, at Kourou, home of the Europe's historic spaceport, the Guyana Space Center, the French space agency (CNES – *Centre National d'Etudes Spatiales*), in cooperation with the Center, has established a *Plan de Gestion de la Biodiversité du domaine du Centre Spatial Guyanais* (2021-2030).[92] This is an environmental policy that aims to examine, prevent and provide measures to limit the impact of spaceflight activities on Guyanese biodiversity, including marine environment. In addition, launch activities within the spaceport depend on the 2008 French Space Act,[93] as well as its implementing decrees[94]. The environmental impacts of launches are covered by an environmental measures plan (PME) with the following objectives[95]: (i) assessing the impact of a launch/test/burning on the environment; (ii) ensuring compliance with the requirements of the prefectural decree authorising the operation of the installation: measuring atmospheric concentrations of hydrochloric acid and aluminium chloride; measuring chemical and particulate deposition; assessing the impact on the quality of surface water; monitoring the impact on vegetation; (iii) confirming the conclusions of the impact study through the monitoring of aqueous and gaseous effluents; through the monitoring of water and soil quality. Lastly, a specific protocol and methodology are put in place for each launcher, including Ariane 5, Ariane 6 and Vega. So far, studies on these indicators show positive results with no particular environmental impact.

89 'The Norwegian Government's Arctic Policy' (2021) <www.regjeringen.no/no/dokumenter/arctic_policy/id2830120/> accessed 22 March 2023; see also Alla Pozdnakova, 'Space Infrastructure for a Sustainable Arctic: Opportunities and Challenges of Spaceport Development in the High North' (*The Arctic Institute*, 31 May 2022) <www.thearcticinstitute.org/space-infrastructure-sustainable-arctic-opportunities-and-challenges-spaceport-development-high-north/> accessed 22 March 2023.

90 Norwegian Ministry of Climate and Environment, 'Norway's integrated ocean management plans' (White Paper, 2019-2020).

91 ibid.

92 CNES, 'Plan de Gestion de la Biodiversité du Centre Spatial Guyanais' (2021-2030) <https://cnes.fr/sites/default/files/drupal/202102/default/plan_de_gestion_t1_161220.pdf> accessed 22 March 2023.

93 Loi n° 2008-518 du 3 juin 2008 relative aux opérations spatiales (JORF n° 0129 du 4 juin 2008).

94 Arrêté du 23 février 2022 relatif à la composition des trois parties du dossier mentionné à l'article 1er du décret n° 2009-643 du 9 juin 2009 relatif aux autorisations délivrées en application de la loi n° 2008-518 du 3 juin 2008 modifiée relative aux opérations spatiales (JORF n° 0048 du 26 février 2022); Décret n° 2022-233 du 24 février 2022 modifiant le décret n° 2009-640 du 9 juin 2009 portant application des dispositions prévues au titre VII de la loi n°2008-518 du 3 juin 2008 relative aux opérations spatiales (JORF n° 0047 du 25 février 2022); Décret n° 2022-234 du 24 février 2022 modifiant le décret n° 2009-643 du 9 juin 2009 relatif aux autorisations délivrées en application de la loi n° 2008-518 du 3 juin 2008 relative aux opérations spatiales (JORF n° 0047 du 25 février 2022).

95 Célie Losada, 'Synthèse des mesures environnementales au CNES/CSG' (*SPPPI,* 18 January 2018), <www.guyane.developpement-durable.gouv.fr/IMG/pdf/annexe_6_-_presentation_cnes_-_bilan_pme.pdf> accessed 6 November 2023.

In the United States, one of the first policy documents[96] dealing with space launches and environment was NASA's Final Constellation Programmatic Environmental Impact Statement (PEIS),[97] adopted in 2008 regarding potential environmental impacts at US Government facilities. Chapter 4 on "Environmental Consequences of Alternatives" deals with the John F. Kennedy Space Center in Florida, which also represents a historic launch site in the United States. The document focuses on water resources and the impacts of launch noise on wildlife, as well as biological impacts of launch area accidents and potential impacts on ocean environment[98], providing information on impacts of un-burned propellant on the ocean environment.[99]

The policy highlights the potential impacts of space launches on ocean environment. The predominant impacts of an early ascent accident or mission abort on the ocean environment would be due to unspent fuel and unrecoverable accident debris. The magnitude of the impact would depend on the physical characteristics of the materials (e.g. size, composition, quantity) and the physical oceanography of the impact region. The policy indicates that it is unlikely that launcher fragments will fall on a marine mammal due to the extent of the open ocean and the relatively low density of marine mammals on the surface waters of open ocean areas.

US regulation[100] and policy[101] provide elements for the protection of marine environment in case of launch accidents,[102] negative impacts during the re-entry of modules in the Pacific Ocean,[103] as well as environmental compliance.[104]

In New Zealand, the Wairoa District coastline is home to Rocket Lab Launch Complex 1, the world's first and only private orbital launch site.[105] Consequently, there are now more frequent launches and space objects re-entering to Earth. There is therefore a need for further research on the cumulative effects that these space activities have on air, land and sea. With regard to the assessment of impacts on the maritime domain, there is the issue of rocket launch debris, and the consequences that launch and debris have on marine environment. Between 2016 and 2017, the National Institute of Water and Atmospheric Research (NIWA) released two reports: (i) the Marine ecological risk assessment of the

96 Other documents: NASA Policy Directive 8500.1B: NASA Environmental Management ; NASA Procedural Requirements 8553.1B: NASA Environmental Management System; NASA Procedural Requirements 8570.1: Energy Efficiency and Water Conservation; NASA Procedural Requirements 8580.1: Implementing The National Environmental Policy Act And Executive Order 12114; NASA Procedural Requirements 8590.1: NASA Environmental Compliance and Restoration (ECR) Program; Title 40 of the Code of Federal Regulations: Protection of Environment (Chapter I, subchapter H "ocean dumping").

97 'NASA's Final Constellation Programmatic Environmental Impact Statement (PEIS)' (*NASA,* 2008) <www.nasa.gov/pdf/207909main_Cx_PEIS_final.pdf> accessed 22 March 2023.

98 ibid, 4-29.

99 ibid, 4-96.

100 See the 1972 Marine Mammal Protection Act (MMPA).

101 See Federal Aviation Administration (FAA), 'Final Environmental Assessment for the SpaceX Starship and Super Heavy Launch Vehicle at Kennedy Space Center' (KSC) (19 September 2019).

102 NASA's Final Constellation Programmatic Environmental Impact Statement (PEIS) (n 97), 4-16.

103 ibid, 4-103.

104 ibid, 4-121.

105 Rocket Lab <www.rocketlabusa.com/launch/launch-with-us/> accessed 22 March 2023.

cumulative impact of electron rocket launches;[106] (ii) the ecological risks assessment of the impact of debris from space launches on the marine environment.[107] The report recognised that direct strike of debris can cause mortality of seabirds and marine mammals, cause noise disturbance, toxic contaminants, the risks of ingestion of debris and the smothering of seafloor organisms.[108] Thus, the report provides a classification of ecological risk.[109] Furthermore, prior to any space launches occurring in New Zealand with the potential to deposit material in the waters of the EEZ, the government undertook an environmental risk assessment[110] of the proposed activity in order to determine the level of risk associated with the activity and to mitigate them. Given the very little information about the impacts of this activity, and the uncertainty about if and where the debris will fall on the seabed, New Zealand chose a precautionary approach and placed a limit on the amount of launches to undertake before a review of the regulations (100 in total).[111] This is a trigger for the environmental effects to be reconsidered so that the regulatory approach can be modified if necessary.

6. Conclusion – Implementing Norms in the Legal Framework dealing with Marine Pollution and Spaceflight Activities

So far, the space legal framework and international environmental law do not adequately regulate state responsibility for spaceflight activities and their impact on marine habitat.

Pollution of the marine environment by spaceflights is not yet perceived by the space community as a problem requiring the adoption of specific measures, probably due to the lack of data and information on the short and long-term effects of space launches on the oceans. This can be explained to some extent by the lack of specific environmental expertise within the UNCOPUOS, the leading international forum to discuss issues on space law and cooperation in space activities[112]. These issues must be addressed in a coordinated and holistic approach considering legal regimes, as well as the fragility of marine environment and the long-term sustainability of space activities. One possible option could be to add an agenda item to the work of one of the subcommittees; alternatively, to initiate debate on the impact of space transportation and spaceflights on Earth's environment, especially on the ocean habitats, within the agenda items of the Scientific and Technical Subcommittee or within the Legal Subcommittee.

At the international level, the integration of environmental law norms into the space law regime

106 New Zealand Ministry of Environment, 'Marine Ecological Risk Assessment of the cumulative impact of Electron Rocket launches' (*NIWA,* 2016) <https://environment.govt.nz/assets/Publications/Files/NIWA-marine-ecological-risk-assessment-of-the-cumulative-impact-of-space-rocket-launches_0.pdf> accessed 22 March 2023.

107 New Zealand Ministry of Environment, 'Ecological Risk Assessment of the impact of debris from space launches on the marine environment' (*NIWA,* April 2017) <https://environment.govt.nz/assets/Publications/Files/Ecological-Risk-Assessment-of-the-impact-of-debris-from-space-launches-on-the-marine-environment.pdf> accessed 22 March 2023.

108 ibid, 17 ss.

109 ibid, 26 ss.

110 New Zealand Ministry of the Environment Regulatory Impact Statement: Regulation of deposit of jettisoned material from space vehicle launches under the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (3 April 2018), 8.

111 ibid, 12.

112 David Kendall and Gérard Brachet, 'COPUOS: Current and Future Challenges' (2023) 48 Air&Space Law, 7-18.

is still at an initial stage. There is a need to develop a more comprehensive international framework to address the impact of spaceflight on the environment, and in particular the marine environment, as more and more spaceports are established on coastal areas. Furthermore, a common approach should be determined for the conduct of an environmental impact assessment before carrying out spaceflight activities.

In this context, debates on spaceflight activities, pollution and marine environment protection should be extended within the UNCOPUOS, and it should a mandate should be given to the Committee to further discuss, along with the International Maritime Organisation (IMO),[113] the question of the protection of the marine environment. Space institutions could take advantage of the lessons learnt in this field from maritime organisation and from states' practice with the organisation of workshops or the sharing of data and information on the consequences of launch activities on marine habitat. Given that the current space legal framework is limited in this regard, it is necessary to consider some elements from the law of the sea and to extend the dumping regime to launch activities located in coastal areas or at sea.

It may also be feasible to adjust and adapt the existing regulatory and institutional framework for spaceflight activities, considering the pollution of coastal areas near spaceports, by expanding the marine dumping regime to space activities through the adoption of an additional protocol to the Outer Space Treaty, or otherwise developing international standards with the consensus of governments whose jurisdiction coastal launch pads and operators come under.

At the national level, states are adopting policies and environmental plans to limit the pollution of marine areas around spaceports, including by providing relevant data and sharing information, as is also mentioned in the 2019 Long-term Sustainability Guidelines. Where spaceports are located on coastal areas, the regulator should ensure that a marine environment assessment be submitted as part of a launch operator authorisation, pursuant to Article VI of the OST, considering the likely impacts of spaceflight on the coastal environment, as well as proposals to mitigate these impacts by taking into account the nature of dumping and space debris, their trajectories and whether there are nearby protected marine areas.

113 UNGA Report of the Committee on the Peaceful Uses of Outer Space, Sixty-second session (12-21 June 2019), A/74/20: '309. The Committee agreed that the Office for Outer Space Affairs should liaise with the secretariat of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter and its 1996 Protocol, at the International Maritime Organization, on matters relating to the effects on the marine environment of waste jettisoned from commercial spaceflight activities and report on the status of those matters to the Committee at its sixty-third session, in June 2020. In that regard, the Committee noted that it was the responsibility of member States to liaise and coordinate nationally with their respective authorities and departments responsible for the processes under those intergovernmental bodies'; see also Committee on the Peaceful Uses of Outer Space Marine environmental effects of jettisoned waste from commercial spaceflight activities (17 June 2019) A/AC.105/2019/CRP.11.

Maritime Safety and Security Law Journal

Towards a Maritime Security Governance Framework in the Gulf of Guinea

*Frederick BOAMAH**

Abstract

The significance of the ocean in terms of its economic potential is well established, however, it is plagued with many threats and challenges which call for a proper examination of its management and governance. This paper examines the legal and institutional frameworks at the global, regional, sub-regional, and national levels for governance of the oceans and its resources in the Gulf of Guinea (GoG). It further reviews the existing cooperative arrangements in the GoG using regime theory of international relations. Findings show that though, several arrangements exist at the international and regional levels with binding and enforceable provisions which are applicable in the GoG, their implementation and enforcement is lacking in the GoG. On the other hand, sub regional arrangements lack clearly defined binding character leading to uneven implementation at the national level. The paper makes a case and recommends that perhaps the national and sub regional arrangements constitute a developing regime cluster and ought to be evaluated in that frame.

Keywords: maritime security, Gulf of Guinea, governance framework, maritime domain, piracy, international law, national efforts

First published online: 23 May 2024

1. Introduction

The world's oceans over the years have gained considerable relevance as they cover about 70% of the earth's surface and provide support for socio-economic growth and the development of states.[1] Coastal and island states worldwide are concerned about the management of their maritime spaces and events within them.[2] This is as a result of the economic opportunities the oceans present as a repository of valuable natural resources and as a gateway

* Research Fellow at the Legon Centre for International Affairs and Diplomacy. His research interests cover maritime security, maritime boundary disputes and diplomacy, natural resource management and climate change as well as Migration and ethics.

1 The oceans provide a source of livelihood for many people through fishing, shipping and logistics, exploration of hydrocarbons and petroleum resources as well as the exploitation of mineral resources and provision of leisure.

2 Articles 56, 57 and 58 of UNCLOS.

to the global supply chain with an estimated 80 percent of the volume of world trade carried by sea.[3] Africa as a continent has come to terms with the fact that the continent's socio-economic advancement cannot be separated from effective and efficient management of its maritime environment (the blue economy). This recognition is predicated on the fact that Africa's coastline covers over 26,000 nm, with thirty- eight (38) out of the fifty-four (54) African countries being coastal or islands (AIMS 2050).

The Gulf of Guinea (GoG) provides economic opportunities to both coastal and landlocked states and it is of strategic importance to global trade and international shipping.[4] The seamless flow of global goods and services to ports within the region, in addition to the vital resources in its waters, is critical for global energy production and transportation.[5] The GoG is also crucial to West Africa's fishing industry and provides employment and means of sustenance for a large percentage of the indigenous population.[6] It also offers vast mineral resources and commercially valuable marine life which are integral to the global trade network, justifying the need for maritime security and safety at all times (ibid). Despite the opportunities presented by the GoG, it is plagued with maritime instability and insecurity, emanating from weak governance, and leading to organised crime, such as illegal fishing, drug smuggling, human trafficking, money laundering and piracy. It has been argued that a common maritime security strategy is the requisite tool to successfully fight criminal activities in the GoG. Additionally, it has been proposed that policies must be framed within national and regional levels, extending beyond immediate needs and reactive engagements.[7]

In this light, several maritime security frameworks and agreements have been rolled out to combat emerging and existing threats and, most importantly, to safeguard the blue economy of Africa. This paper critically evaluates the effectiveness of regional and national frameworks designed to address maritime insecurity in the GoG.

---

3 United Nations Conference on Trade and Development (UNCTAD), *Review of Maritime Transport* (United Nations 2016).

4 'Key Political Risk in the Gulf of Guinea' (2012) Reuters <www.reuters.com/article/2012/02gulfofguinea-risks-idAFL5E8D73CZ201210?sp=true> accessed 10 January 2023.

5 Kaija Hurlburt and others, 'The Human Cost of Maritime Piracy 2012' (2012) Oceans Beyond Piracy <http://oceansbeyondpiracy.org/sites/default/files/hcop2012forweb.pdf> accessed 30 December 2022.

6 Bem I. Garba, 'Ocean Governance and Maritime Security in the Gulf of Guinea' (2020) CIMSEC <https://cimsec.org/ocean-governance-and-maritime-security-in-the-gulf-of-guinea/> accessed 15 January 2023.

7 'Ninth International Forum on Illegal, Unreported and Unregulated Fishing' (9th International Forum, London, February 2016) Chatham House <www.chathamhouse.org/sites/default/files/events/2016-02-15-9th-illegal-unreported-unregulated-fishing-forum-meeting-summary.pdf> accessed 29 December.

2. Protecting the African maritime domain: overview of continent-wide approach

The Gulf of Guinea (GoG) represents a significant portion, around 25%, of African maritime traffic and boasts close to 20 commercial seaports. It has a substantial share, approximately 60%, of Africa's oil production, along with 4.5% of the world's confirmed oil reserves and 2.7% of proven natural gas reserves.[8] Regional corruption, widespread unemployment and lack of good governance remain important push factors that have culminated in a surge in illicit activities in the GoG, and more particularly, further exacerbating existing transnational trafficking issues.[9] The limited capacity of the GoG states to combat these threats, coupled with the complex array of challenges, severely hampers efforts to create a blue economy in the African Maritime Domain (AMD). Therefore, it is imperative and urgent to adopt a continent-wide approach to tackle maritime insecurity in the region. AMD ultimately holds the key to poverty alleviation and job creation by ensuring that the resources of the sea are harnessed for the benefit of the people. However, the potential of AMD is grossly undermined by a plethora of challenges including piracy, transnational organised crimes and IUU fishing, among others (ibid). The 2050 AIM Strategy was therefore developed as an antithesis to the maritime challenges that confronted the continent. The strategy seeks to promote wealth creation from Africa's maritime space by developing a sustainable flourishing economy in an environmentally sustainable and secured manner.

The 2050 AIM Strategy adopts a coherent and coordinated action towards the management of the maritime space for the sustainable development of the continent, and sets a common template to guide maritime review, budgetary planning, and effective resource allocation to improve maritime viability for a prosperous Africa. The implementation of this continent-wide initiative is wrought with challenges that impedes the actualisation of the overarching goal. For instance, the Strategic Task Force (STF) is mandated to produce and fast track a roadmap for the implementation of AIMS 2050 and to bring the strategy in conformity with international law. Nonetheless, the STF has consistently been unable to meet to devise a roadmap for AIMS 2050.[10] It is important to note that STF's ineffectiveness is predicated on the failure to reach a quorum.[11] Indeed, findings

8 Pierre Morcos, 'A Transatlantic Approach to Address Growing Maritime Insecurity in the Gulf of Guinea' (2021) Center for Strategic and International Studies <www.csis.org/analysis/transatlantic-approach-address-growing-maritime-insecurity-gulf-guinea> accessed 22 January 2024.

9 David Glass, 'Cyprus shipping concern over 'gravely dangerous' Gulf of Guinea situation' (2021) Seatrade Maritime <www.seatrade-maritime.com/piracy/cyprus-shipping-concern-over-gravely-dangerous-gulf-guinea-situation> accessed 20 January 2024.

10 Hurlburt (n 5).

11 Garba (n 6).

reveal that the first meeting originally scheduled in October 2014 was held in July 2015, due to failure to form a quorum, and the July 2015 meeting saw the participation of only 7 states and one representative of a Regional Economic Community (REC).[12]

Additionally, the African Charter on Maritime Security and Safety Development in Africa (Lomé Charter or ACMSSDA) was adopted on 15th October 2016. [10] The Charter requires member states to perform their obligations in good faith and to ensure utmost security and welfare for its citizenry. The Lomé Charter reinforces the need for effective information sharing and communication as a basis for easy maritime governance. Chapter 4 of the Charter also places importance on the development of the blue economy, requiring that state parties develop policies aimed at streamlining the exploitation of their marine resources, such as fisheries and aquaculture. The Charter has also seen quite a few challenges in its implementation. As of September 2019, out of 55 countries, only 35 have signed the Charter, with only 2 countries having ratified, while 2 countries have deposited it. This clearly highlights a plausible failure in the implementation status of the Charter after six years of its promulgation. Although chapter 4 of the Charter places emphasis on capacity building, it appears that beyond the textual commitment to boost capacity there is little to nothing being done to achieve that goal. There seems to be little knowledge on the opportunities in the Africa Maritime Domain and a low level of awareness of the potential the maritime domain possesses It could be inferred that the continent of Africa suffers from sea blindness and is in short supply of professionals in the maritime field.[13]

3. Regional Responses to Piracy in the GoG

The burgeoning effects of the threat posed by piracy has culminated in several regional institutional arrangements geared towards addressing piracy in the GoG. One key institution is the Gulf of Guinea Commission (GGC), established in 1999 by eight countries, seven of which were oil producing countries. Ghana became the nineth member in 2016.[14] The primary objective of the GGC is to strengthen cooperation and peace among members and, most importantly, to promote the well-being and economic development of member states. The GGC also enjoins member states to harmonize their respective policies in the areas of shared interest, such as peace and secu-

12 Chatham House (n 7).

13 Mario Simões-Marques, Amindo Frias and Pedro B. Água, *Human factors impact in the security and safety of the maritime domain* (Springer, 2021).

14 Katja L. Jacobsen and Johannes. R. Nordby, *'Maritime Security in the Gulf of Guinea'* (Royal Danish Defence College Publishing House 2015).

rity, fishery, exploitation of hydrocarbons and mineral resources among others.[15]

Additionally, there is the Maritime Organization for West and Central Africa (MOWCA) – a successor institution to the Ministerial Conference of Marine Transport of West and Central African states (MINCONMA).[16] MOWCA is made up of 25 states, however, its large number has failed to garner any political gravitas. Through collaboration with relevant national, regional, and international bodies, MOWCA seeks to develop a cost-effective maritime transport service with safety standards to protect the marine environment. MOWCA's cooperative strategy in pursuing good order at sea became more apparent in 2008 when it collaborated with the IMO on the creation of a sub-regional Integrated Coast Guard Network (SICGN) for Western and Central Africa to improve maritime security.[17] The SICGN was aimed at improving search and rescue, and at preventing piracy in general. It also sought to combat marine pollution and illegal immigration, as well as to protect the marine environment from unauthorised exploitation of identified natural resources.[18] Nonetheless, the SICGN is yet to be implemented by any state.

Similarly, maritime strategies have been devised by each regional economic community; the Economic Community of Central African States (ECCAS) and the Economic Community of West African States (ECOWAS). It is important to note that ECCAS and ECOWAS were formed purely to advance regional economic cooperation in Central and West Africa respectively and did not focus on maritime security from its inception. However, in response to the rise of maritime security challenges, the Integrated System for Maritime Security (ISMS) and the ECOWAS Integrated Maritime Strategy (EIMS) were established in the ECCAS and ECOWAS sub-regions respectively.[19] The ECCAS-ISMS is built on six pillars; community surveillance through detection and sharing of assets, information management, harmonization of legal and institutional frameworks of states, institutionalized maritime conference in central Africa, self-financing through community tax and logistics provision. The EIMS, on the other hand, was primarily developed to create awareness and regulate the maritime space by preventing and combating maritime threats in West Africa.[20] The zonal approach is advanced by each sub-region to counter maritime threats.

15 Treaty establishing the Gulf of Guinea Commission [July 2001].

16 The Memorandum of Understanding (MoU) on the Establishment of a Sub-Regional Integrated Coast Guard Function Network (the IMO/MOWCA MoU) (July 2008).

17 International Hydrographic Organization <https://legacy.iho.int/mtg_docs/circular_letters/french/2015/LC85F.pdf/> accessed 15 January 2022.

18 Bamidele M. Shafa, 'Maritime Security in the Gulf of Guinea Sub-region: Threats, Challenges and Solutions' (Dissertation, US Army War College 2011).

19 Adeniyi A. Osinowo, 'Combating Piracy in the Gulf of Guinea' (2015) 30 Africa Security Brief 1.

20 ECOWAS Integrated Maritime Strategy (EIMs) (August 2014).

ECCAS has divided its maritime space into zones A and D, with each zone under the supervision of the Centre for Multinational Coordination (CMC), which is also under the Regional Centre for Maritime Security in Central Africa (CRESMAC), located in Pointe-Noire, Congo (ibid). Likewise, the EIMS divides the maritime space into three zones (E, F and G) with each zone equipped with its own monitoring and enforcement mechanism, known as the Multilateral Coordination Centre (MCC). Zone E covers Nigeria, Benin, Togo, and Niger. Zone F comprises Ghana, Cote d'Ivoire, Liberia, Sierra Leone, Guinea, and Burkina Faso, while Zone G covers Senegal, Cape Verde, the Gambia, Guinea Bissau, and Mali. A Maritime Regional Centre (MRC) established in Cote d'Ivoire coordinates the activities of the three zones. Regrettably, most of the zonal structures are still non-operational.

3.1. The Yaoundé Code of Conduct, 2013

The intensity of piratical attacks along the GoG stimulated the need to establish an effective framework to combat piracy and other illegal maritime activities in Western and Central Africa. In this light, a new regional anti-piracy framework was adopted and titled the Code of Conduct concerning the Prevention and Repression of Piracy, Armed Robbery against ships and Illegal Maritime Activities in West and Central Africa (Yaoundé Code of Conduct or YCoC).[21] The Cotonou conference also saw the adoption of two key documents: the ECCAS/ECOWAS Political Declaration on Illegal Maritime Activities in the GoG, and the Memorandum of Understanding between ECOWAS, ECCAS and GGC on Maritime Security in West and Central Africa.

The legal basis for the development of the new Code was in response to the United Nations Security Council Resolutions 2018 (UNSC 2011)[22] and 2039 (UNSC 2012)[23]. The UNSC recognised the need for adopting 'a comprehensive approach led by the countries of the region to counter the threat of piracy and armed robbery at sea in the GoG and their underlying causes. More so, the resolutions recognised the need to build an 'existing national, regional and extra-regional initiative to enhance maritime safety and security in the GoG.' A decade after the UNSC resolutions, the Security Council has yet again adopted a new resolution to stem the increasing tide of

21 Code of Conduct concerning the Repression of Piracy, Armed Robbery against Ships, and Illicit Maritime Activity in West and Central Africa (June 2013) (YCoC) <https://cggrps.com/wp-content/uploads/DECLARACAO-DE-YAOUNDE-EN.pdf/> accessed 1 January 2023.

22 UN Security Council resolution 2018 on acts of piracy and armed robbery at sea off the coast of the States of the Gulf of Guinea (2011) UN Doc S/RES/2018(2011).

23 UN Security Council resolution 2039 on acts of piracy and armed robbery at sea off the coast of the States of the Gulf of Guinea (2012) UN Doc S/RES/2039(2012).

maritime insecurity in the GoG,[24] raising questions about the effectiveness of existing responses.

3.1.1. The Yaoundé Code of Conduct and International Law

The character of maritime insecurity in the GoG is complex and thus requires a comprehensive framework responsive to the complexities at stake. The YCoC is not only designed to deal with piracy and armed robbery against ships but also includes illicit maritime activities set out in article 1(5) under a list of what is termed as transnational organised crime in the maritime enclave. For piracy, the Code adopted the same definition as expounded by article 101 of UNCLOS and the Djibouti Code of Conduct (DCoC). Article 1(3) of the YCoC maintains that an act constitutes a crime of piracy if it is (a) an illegal act of violence or detention, (b) committed for private ends, that is activities not sanctioned by states, (c) against another ship, person, or property in a place outside the jurisdiction of any state and (d) committed on the high seas. Similarly, the Code also accepts the definition of armed robbery as set out in the IMO Code of Practice for the Investigation of Crimes of Piracy and Armed Robbery against ships. Additionally, the wording of the Code on the duty to cooperate mirrors article 100 of the UNCLOS and adopts similar principles as enshrined in the DCoC. Under article 2 of the YCoC, the signatories declared their intention to cooperate '*to the fullest possible extent*' to tackle the maritime challenges.

Another key feature of the Code is that each state commits to share information regarding piracy attacks in the region. States are thus required to designate a national focal point and to declare and communicate it to other signatories at the time of signing the Code, or within a reasonable time thereafter.[25] Article 13(2) of the SUA Convention also imposes similar obligations on all states to cooperate to prevent the commission of offences by taking appropriate measures, including the exchange of information and the coordination of administrative and other measures. The rationale for the uniform reporting criteria is expressed in article 123 of YCoC and it is expected to 'ensure an accurate assessment of the threat of piracy and armed robbery in the West and Central Africa'.

It is important to note that the scope of the enforcement in YCoC is in line with the powers recognised under the UNCLOS. To repress piracy, each signatory, to the fullest possible extent, is to cooperate in the arrest, investigation and prosecution of persons who have committed the crime of piracy. Again, each state has the power to seize pirate ships and rescue ships, persons, and property subject to piracy. The only point of departure between the YCoC and UNCLOS on

24 UN Security Council resolution 2634 Adopted by the Security Council at its 9050th meeting (2022) UN Doc S/RES/2634 (2022).

25 YCoC (n 21) Article 11(3).

the powers of enforcement is the right of hot pursuit. Whereas article 111 of UNCLOS confirms the right of a state to undertake hot pursuit of a foreign ship when the competent authorities of the coastal have good reason to believe that the ship has violated the laws and regulations of that state, article 6(3) of YCoC reiterates that any pursuit of ships extending in and over the territorial sea of a signatory is subject to the authority of that signatory, and that no signatory should pursue such a ship in or over the territorial sea of any coastal state without the permission of that state.

3.2. Inter-Regional Coordination Centre (ICC) and Code of Conduct

Following the two UN Security Council resolutions 2018 and 2039, calling on the states of the GoG to take steps to deal with the piracy menace, the states of the region, together with its international partners, began the journey to form the ICC in 2013. To this end, the 2013 heads of state meeting in Yaoundé adopted a code of conduct and an action plan to coordinate the effort of the sub regional economic groupings, ECOWAS and ECCAS in collaboration with GGC. To this end the heads of state and governments of the GoG signed the Yaoundé Declaration, as well as the Code of Conduct. Figure 4.1 presents the GoG maritime security architecture and the administrative structures that underly its operation.

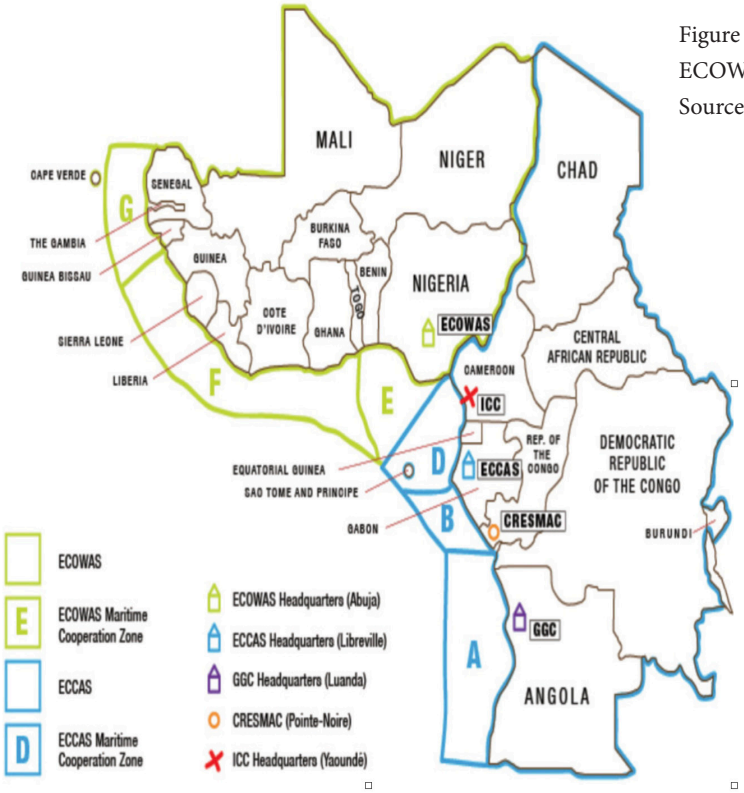

Figure 4.1 Maritime Securit Zones in ECOWAS and ECCAS sub-regions. Source: Osinowo, 2015.

To better appreciate Figure 4.1, it is important to note that the three regional bodies, the ECOWAS, ECCAS and the Gulf of Guinea Commission, form the highest administrative organ of the architecture. They come together to hold annual meetings called the Heads of Institution Meetings. Leadership of these meetings rotates between ECOWAS and ECCAS, because they contribute to the day-to-day running of the centre. Then the next level is called the strategic level, which is the Inter-Regional Coordination Centre Level. At this level, the ICC's role is to coordinate the policies of ECOWAS and ECCAS.

Below the ICC, are the two (2) Regional Centres. The regional centre in the ECCAS region is called CRESMAC (in Pointe Noire, in Republic of Congo). Whereas CRESMAO (in Abidjan) is for ECOWAS region. For effective coordination of maritime activities, these two (2) regional bodies have been sub-divided into sub-regional bodies or zonal centres. Under the ECCAS Regional Centre, there are two (2) Zonal Centres, classified as Zone A and Zone D. Within the ECOWAS region, there are three (3), E, F and G. Put together the GOG has zones A, D, E, F and G. The countries have been put in groups of three (3), four (4) or five (5) states under each of these zones. In the zonal arrangements, the coastal states are included as a priority and the landlocked states are then integrated among the zones, so that at least they would all be involved in the Gulf of Guinea project. Therefore, Zone A comprises Angola, Democratic Republic of Congo, Burundi, and Congo, with the centre in Luanda, Angola. Zone D comprises Cameroon, Gabon, Equatorial Guinea, Chad, Central African Republic and Sao Tome and Principe, with the centre in Douala, Cameroon. Zone E comprises Benin, Nigeria, Togo, and Niger, with the centre in Cotonou, Benin. Zone F comprises Ghana, Cote D'Ivoire, Liberia, Burkina Faso, and Sierra Leone, with the centre in Ghana. Zone G comprises Senegal, Guinea, Guinea Bissau, Gambia, Cape Verde, and Mali, with the centre in Praia, Cape Verde.

3.3. Sub Regional Fisheries Arrangements

In recognizing the importance of the fisheries sector to the GOG, states of the region have organised themselves into two fishery groupings, namely the Sub Regional Fisheries Commission (SRFC) based in Dakar, Senegal, and the Fisheries Committee for West Central Gulf of Guinea (FCWC) based in Tema, Ghana. Membership of the SRFC include Cape Verde, Gambia, Guinea, Guinea Bissau, Mauritania, Senegal, and Sierra Leone. The mandate of the commission is to strengthen regional cooperation to enhance the sustainable management of fishery resources in maritime waters under the jurisdiction of member states. The fishing sector is estimated to contribute US$1.5 billion per year to the economies of the states of the region and employs about

1million people.[26] The SRFC operates with the Convention on the Minimal Conditions for Access to Marine Resources (known as MCA Convention) which amends the Convention of 14th July 1993 on the Determination of the Minimal Conditions for Access and Exploitation of Marine Resources within the Maritime Areas under Jurisdiction of the Member States of the SRFC to regulate the minimal access conditions for foreign vessels to marine resources of member states of the SRFC. The convention further ensures that artisanal fisheries are protected; maritime safety and the protection of the marine environment; implementation of the 2001 International Action Plan to prevent, deter and eliminate IUU fishing and the 2009 Agreement on Port State Measures (ibid).

The FCWC, on the other hand, facilitates cooperation in fisheries management between its member states, namely Liberia, Côte d'Ivoire, Ghana, Togo, Benin, and Nigeria. In terms of its legal framework, the committee is guided by the 2006 Ministerial Declaration of Abidjan, which established the Committee; the adoption of the 2007 Cotonou Convention, establishing the Committee; the adoption of the structure of the Secretariat and a permanent funding mechanism to support the Committee's activities in 2008 and; the 2009 Ministerial Declaration of Accra, combating illegal fishing and adoption of the regional action plan against illegal fishing.[27]

4. Assessments of national response to piracy

Although, both international and regional legal frameworks underscore the need for a concerted approach in combating piracy, the primary responsibility to eradicate and clamp down on piratical activities lies with the state, as noted in the UNCLOS and SUA. By virtue of this fact, it is the responsibility of the states to build national capacities through the legislation of anti-piracy laws. Like the regional framework discussed above, countries in the GoG have devised national, bilateral, and multilateral strategies, such as beefing up security and deploying Special Forces to piracy prone areas.[28]

4.1. Nigeria

Undoubtedly, piratical attacks in the GoG are largely situated in Nigerian waters; a develop-

26 FAO, 'Regional Fishery Bodies Summary Descriptions SRFC' <www.fao.org/fishery/rfb/srfc/en/> accessed 15 January 2023.

27 Fisheries Committee for West and Central Gulf of Guinea (FCWC) <https://fcwc-fish.org> accessed 26 December 2022.

28 Sayed M. Hasan, 'The adequacies and inadequacies of the piracy regime: A Gulf of Guinea perspective' (DPhil thesis, University of Western Sydney 2014).

ment arising out of the enormous resources that lie off the cost of Nigeria. In 2010, the International Maritime Bureau counted 34 incidents, including the kidnapping of 44 crew members. Hasan emphasizes that much of the piratical activities in the GoG arise from the proliferation of insurgency and instability in Nigeria. In this regard, the piracy issue in GoG is fundamentally a Nigerian problem and must be tackled from the root.[29]

To manage the developing problems arising from piratical attacks, on 25th June 2009, the government of Nigeria offered unconditional amnesty to militants responsible for the problems in and around the Niger Delta.[30] The idea of the wholesome grant of amnesty was intended as a strategy to pacify the insurgents. The amnesty programme came along with monthly allowances and vocational training for militants, but it was short-lived following the death of then President Yar'Adua.[31] The slow pace of reintegration and the uneven disbursement of allowances failed to restore peace and security and, on the contrary, facilitated incessant piracy attacks.

In response to this, the Nigerian government established a Joint Task Force comprising the Army, the Navy and paramilitary agencies. In January 2012, the Nigerian government dissolved its Joint Task Force (Operation Restore Hope), established to address piracy and insurgency around the Nigerian Delta, and replaced it with the Joint Task Force (Operation Pulo Shield) with objective of protecting oil installations and curbing oil theft and sea piracy. To give effect to the International Ship and Port Facility Security Code, which is an amendment to the Safety of Life at Sea (SOLAS) Convention 1974/1988 on maritime security, including minimum security arrangement for chips, ports and government agencies, the Presidential Implementation Committee on Maritime Safety and Security was set up in 2004. In this light, a regional maritime rescue coordination centre was established to ensure effective search and rescue. Additionally, the Nigerian government also signed multilateral agreements with neighbouring countries geared towards protecting the maritime domain and tackling piracy.

According to Adejuyigbe, Nigeria's government has placed a high priority on addressing piracy and armed robbery at sea and, therefore, has made significant investment in, among others, the procurement of security equipment and essential infrastructure to combat the menace.[32] In

29 ibid.

30 Kathryn Nwajiaku-Dahou, 'The Politics of Amnesty in the Niger Delta: Challenges Ahead' (2010) French Institute of International Affairs 3.

31 Kenneth Ehigiator, 'Why Amnesty Ends 2015—Kuku' (2015) The Vanguard <www.vanguardngr.com/2013/06/why-amnesty-ends-2015-kuku/> accessed 18 January 2023.

32 Aluseyi Adejuyigbe, 'Piracy in the Gulf of Guinea: an unending menace' (Ibanet, 1 December 2021) <www.ibanet.org/piracy-gulf-of-guinea> accessed 20 January 2024.

2018, the Nigerian Navy acquired over 173 boats to enhance patrols in the Gulf of Guinea and riverine areas on a regular basis. Additionally, upgrades to surveillance technology, such as the Regional Maritime Awareness Capability System (RMAC) and the Falcon Eye System, have been implemented.[33]

Moreover, Nigeria, in collaboration with international shipping partners, has launched a new strategy in 2022 to combat piracy in the GoG.[34] This strategy includes regular evaluations of country-specific anti-piracy initiatives and commitments in the region. It also identifies areas for enhancement and reinforcement to eradicate maritime piracy effectively. The plan involves two main components: (1) actions managed by the Nigerian Industry Working Group (NIWG) and (2) measures requiring cooperation from regional and international stakeholders. The overarching goal of the alliance is to diminish piracy in the GoG and ensure the safety of trade routes and maritime users.

It is essential to highlight two significant milestones in Nigeria's efforts to combat insecurity in the Gulf of Guinea. These include the initiation of the Deep Blue Project in 2021 and the enactment of the SPOMO Act in 2019.[35] Through the Nigerian Maritime Administration and Safety Agency (NIMASA), Nigeria established the "Integrated National Security and Waterways Protection Infrastructure," known as the Deep Blue Project. This initiative represents the first integrated maritime security strategy in West and Central Africa, aimed at addressing piracy, sea robbery, and other maritime crimes.[36] The Deep Blue Project serves as a national endeavour to enhance maritime security within Nigerian territorial waters and extend its impact to the Gulf of Guinea, aligning with NIMASA's mission of ensuring safe and secure shipping. The project's framework revolves around four key components: situational awareness of the maritime domain, rapid response capabilities, law enforcement, and internal and regional collaboration.[37] The effective deployment of resources to implement these elements is instrumental in Nigeria's pursuit of the project's objectives, which include curbing maritime piracy, oil theft, armed robbery, and the

33 ibid.

34 'Nigeria and shipping industry launch strategy to eliminate piracy threat in Gulf of Guinea' (2022) BIMCO <www.bimco.org/news/priority-news/20220711-gulf-of-guinea-press-release> accessed 24 January 2024.

35 Badaru Garba, 'Maritime Security in the Gulf of Guinea with emphasis on Nigeria' (Master's thesis, World Maritime University 2022).

36 Nigerian Maritime Administration and Safety Agency, 'President Buhari Launces Deep Blue Project in Lagos' (NIMASA, 2021) <https://nimasa.gov.ng/president-buhari-launches-deep-blue-project-inlagos/#:~:text=The%20Deep%20Blue%20Project%20is%20the%20first%20integrated%20maritime%20security> accessed 23 January 2024.

37 'As Nigeria set to launch maritime security, pirates abduct five in Gulf of Guinea' (20 May 2021) Tribune Online <https://tribuneonlineng.com/as-nigeria-set-to-launch-maritime-security-pirates-abduct-five-in-gulf-of-guinea/> accessed 25 January 2024.

illegal trafficking of humans and drugs. There has also been a civil-military partnership employed to tackle piracy. For instance, the NAVY and NIMASA in concert intensified security patrols within Nigeria's territorial waters.[38]

4.2. Ghana

Undoubtedly, Ghana's maritime landscape has experienced significant changes over the past twelve years, particularly with the recent discovery of hydrocarbon resources reshaping the economic outlook. However, maritime security challenges, notably piracy, persist as a major concern for Ghana's maritime domain and the wider Gulf of Guinea region.[39] Key threats to Ghana's maritime domain include marine pollution, IUU fishing, illegal bunkering, and crude oil theft.[40] In response to these challenges, the Ghana Maritime Authority (GMA) has taken proactive measures. It has acquired six modern speedboats and four search and rescue vessels to enhance security and safety along its coastal areas. This procurement aligns with the Authority's objective of collaborating with other law enforcement agencies to combat sea piracy and curb illegal maritime activities in coastal regions.[41]

A collaborative effort involving the Ghana Maritime Authority (GMA), the Navy, the Port Authority and the Marine Police Unit is using these newly purchased boats to conduct night-time surveillance of the anchorages at Takoradi and Tema Ports, along with several national installations, to prevent illegal activities. The Authority is committed to preparedness for disasters and emergencies, with the Search and Rescue vessels being a key component of this preparedness strategy.[42] This initiative is particularly significant given the estimated passage of around 1500 cargo ships, tankers, and fishing vessels through the Gulf of Guinea (GoG) daily.[43]

Furthermore, Ghana maintains dedicated troops under the Strengthening Border Security (SBS) initiative, who engage in annual training exercises with support from Danish and American

38 Hasan (n 28).

39 Dimitrios Dalaklis, 'Exploring the Issue of Maritime Domain Awareness in Ghana' (2019) Maritime Interdictions Operations Journal <www.academia.edu/40624464/Exploring_the_Issue_of_Maritime_Domain_Awareness_in_Ghana> accessed 23 January 2024.

40 ibid.

41 Garba, 'Maritime Security in the Gulf of Guinea' (n 35).

42 Ghana Maritime Authority, 'Maritime Security' (GMA, 2022) <https://ghanamaritime.org/home/maritime-security/> accessed 25 January 2024.

43 'Ghana to push for international response on Gulf of Guinea piracy' (15 December 2021) Safety4Sea <https://safety-4sea.com/ghana-to-push-for-international-response-on-gulf-of-guinea-piracy/> accessed 21 January 2024.

forces.[44] These drills, including offensive manoeuvres and emergency medical training, aim to enhance Ghana's maritime security capabilities, fortify its defence of territorial waters, and foster regional cooperation within the Gulf of Guinea (GoG). Established in 2016, with assistance from Nigerian Special Forces, the SBS currently operates within Ghana's Exclusive Economic Zone (EEZ) utilizing a fleet of vessels, including fast patrol crafts, and coordinates closely with the Ghanaian Air Force to swiftly deploy troops when needed.[45]

Ghana has also leveraged on its role/opportunities at the international front to advocate for international action to combat the prevalence of piracy in the GoG.[46] It is well-documented that Ghana and Norway jointly promoted a United Nations resolution on piracy in the GoG.[47] As a result of this advocacy, the UN Security Council passed Resolution 2634 in 2022, which calls upon member countries of the Gulf of Guinea (GoG) to enact laws within their domestic legal systems to criminalize piracy and armed robbery at sea. The resolution also emphasizes the importance of investigating, prosecuting or extraditing individuals involved in such crimes, as well as those who incite, finance, or intentionally facilitate them, in accordance with applicable international law. Furthermore, the resolution urges GoG countries to promptly respond to requests for internal or regional cooperation, with the assistance of the international community if needed. [48]

5. Assessment of national responses to IUU fishing

In this context, an attempt will be made to critically evaluate the responses of some of the states within the GoG challenged by the phenomena of IUU fishing, and the extent to which international and regional frameworks are domesticated to address IUU fishing as part of the overall objective of tackling the maritime challenges in the GoG.

5.1. Liberia

Liberia has adopted quite a number of strategies for the management and regulation against IUU fishing. The Liberian Fisheries Policy was formulated to mirror the international obligation

44 ADF, 'Ghana Navy Special Boat Squadron Trains to Secure Gulf of Guinea' (Accra, 24 May 2022) <https://adf-magazine.com/2022/05/ghana-navy-special-boat-squadron-trains-to-secure-gulf-of-guinea/> accessed 26 January 2024.

45 ibid.

46 'Ghana to push for international response on Gulf of Guinea piracy' (n 43).

47 Maritime Executive, 'UN Security Council Calls for Renewed focus on Gulf of Guinea Piracy' (3 June 2022) <https://maritime-executive.com/article/un-security-council-calls-for-renewed-focus-on-gulf-of-guinea-piracy> accessed 25 January 2024.

48 UN Res 2634 (n 24).

imposed on states to implement effective monitoring, control, and surveillance.[49] The Fisheries legal framework consists of the Natural Resources Act 1956 and the Liberia Fisheries Regulations 2010. Worryingly, the Exclusive Economic Zone as sanctioned through Executive Order 39 was not delineated in accordance with the baseline under Part IV of UNCLOS; a development contrary to article 57 of UNCLOS.[50]

Currently, Liberia has fashioned an action plan akin to that of the IPOA-IUU to tackle IUU fishing. Liberia's NPOA-IUU outlines 8 action plans to tackle the menace that comes with IUU fishing. The overall objective of the NPOA-IUU is to give effect to international fisheries agreements to which Liberia is a party. Thus, Liberia commits to ratifying and implementing the UN Fish Stock Agreement, as well as ratifying the FAO Port State Measures Agreement. The second action plan is aimed at strengthening the regulatory framework for operation fisheries management in Liberia. The third is directed at effectively controlling activities associated with IUU fishing. Under this action plan, the state commits to strengthening the Fisheries Monitoring, Control, Surveillance and Enforcement Unit and to coordinate fisheries enforcement tasking with the MCSCC. Action plan 4 of the NPOA mirrors both regional and international obligations imposed on state parties to identify and monitor IUU vessels and share information with neighbouring states.[51] Similarly, Liberia's NPOA-IUU also seeks to identify and quantify illegal catches[52] and most importantly, seeks to contribute to improved global information on IUU fishing vessels.[53]

5.2. Cameroon

Cameroon makes use of both institutional and legislative frameworks to tackle challenges surrounding IUU fishing. Through a Presidential decree, the Ministry of Fisheries Livestock & Animal Husbandry (MINEPIA) was created and vested with the responsibility for the expansion, execution, and follow-up of government policies with respect to fishing, fisheries management, and sustainable development of the sector. MINEPIA is to provide fishing authorizations, follow-up activities of licensed vessels and, most importantly, to ensure the respect of all fisheries legislation

49 Thus, under article 3.2.5 of the Liberia Fisheries Policy the law runs that, implementing effective monitoring, control, and surveillance (MCS) mechanisms that encourage, enforce and monitor compliance government will adopt innovative and appropriate technology and tools; appropriate enforcement hardware; information sharing and cooperation at local, national, regional and international levels and risk assessment, to prevent IUU fishing in a cost-effective and practical manner.

50 Republic of Liberia, National Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fisheries (NPOA-IUU) (September 2018).

51 Article 13(2) of the SUA Convention and article 11 of the Yaoundé Code of Conduct.

52 NPOA-IUU (n 50) Action 5.

53 NPOA-IUU (n 50) Action 6.

and to promote fisheries production.[54] The MINEPIA is subdivided into four sub-departments answerable to the Minister and charged with the obligation of performing the aforementioned functions. The institutional frameworks established by the Cameroonian government are not to operate *in vacuo*. In addition, Law Number 96/12 of 1996, which covers the management of the environment, was promulgated. This law provides a universal framework for the management of the environment and provides guiding doctrines for the protection of the coastal marine environment and the management of resources, as well as sustainable development.

It is important to note that the law governing the licensing of vessels is in sharp contrast with quite a number of international instruments due to the lack of harmonisation and domestication. For example, article 119 of the 1994 Fishery legislation makes provisions for high seas fishing licenses even though there are no conditions laid down for this type of fishing together with access to other coastal waters. This is in disagreement with CA 1993 and UNFSA 1995.[55] In article 92(2) of UNCLOS; 'a ship which sails under the flag of two or more States, using them according to convenience may not claim any of the nationalities in question with respect to any State and may be assimilated to a ship without nationality.' The law governing the control of coastal state vessels is provided for in articles 34 to 41 of IPOA-IUU. That notwithstanding, the 1994 Fishery Legislation presents six types of sanctions, as required by article 21 of the IPOA-IUU, which encourages coastal states to put in place very severe sanctions. The newly proposed fishery regulation in Cameroon increases the number of sanctions from 6 to 7.

However, Cameroon lacks Monitoring, Control and Surveillance (MCS) systems because they are less operational in its coastal waters, which makes it difficult for effective monitoring and control.

6. Evaluation of regional and national efforts on piracy related activities

Undoubtedly, the YCoC is a significant step towards enhancing regional maritime governance in the GoG. Hasan describes the YCoC as 'a good model of effective regional cooperation as it elaborates a common maritime security strategy for the entire maritime domain of West and Central Africa'. However, considering the fact that the Code is not a legally binding instrument, it imposes no legal obligation on any state to implement it. Therefore, compliance with the Code is premised on the political will of the signatory country. Additionally, a careful review of regional

54 Noella N. Mbotiji, 'An impact assessment of Illegal Unreported Unregulated (IUU) fishing in Central Africa as a step towards sustainability in Africa's fishing industry: case study: Cameroon' (M.Sc. Thesis, World Maritime University 2019).

55 ibid.

and national strategies employed to repress piracy in the region highlights that the full and effective implementation of the Code requires both technical know-how and financial muscle. Not only are countries within the region lacking the requisite skills and training to embark on such an ambitious agenda of tackling maritime security challenges in the GoG, but they also lack the financial wherewithal to procure logistics and equipment necessary to tackle maritime challenges in the region. In addition, implementation requires significant legal and institutional adjustments at the national level. Differences in the wealth and capacity of signatories are expected to affect their implementation capabilities at the national level.

Going forward, it is important to note that while there is a concerted approach through the codification of the Yaoundé Code of Conduct 2013, the establishment of ICC and a host of other initiatives, the harmonisation of frameworks at the national level is rather slow. The lack of harmonisation in piracy laws among states stalls any process aimed at deterring piracy. While certain states within the Gulf of Guinea (GoG) possess sufficient assets to conduct effective patrols in their maritime zones, the majority are significantly constrained in their ability to participate in regional maritime security collaboration. This collaboration is deemed essential due to overlapping jurisdictions and the interconnected nature of maritime challenges, which pose threats to neighbouring countries' maritime passages, particularly those located far from coastlines.[56] According to Ali, the operationalization of cooperative maritime security in the GoG faces serious limitations due to the limited capabilities of the states involved.[57] Despite some countries in the region showing promising progress, the Gulf of Guinea remains one of the most perilous areas globally for ships and seafarers.[58]

The examples provided below serve to illustrate the prevalent lack of adequate capability and underscore the necessity for mutual support. According to data from the Military Balance, the disparity between the number of military personnel allocated to the Navy compared to the Army is significant across all countries in the Gulf of Guinea (GoG), and the level of military funding allocated to the Navy is disproportionately smaller compared to the overall defence budgets.[59] Specifically, Nigeria lacks the necessary capabilities to effectively patrol its maritime domain, thereby severely constraining its ability to contribute to regional maritime security cooperation in the

56 Felix N. Ajeagah, 'Combating Piracy in the Gulf of Guinea: Understanding the Challenges of the Yaoundé Architecture for Maritime Security' (Master's thesis, Naval Postgraduate School 2022).

57 Kamal-Deen Ali, *Maritime Security Cooperation in the Gulf of Guinea: Prospects and Challenges* (Brill 2015).

58 Donald Inwalomhe, 'Maritime Security in the Gulf of Guinea', The Sun (Abuja, 26 August 2019).

59 IISS, 'International Comparisons of Defence Expenditures and Military Personnel,' The Military Balance (2022) 122(1).

context of the heightened threats in the region.[60] IISS further observes that the Nigerian Navy suffers from underfunding and limited capability in patrolling its maritime zones.[61] Despite having the largest Navy in the GoG, Nigeria's naval budget consistently ranks as the smallest among the country's three armed services.[62] Despite recent enhancements and procurement efforts aimed at bolstering its counterpiracy capabilities, Nigeria's capacity is reportedly capable of securing its maritime waters up to 200 nautical miles. However, pirates in the GoG have expanded their reach, now posing a threat to commercial shipping well beyond Nigeria's Exclusive Economic Zone (EEZ) (Binnie; Janes, 2021).[63]

Similarly, while Ghana possesses certain assets for patrolling its territorial waters, its capabilities fall short of the expansive operations carried out by pirates.[64] It is widely acknowledged that Ghana faces a higher frequency of piracy incidents compared to terrorist attacks. Nevertheless, the budget allocation for the Ghana Navy significantly lags behind that of other branches of the Armed Forces. Relative to the army, the Ghana Navy commands only 15 percent of military personnel, and it receives a mere 12 percent of the defence budget.[65] Like other countries within the Gulf of Guinea (GoG), Ghana has invested in acquiring assets to counter piracy in the region. Its inventory includes four offshore patrol vessels (OPVs) measuring 58 metres and four fast attack crafts of 47 metres.[66] Since 2014, Ghana has also established radar stations and command-and-control centres along its coastline. However, these capabilities appear insufficient to address Ghana's varied maritime interests, particularly in ensuring security within its Exclusive Economic Zone (EEZ) and safeguarding its offshore oil platforms.[67]

6.1. Effectiveness of National Response to IUU fishing in the GoG

The varied response from states to halt IUU fishing activities in the maritime domain of the GoG clearly evinces the willingness to fight the menace. However, the various national institution-

60 Ajeagah (n 56).

61 IISS, '2022 Chapter Nine: Sub-Saharan Africa: Regional Trends' *The Military Balance* (2022) 122(1) 452.

62 'Nigeria: Defense Budget' (2022) Janes <https://customer.janes.com/DefenceBudgets/Guided?view=chart&f=COUNTRY(nigeria)&pg=1&template=> accessed 22 January 2024.

63 Jeremy Binnie, 'Nigerian Navy Inaugurates Falcon Eye Surveillance System (C4ISR)' (15 July 2021) Janes <www.janes.com/defence-news/news-detail/nigerian-navy-inaugurates-falcon-eye-surveillance-system> accessed 24 January 2024.

64 ICC International Maritime Bureau, 'Piracy and Armed Robbery Against Ships: Report for the period 1 January-31 December 2021' (2022).

65 IISS, '2022 Chapter Nine' (n 61).

66 ibid.

67 Ajeagah (n 56).

al and legal frameworks discussed above shows that the response from the national level remains inadequate and weak. IUU fishing in the region is on the ascendancy due to weak national fishery strategies bridled with ambiguous provisions for arresting the menace. In the Liberian case, it is well-documented that the current understanding by fishers of the regulations, or at least the most important ones, are difficult to access and to understand.[68] One sure way to tackle IUU fishing is to build an effective MCS system to ensure rigorous monitoring of vessels and to clamp down on illicit activities. Data in the fishery sector in Cameroon is incomplete, poorly coordinated, and overly centralized with inadequate sharing of information.[69]

There is also an existing gap between international legal frameworks, the regional frameworks, and the national legal and institutional frameworks. Generally, states are obliged to cooperate with competent organizations at the sub-regional, regional, and global levels with the aim of avoiding over-exploitation and of exchanging scientific data for the better management of living resources, as provided in article 61(2) and (5) of the UNCLOS. This obligation, at best, exists on paper at the international level, because fisheries laws in countries such as Cameroon are not in tandem with international principles. All these existing gaps have culminated in the weak security architecture designed and rolled out to combat the maritime security challenges in the GoG.

As stated above, the overall ineffectiveness of the maritime security architecture of the GoG cannot be solely attributed to the legal, institutional, and structural imbalances among member countries but also partly to the language and inherent inadequacies of international frameworks.

7. Realities of the maritime security arrangements of the GoG and the policy implications

In summary, several arrangements exist at the international and regional levels with binding, enforceable provisions that are applicable in the GoG. Most of the key arrangements at the sub regional level, such as the ECOWAS and ECCAS maritime strategies, as well as the Yaoundé architecture, exist without clearly defined binding character, and this affects their enforcement. Notwithstanding, these sub regional arrangements continue to grow in relevance in relation to the governance of the GoG. In this context, therefore, a number of issues should be considered.

First, the two critical maritime strategies in the GoG exist at regional economic communi-

68 NPOA-IUU (n 50).

69 Mbotiji, 'An impact assessment of Illegal Unreported Unregulated' (n 54).

ty levels. The Constitutive Acts of both ECOWAS and ECCAS enjoin member states to respect, enforce and implement the rules, policies and strategies adopted at the community levels. Even though these may in themselves suffer from the general limitations of the enforcement of treaty obligations and international law, they are still enforceable through the constitutive obligation of member states to respect and implement the policies and strategies. Consequently, the paper takes the position that the dynamics of regimes in the GoG need to be looked at holistically and inclusively to be able to accommodate the realities of the GoG. Second, these strategies should be widely accepted by member states. The reality is that all twenty-five-member states of ECOWAS and ECCAS have signed up to the respective strategies. Additionally, several of the states have in this regard implemented some aspects of the strategies, albeit with limited success. Consequently, these sub-regional strategies continue to influence cooperative actions and the behaviour of these GoG states regardless of the differing levels of success and implementation levels. The absence of rules proscribing wayward conduct may not in themselves be fatal to demonstrate regime formation or effectiveness. As it is with other regime or cooperative arrangements, the costs of noncompliance with collective action or decisions would be the consequences of reputational damage and diminishing trust in future cooperative action.

Another stark reality is that existing frameworks wholly borrowed the definition of piracy and its related activities from recognized international conventions with no necessary modifications to suit the nature of attacks in the GoG. The policy implication is that what may be deemed as piracy within the parlance of international law may not be reflective of the situation in the GoG, thus creating a significant gap between policies on paper and the reality on the ground.

Furthermore, there are multiple institutions at the sub regional level with differing rules, aims and objectives, as well as memberships. The ICC and the Yaoundé Code of Conduct, ECOWAS, ECCAS and MOWCA have the largest support of member states, even though they exist at different levels. Whilst ECOWAS and ECCAS exist at the highest political levels, MOWCA exists at the ministerial level. Again, even though the ICC exists at the highest political level, its mandate is only operational and does not set the rules or engage in policy. Even though the code of conduct in its current form is non-binding, recommendations by the panel of experts from member countries, who undertook its review in 2017, have proposed that the legal text of the code of conduct should be made binding. This would make it enforceable as a binding treaty. Notwithstanding, the operational arrangements proposed by the code of conduct have been mostly implemented by GoG states.

Lastly, the GGC, which has been given the mandate at the highest political level to implement the Yaoundé architecture with ECOWAS and ECCAS, has a membership of nine (9) states and a

limited role in terms of the running of the administrative structures of the ICC.

This cluster of institutions presents, in essence, principles and beliefs of fact, causation and rectitude to guide the behaviour of its members. Additionally, there are norms which are standards of behaviour defined in terms of rights and obligations, as noted in the zonal arrangements under the ICC code of conduct. In terms of rules, while there may be no specific proscriptions, there are prescriptions for action in terms of multilevel cooperative arrangements for information sharing and surveillance. Decision-making procedures that are prevailing practices for making and implementing collective action are also present in the current sub regional arrangements in the GoG.[70]

The issues of maritime security continue to receive attention at the GoG and international levels, and this increased what Krasner calls "issue density".[71] For Krasner, this would lead to greater demand for international regimes and, in this regard, a sub-regional regime. Since the issues of maritime insecurity have national, sub regional and international repercussions, it presents a situation of high interdependence that forges a link between interdependence and international regimes. The fragmented institutional interplay speaks to an emerging regime, regime clusters or complex in the GoG, and the literature and academic views on regimes would have to be applied broadly in the GoG to explain the realities of the region.

This view is supported by the conclusions of a dialogue published by the Friedrich-Ebert-Stiftung foundation.[72] Giessen also argues that a regime is a complex set of governance arrangements that are more or less loosely linked together, sometimes reinforcing each other but at other times overlapping and conflicting.[73] The existing GoG arrangements sometimes overlap and conflict with each other in dealing with issues of insecurity but are also able to reinforce each other and facilitate cooperation, as demonstrated by the Yaoundé architecture.

70 Stephen D. Krasner, *Structural conflict: The Third World against global liberalism* (University of California Press 1985).

71 Stephen D. Krasner, 'Structural Causes and Regime Consequences: Regimes as Intervening Variables' (1982) 36 International Organization 185.

72 Friedrich-Ebert-Stiftung, 'A comprehensive regime for maritime security in the Gulf of Guinea' (2014) <www.fes-westafrica.org> accessed 26 January 2024; Robert O. Keohane R. and David G. Victor, 'The regime complex for climate change' (2011) 9 Perspectives on Politics 7.

73 Lukas Giessen, 'Reviewing the main characteristics of the international forest regime complex and partial explanations for its fragmentation' (2013) 15 International Forestry Review 60.

8. Conclusion

Despite the importance of the GoG, it has endured serious maritime instability as well as insecurity from weak governance, meaning that proper management through laws and strengthened institutional arrangements are needed to realize the blue economy.

Given the acknowledged importance of the blue economy to the realization of the development goals of GoG states, a critical assessment of the nature of, and the interface between, regional and national responses towards dealing with insecurity within the region is necessary.

This article has sought to critically evaluate the effectiveness of regional and national responses towards maritime security in the region.

The evaluation has shown that the legal and institutional arrangements at the global level have been cast to reflect binding regime arrangements. However, the trend among sub-regional arrangements to emulate international agreements by adopting non-binding language is concerning. These can be explained from two angles. First, states in the sub region are sceptical due to the state centric security posture they adopt, especially in relation to information sharing and erosion of their border controls. On the other hand, most states are sea blind about the significance of these arrangements in terms of the realization of the blue economy, hence they are not willing to invest their resources in the potential of the sea.

Notwithstanding the non-binding nature of these arrangements regarding the GoG, they are highly subscribed to by major regional players. Even though these emerging arrangements do not fit into the regime theory as formulated by Krasner, they constitute a cluster when the net effects of all sub-regional arrangements are considered together, as they reinforce one another in ways leading to a regime cluster or complex.

While this article contributes to our understanding of the importance of the existing maritime security arrangements, particularly national responses, given the non-binding nature of key regional efforts, further research is needed to understand how to move from a cluster of arrangements into a binding regime complex.

Maritime Safety and Security Law Journal

Current Development

The Adoption of the New Legally Binding Instrument on Marine Biodiversity Conservation and Sustainable Use in Areas Beyond National Jurisdiction

On Saturday 4 March 2023, in New York, the President of the Intergovernmental Conference, Rena Lee, announced, to the applause of the delegates, that the ship had finally 'reached the shore'. After more than 15 years of discussions, an agreement has been reached on the conservation and sustainable use of marine biodiversity beyond areas of national jurisdiction (ABNJ). This achievement has unanimously and rightfully been described as 'historic' by commentators.

States began to consider the need to supplement the provisions of UNCLOS (United Nations Convention on the Law of the Sea) in the UN General Assembly in the early 2000s, in a context where massive biodiversity loss was already being denounced. The following question was raised: is the inadequate protection of biodiversity on the high seas solely the result of insufficient implementation of their obligations by states, or are there 'gaps' that can be filled by international law? An Informal Working Group, established in 2004 to consider the various options available to states, issued its conclusions in 2015, calling for the adoption of a new implementing agreement for UNCLOS. The process accelerated when the idea of adopting a 'legally binding instrument' was endorsed by the General Assembly. The General Assembly therefore convened a Preparatory Committee, which met between 2016 and 2018 to prepare for the Intergovernmental Conference, a formal negotiating forum between states, which met four times between 2019 and 2021. However, the coronavirus pandemic delayed the process somewhat and an additional final session was necessary because the fourth session failed to reach consensus.

At the fifth session of the International Governmental Conference, held in August 2022, many points of disagreement remained between states, in particular concerning the status and modalities of the exploitation of marine genetic resources and digital sequences information on marine genetic resources (MGR), which was one of the thorniest issues. At the end of the August 2022 session, the IGC President took the initiative not to close the session but to adjourn it, thus facilitating the resumption of discussions in February and paving the way for their eventual success. In March, during the final days of negotiation, states finally agreed on this very complex issue. The new treaty will finally make it possible to regulate access to these resources and associated digital sequence information (notification system) and to ensure that any benefits (monetary and non-monetary) derived from their exploitation are equitably shared with developing countries, which should also benefit from capacity building and the transfer of marine technologies. The fact that the states finally agreed on this point is remarkable (or even miraculous) given that their initial positions were radically opposed.

The treaty also focuses on two particular conservation tools: marine protected areas (MPAs) and environmental impact assessments (EIAs). With regard to MPAs, it establishes a global mechanism that will allow states to propose, individually or collectively, their designation and make them enforceable against all states parties - in line with the 30×30 target established in December at the COP15 on biodiversity. The text specifies the details of the content of the proposals,

the associated conservation measures and the monitoring of their implementation in the framework of the Conference of the Parties to the treaty. States are invited to consult and collaborate with all relevant stakeholders, including civil society and indigenous peoples. However, an 'opt-out' possibility has been included in the process, meaning that states (and especially coastal states) can refuse, in extremis, to be linked to the conservation measures of the protected area – but only in very specific conditions. Secondly, the treaty sets out the modalities for the implementation of the EIA requirement for activities that take place in, or are likely to cause harm to, international maritime spaces. Indications are given as to the threshold above which they are required to be carried out, the obligation to publish them, their content and the notification and stakeholder consultation process. The state initiating the project must take account of the outcome of the assessment, but remains ultimately competent to decide whether or not to carry it out.

The preamble recalls that states already have a general obligation under UNCLOS to protect and preserve the marine environment and that they must be held accountable for any breach of their obligations in this regard. It also refers to the impacts of climate change on marine biodiversity and allows for a systemic interpretation of the agreement, with the overall objective of working to limit the erosion of biodiversity in these areas for the benefit of future generations.

The main objective of the treaty is to promote cooperation and coordination in the context of marine biodiversity conservation. An important challenge will therefore be to ensure that the new treaty does not undermine existing global and regional frameworks with a biodiversity mandate, in order to preserve the coherence of rules applicable to these areas and for the sake of legal certainty and efficiency. This issue was a topical point of the negotiations. For example, the articulation between the new treaty, and deep-sea exploration and exploitation or fishing activities, both of which are already regulated by other international frameworks, may not be obvious in practice because the competent organizations and frameworks bring together different parties, have different objectives and competences (spatially as well as in terms of substance) and do not work usually with a high degree of coordination. To this end, the COP will have to consult and make recommendations with the relevant institutions, and the parties will at the same time promote the conservation and sustainable use of biodiversity in international areas when participating in other decision-making processes. The COP will therefore have the crucial role of determining whether the processes carried out in other forums are coherent and compatible with the new framework, whether in terms of MPAs or impact studies.

In any case, the new treaty still needs to be ratified by states in order to enter into force (in principle 120 days after the deposit of the 60th instrument of ratification). Since its opening for signature, on 21 September 2023, 83 states have signed the text but they have not yet ratified it. Its provisions can then be refined by the Conference of the Parties established, while its implementation will depend mainly on the goodwill of states. A mechanism for the settlement of disputes, inspired by the one UNCLOS, with specific dispositions regarding the possibility for the COP to request an advisory opinion from the International Tribunal for the Law of the Sea, is also provided by the treaty. The creation of a secretariat, a scientific and technical body and a compliance committee should contribute to organize and ensure, as well, the effective implementation of the new agreement.

Despite all the remaining uncertainties, the step that has just been taken is decisive and constitutes a new starting point for biodiversity conservation.

Pascale RICARD and Samira BEN ALI

COP15 and the Kunming-Montreal Global Biodiversity Framework

On 19 December 2022, during the 15th Conference of the Parties (COP) of the Convention on Biological Diversity (CBD), the 196 members of the Convention[1] adopted the Kunming-Montreal Global Biodiversity Framework[2] to try to 'halt and reserve' biodiversity losses[3]. Indeed, with six out of nine planetary limits having been exceeded and with more than 42,000 known species 'threatened with extinction' according to the IUCN Red List[4], the world is said to be facing its sixth global mass extinction, an extinction that has the particularity of being anthropogenic. The new Global Biodiversity Framework outlines a total of four general goals and twenty-three action-oriented targets to try to respond to this global biodiversity crisis by 2030[5]. They are rooted in the 'theory of change', which calls for an urgent political action at all levels when it comes to biodiversity losses. One of the most emblematic measures of the framework, also known by NGOs as the 30x30 target, calls for the creation of a network of protected areas on 30% of the land and 30% of the sea by 2030 (Target n°3). Other targets intend to stop the extinction of known species, reduce the negative impacts of pollution from all sources, substantially the risks linked to the use of pesticides as well as harmful subsidies. The underlying goal here is to try to achieve what the 2011-2020 Aichi Biodiversity Framework was not able to do.

The agreement is deeply rooted in science: it relies on and responds to the IPBES 2019 *Global Assessment Report on Biodiversity and Ecosystem Services*[6]. Indeed, the five most important direct threats to biodiversity listed by the report - namely land and sea use change, direct exploitation of organisms, climate change, pollution and invasion of alien species - are the rationale for the 'global action-oriented targets': among others, Targets 2, 3 and 12 address the protection of land and sea areas, ecosystem restoration, and green and blue space connectivity; Target 5 addresses biodiversity uses, harvesting and trade; Target 6 invasive alien species; Target 7 pollution risks from all sources; and Target 8 focuses on the link between biodiversity and climate change. The new framework also puts inclusivity at the forefront of its strategy. For example, the text mentions several times the importance of indigenous communities when it comes to the protection and restoration of ecosystems. As is usually the case during COPs, all types of stakeholders were able to interact and to influence the outcome

1 Convention on Biological Diversity (adopted 5 June 1992, entered into force 29 December 1993)1760 U.N.T.S. 79.

2 Conference of the Parties to the Convention on Biological Diversity, (18 December 2022) U.N. Doc. CBD/COP/15/L.25, Kunming-Montreal Global Biodiversity Framework, Draft Decision Submitted by the President.

3 Because of the COVID-19 pandemic, the COP15 had to be postponed by two years. The additional time allowed the negotiators to work on a text that has finally been adopted by consensus, despite last-minute opposition from the Democratic Republic of Congo.

4 This number includes, 69% of cycads, 41% of amphibians, 37% of sharks and rays, 36% of coral reefs, 34% of conifers, 27% of mammals, and much more. All information is detailed on the IUCN Red List website <www.iucnredlist.org/> accessed 09 November 2023.

5 CBD, Nations Adopt Four Goals, 23 Targets for 2030 in Landmark UN Biodiversity Agreement, CBD Press Release (Dec. 19, 2022).

6 IPBES (2019): Global Assessment Report on Biodiversity and Ecosystem Services. E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo (editors). IPBES secretariat, Bonn. 1,148 pages.

of the agreement[7]. This particular point has raised some concerns and NGOs have questioned the impact of a text where parties driven by economic interests were able to participate.

One of the main weaknesses of the previous Aichi Framework was that it had not been accompanied by a precisely costed financing plan (the Global Environment Facility was merely expected to provide 'predictable [a]nd timely' assistance). Therefore, the question of the mobilization of financial resources led to difficult negotiations, as countries with less revenues and less historical impacts when it comes to the loss of biodiversity were asking for financial assistance and calling for equity — which is directly related to the principle of common but differentiated responsibility. A compromise was reached that pledged to dedicate 200 billion US dollars per year by 2030 from all sources (private and public) to biodiversity[8]. It also pledged that developed countries must contribute 20 billion dollars per year to the biodiversity efforts of less developed countries by 2025 and 30 billion per year by 2030. A large part of this money will be put into a trust fund, under the protection of the Global Environment Facility (GEF), that will be in charge of supporting the implementation process.

To ensure the effectiveness and efficiency of the framework, monitoring processes and indicators have also been put in place. The lack of monitoring and following up mechanisms was indeed part of the weaknesses of the Aichi Framework. For now, each country will have to submit national targets inspired by the framework as well as revising their National Biodiversity Strategy and Action Plan by 2024 (for COP16 in Turkey)[9]. During COP16, those national targets will be evaluated to assess their impacts with regards to the global biodiversity goals. From then on, each country will have to periodically submit national reports on the effects of the implementation of these targets in their respective countries. Those reports – as well as independent analysis – will then be used to conduct global reviews of the state of biodiversity[10].

While the framework is a definite and ambitious step in the direction of improved biodiversity protection, rooted in the rights-based approach (with a recognition of the human right to a clean and healthy environment and the rights of indigenous people), it still leaves room for improvement. Indeed, the monitoring systems, which are key points for the success of this global project, leave little room for the notion of uncertainty; they are also not designed to take into account the complexity that comes with dealing with biodiversity. Additionally, one cannot help but take note of the cautious nature of the language used to define the targets, and the non-legally binding nature of the text. This ultimately raises questions on its effectiveness. The next COPs will be decisive for the precision and implementation of the framework, particularly with regard to some subjects who were voluntarily set aside for the success of COP15: the monitoring framework must be refined, with important work still to be done on indicators, the timetable for the revision of national biodiversity strategies and action plans (NBSAPs) must be set, and several decisions still need to be taken, notably concerning the equitable sharing of benefits arising from information on the digital sequences of genetic resources.

7 Gibson Dunn, Adoption of a new global biodiversity framework - key takeaways for global organizations and financial firms, 2023.

8 Conference of the Parties to the Convention on Biological Diversity (n 2).

9 Conf. of the Parties to the Convention on Biological Diversity (18 December 2022) U.N. Doc. CBD/COP/15/L.26, Monitoring framework for the Kunming-Montreal global biodiversity framework, Draft Decision Submitted by the President.

10 ibid.

The decision on the articulation of climate and biodiversity issues also needs to be rediscussed because the reference to the principle of common but differentiated responsibilities has prevented an agreement from being reached. Some observers also regretted the lack of attention paid to the issue of the impact on biodiversity of the fishing and agricultural industries. As some observers finally and effectively noted, 'the work is really just beginning'.

Pascale RICARD and Samira BEN ALI

Observations on the advisory opinion request submitted by the COSIS to the ITLOS on States' obligations regarding climate change

On 12 December 2022, the Commission of Small Island States on Climate Change and International Law (COSIS), co-chaired by the governments of Antigua and Barbuda and Tuvalu[1], submitted a request for an advisory opinion to the International Tribunal for the Law of the Sea (ITLOS) under Article 21 of the Statute of the Tribunal, Article 138 of the Rules of the Tribunal and Article 2(2) of the Agreement Establishing COSIS[2]. The written phase took place during the first half of 2023 and the hearings were held throughout September of the same year[3]. This is the third request to ITLOS for an advisory opinion, the first having been submitted to the Seabed Disputes Chamber and resulting in the advisory opinion on the responsibilities of States sponsoring activities in the Area[4], and the second to the full Tribunal concerning the advisory opinion requested by the Sub-Regional Fisheries Commission[5].

The request submitted to ITLOS by COSIS is in fact the first in a series of other requests for advisory opinions filed by various groups of States in the space of a few months before other international jurisdictions: the request to the Inter-American Court of Human Rights on 9 January 2023 by the Republic of Colombia and the Republic of Chile[6], as well as the request of 29 March 2023 transmitted to the International Court of Justice by the General Assembly of the United Nations, on the initiative of the State of Vanuatu[7].

These three requests have much in common in that they are part of a process of defragmentation and an integrated approach to public international law. Therefore, according to Christina Voigt, 'we are witnessing a new phenomenon: climate change litigation having reached the international level

1 The Commission was established by the article 1(3) of the Agreement for the establishment of the Commission of Small Island States on Climate Change and International Law (adopted on 31 October 2021), with the objective of contributing 'to the definition, implementation and progressive development of rules and principles of international law relating to climate change, including, but not limited to, the obligations of States to protect and preserve the marine environment and their liability for damage resulting from internationally wrongful acts in breach of those obligations'.

2 Request for an Advisory Opinion submitted by the Commission of Small Island States on Climate Change and International Law (Request for Advisory Opinion submitted to the Tribunal), 12 December 2022.

3 See the ITLOS website <www.itlos.org/en/main/cases/list-of-cases/request-for-an-advisory-opinion-submitted-by-the-commission-of-small-island-states-on-climate-change-and-international-law-request-for-advisory-opinion-submitted-to-the-tribunal/> accessed 01 November 2023.

4 ITLOS, Advisory opinion, *Responsibilities and obligations of States sponsoring persons and entities with respect to activities in the Area* (Request for Advisory Opinion submitted to the Seabed Disputes Chamber), 1st February 2011, case n 17.

5 ITLOS, Advisory opinion, *Request for an Advisory Opinion submitted by the Sub-Regional Fisheries Commission (SRFC) (Request for Advisory Opinion submitted to the Tribunal)*, 2 April 2025, case n 21.

6 *Request for an advisory opinion on the Climate Emergency and Human Rights* submitted to the Inter-American Court of Human Rights by the Republic of Colombia and the Republic of Chile, January 9 2023.

7 United Nations General Assembly, Resolution A/77/276: *Request for an advisory opinion of the International Court of Justice on the obligations of States in respect of climate change*, 29 March 2023.

(international courts and tribunal)'[8]. And this comes from 'the need for legal clarifications and authoritative statements by international courts on international environmental law'[9]. This 'new era' of climate change litigation is thus focusing on non-contentious cases. Without being legally binding, advisory opinions hold a strong moral authority[10]. Moreover, the clarity regarding the legal obligations in relations to climate change could make it possible, afterwards, to lodge contentious cases in front of international jurisdictions. In substance, all three cases reflect a strong need - and a 'golden opportunity'[11] - for the international courts concerned to clarify the obligations of States to protect the climate and combat climate change, in the context of other areas of international law affected by their effects, and also to clarify the links between legal frameworks that have hitherto been approached separately, thereby acting as a genuine 'catalyst for political action'[12]. Before the ICJ, the request is extremely broad, since the clarifications requested must be made:

> 'Having particular regard to the Charter of the United Nations, the International Covenant on Civil and Political Rights, the International Covenant on Economic, Social and Cultural Rights, the United Nations Framework Convention on Climate Change, the Paris Agreement, the United Nations Convention on the Law of the Sea, the duty of due diligence, the rights recognized in the Universal Declaration of Human Rights, the principle of prevention of significant harm to the environment and the duty to protect and preserve the marine environment'[13].

In addition, the legal consequences for States that have caused significant damage to the climate system and other components of the environment are considered in this request not only in relation to States, but also 'to the peoples and individuals of present and future generations affected by the adverse effects of climate change'[14].

---

8 C. Voigt, *Advisory Opinions on Climate Change: initiatives, expectations and possibilities*, IUCN World Commission on Environmental Law, 2023 <www.iucn.org/story/202302/iucn-wcel-hosted-webinar-advisory-opinions-climate-change-initiatives-expectations-and> accessed 01 November 2023. Unlike other climate issues, these are not contentious and are not driven by private actors, who are generally the originators of strategic litigation, but by governments (although sometimes with the impetus of private actors). See Alina Miron, 'COSIS Request for an Advisory Opinion: A Poisoned Apple for the ITLOS?' (2023) The International Journal of Marine and Coastal Law, 249-269, p. 251.

9 ITLOS, Advisory opinion (n 4).

10 See *Dispute concerning the delimitation of the maritime boundary between Mauritius and Maldives in the Indian Ocean (Mauritius/Maldives)* (Judgment of the 28 January 2021, Preliminary Objections), 203: 'An advisory opinion is not binding because even the requesting entity is not obligated to comply with it in the same way as parties to contentious proceedings are obligated to comply with a judgment. However, judicial determinations made in advisory opinions carry no less weight and authority than those in judgments because they are made with the same rigour and scrutiny by the 'principal judicial organ' of the United Nations with competence in matters of international law'.

11 Nilufer Oral, *Advisory Opinions on Climate Change: initiatives, expectations and possibilities*, IUCN World Commission on Environmental Law, 2023 <www.iucn.org/story/202302/iucn-wcel-hosted-webinar-advisory-opinions-climate-change-initiatives-expectations-and> accessed 01 November 2023.

12 Jorge E. Vinuales, 'Climate change and the advisory function of international courts and tribunals', Green Diplomacy, 7 March 2023.

13 Request transmitted to the Court, Resolution 77/276 (n 7).

14 ibid.

While the request submitted to the Inter-American Court of Human Rights appears more limited, given that the legal framework concerned is solely that of human rights, it is drafted in particularly broad, inclusive and detailed terms. Human rights are considered through twenty-one questions, both in their individual and collective dimensions. The questions cover a range of issues, including due diligence, the right to life, the rights of the child, procedural rights, environmental protection and the principle of common but differentiated responsibilities. It appears that 'all the questions, explicitly and implicitly, seek to clarify how mitigation, adaptation and loss and damage relate to human rights obligations'[15].

Lastly, the request submitted to ITLOS is limited to the field of the law of the sea and is the shortest and most precise of the three sets of questions put to the international courts. It is worded as follow:

> 'What are the specific obligations of State Parties to the United Nations Convention on the Law of the Sea (the 'UNC LOS'), including under Part XII:
>
> (a) to prevent, reduce and control pollution of the marine environment in relation to the deleterious effects that result or are likely to result from climate change, including through ocean warm in g and sea level rise, and ocean acidification, which are caused by anthropogenic greenhouse gas emissions into the atmosphere?
>
> (b) to protect and preserve the marine environment in relation to climate change impacts, including ocean warming and sea level rise, and ocean acidification?'[16].

The three requests overlap to some extent, since the request to the ICJ largely encompasses the other two. Moreover, it is likely that the ICJ will not be able to go into as much detail as the two specialized courts on the questions also addressed to the latter, or even that it will refer directly to the requests for opinions in question - or to the opinions if the latter have already been issued, which will probably be the case for the one addressed to ITLOS. Such an overlap is not without risk: it 'could trigger either a global legal cacophony with accompanying contradictions or a new, complementary and helpful approach'[17],, reinforced by the dialogue between judges. The three requests 'may be seen as pieces of a puzzle, some smaller, some larger, which when put together will hopefully provide an incomplete but much clearer picture of the actionable obligations of States in relation to the conduct that is driving climate change'[18].

The context surrounding each of these requests is in any case specific to them: As some have pointed

15 Juan Auz, Thalia Viveros-Uehara,, 'Another Advisory Opinion on the Climate Emergency? The Added Value of the Inter-American Court of Human Rights', EJIL Talk <www.ejiltalk.org/another-advisory-opinion-on-the-climate-emergency-the-added-value-of-the-inter-american-court-of-human-rights/> accessed 10 September 2023.

16 Request for an Advisory Opinion submitted by the Commission of Small Island States on Climate Change and International Law, 12 December 2022 (n 2).

17 Juan Auz, Thalia Viveros-Uehara, Another Advisory Opinion (n 15).

18 Jorge E. Vinuales 'Climate change and the advisory function' (n 12).

out, ITLOS and the IACHR are reputed to have a more progressive approach than the ICJ[19]; others, on the other hand, point to the contrast between the apparent simplicity with which the COSIS request for an advisory opinion was submitted to ITLOS and the complexity of the process that led Vanuatu to obtain a consensus vote within the UN General Assembly - a first for this type of resolution -, a process that could possibly increase the legitimacy and authority of the opinion once it has been delivered[20]. Furthermore, the relative simplicity of the referral to ITLOS should not lead us to relativize certain difficulties that will have to be overcome, both in terms of procedure and substance.

These difficulties do not appear to be insurmountable. Admittedly, some States had pointed out, on the occasion of the request for an opinion submitted by the Sub-Regional Fisheries Commission[21], that the UNCLOS makes no explicit reference to such advisory jurisdiction over the Tribunal in its plenary session. In 2015, the Tribunal finally ruled on its jurisdiction in a laconic and very open manner, contenting itself with a literal interpretation of article 21 of its Statute annexed to the Convention[22]. In the submissions filed as part of the COSIS request procedure, very few States actually contest the advisory jurisdiction of the Tribunal in its plenary formation. This is the case for China, which rejects the Tribunal's advisory jurisdiction en bloc and in great detail, as it did in the 2015 opinion[23], India[24] and Brazil[25]. Of course, it may also refuse to give this opinion for 'decisive reasons'[26], but the conditions appear to be right for it to exercise its advisory jurisdiction in this fundamental case, which will determine the content and scope of the obligations of the parties to the Convention in relation to climate change. As regards the substance, one of the major challenges of this procedure lies in the relationship between the law of the sea and climate law. While the latter body of rules is not the only one to be relevant - international human rights law could also be usefully

19 Juan Auz, Thalia Viveros-Uehara, Another Advisory Opinion (n 15). ; Sandrine Maljean-Dubois, 'À quand un contentieux interétatique sur les changements climatiques?' (2021) Questions of International Law, vol. 85, 17-28, p. 27.

20 Benoit Mayer, 'International advisory proceedings on climate change' (2023) Michigan Journal of International Law, n 44, 41–115. The fact that ITLOS then encourages broad participation by States and organisations in the written and oral proceedings nevertheless ensures that all points of view will be expressed and compensates for the lack of representativeness of the entity making the request, since oral proceedings are not mandatory before ITLOS (Article 133(4) of the Rules). Nevertheless, in the advisory opinion requested by the SRFC, the Tribunal clearly emphasised the relative scope of the opinion, which would be limited ratione personae to the organisation making the request and its Member States. Alina Miron, 'COSIS Request for an Advisory Opinion (n 8), 264-265.

21 *SRFC* (n 5), 40.

22 According to which 'The jurisdiction of the Tribunal comprises all disputes and all applications submitted to it in accordance with this Convention and all matters specifically provided for in any other agreement which confers jurisdiction on the Tribunal'. See also art 16: 'The Tribunal shall frame rules for carrying out its functions. In particular it shall lay down rules of procedure'.

23 Written observations of the Popular Republic of China, 15 June 2023, 5-25.

24 Written observations of India, 5 ff.

25 Written observations of the Federal Republic of Brazil, 15 June 2023, 5 ff.

26 Art. 138 of the Rules of the Tribunal.

mobilized in view of its recent developments[27] - it remains the main tool at the Tribunal's disposal for interpreting the UNCLOS provisions in the light of climate change. The way in which the Tribunal mobilizes climate instruments and standards will then largely determine the interpretation it makes of the nature, scope and extent of the obligations of the Parties to the Convention concerning the preservation of the marine environment, in a context of climate change.

Pascale RICARD

27 HRC, *Daniel Billy and others v Australia (Torres Strait Islanders Petition)*, views adopted by the Committee under article 5 (4) of the Optional Protocol, concerning communication No. 3624/2019 23 Sept. 2022 (§3.2). The Committee decided, in this case, to have a systemic interpretation of States obligations, declaring interestingly that 'State party's obligations under international climate change treaties constitute part of the overarching system that is relevant to the examination of its violations under the Covenant', referring to Article 31 of the Vienna Convention on the Law of Treaties. See also the written contributions the Democratic Republic of Congo and of Mauritius.