



# CHALLENGES AND OPPORTUNITIES IN REGIONAL GOVERNANCE OF OCEAN ECOSYSTEMS

EDITED BY: Lucia Fanning, Robin Mahon and Sebastian Unger  
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# CHALLENGES AND OPPORTUNITIES IN REGIONAL GOVERNANCE OF OCEAN ECOSYSTEMS

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# Editorial: Challenges and opportunities in regional governance of ocean ecosystems

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## KEYWORDS

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## Editorial on the Research Topic

Challenges and opportunities in regional governance of ocean ecosystems

It has become increasingly clear that the regional and sub-regional levels are critical components of multilevel ocean governance spanning local to global levels. Recently, the 2030 agenda and SDG 14 have further focused attention on the importance of regional initiatives. Yet our understanding of what is in place for ocean governance in the many marine regions that comprise the global oceans is in the early stages. The transboundary arrangements that cover issues relating to sustainable use of ocean ecosystems, their effectiveness, the interactions among them, the roles of the various actors that comprise them and how they relate to the local, national and global levels below and above are all areas that require concerted effort for improved understanding and sharing of lessons learned. In this Research Topic we have sought to explore these topics in greater detail with the aim of furthering our understanding and pointing the way to the research that is needed to make overall global ocean governance more effective. Several papers use examples from the different regional ocean areas while others explore crosscutting topics. Connections between regional governance and Areas Beyond National Jurisdiction (ABNJ) are also explored.

Focusing on the interplay between national and regional ocean policies, [Hills et al.](#) examined the extent to which ocean governance has evolved in the Solomon Islands from 1999–2018, given the potential synergies between national efforts for an integrated National Ocean Policy (NOP) and regional level policy development. Despite some overlapping, the authors concluded the effect of the NOP is one of repetition and consolidation rather than extending or evolving ocean policy in the Solomon Islands.

For the Eastern Tropical Pacific [Enright et al.](#) explain how, in the absence of a coherent, overarching regional ocean governance framework, four coastal States (Ecuador, Costa Rica, Colombia, and Panama) came together to create a regional cooperation

mechanism for the conservation and sustainable use of marine biodiversity. They reflect on challenges encountered and on the implications of the new Biodiversity Beyond National Jurisdiction (BBNJ) Agreement for the mechanism. In the Southeast Atlantic [Naidoo et al.](#) build on a substantial body of knowledge and experience in the Benguela Current Large Marine Ecosystem (LME) to explore the extent to which governance there can be considered to be polycentric. Their multilevel approach encompasses both national and regional levels and examines further opportunities for polycentric governance mechanisms in that area. In the Wider Caribbean Region (WCR) [Fanning et al.](#) draw on more than two decades of effort to implement regional ocean governance supported by the Global Environment Facility (GEF) to elucidate key challenges. These include limited financial resources along with capacity, leadership and political support at the country level, impacting meaningful engagement with regional level processes. The authors found these barriers to be persistent throughout the period examined, reaffirming the long-term commitment needed from GEF if the benefits expected by participating countries are to be achieved. Also in the WCR [Mahon and Fanning](#) focus on the science-policy interactions influencing regional ocean governance. Given most countries in the region are small with limited science capacity, the authors flagged the need to address science-policy interactions explicitly and to foster boundary spanning activities that connect providers and consumers of scientific knowledge.

Moving away from specific national and regional examples, [Adewumi](#) examined different ocean policy domains within an African context, using previously published criteria to explain relationships influenced by the context and concerns arising in the regional-global nexus. The author's assessment reiterates the importance of healthy regional-global governance relations as a way to ensure the sustainability of the ocean and the ecosystem services it provides. At the programmatic level [Degger et al.](#) evaluate the GEF efforts to promote regional ocean governance through the LME approach and its associated Transboundary Diagnostic Analysis and Strategic Action Planning (TDA-SAP) processes. They identify lessons learned across several different regions.

At the level of ABNJ [Gjerde and Yadav](#) consider the implications of polycentricity for effective governance. They outline critical needs for effective governance of ABNJ overall, but also specifically for the enhancement of regional capacity to engage with governance of ABNJ. Still within ABNJ [Freestone](#) examines the challenges encountered with establishing a High Seas protected area for the Sargasso Sea. He emphasizes the complexity of this endeavor and highlights the role that adjacent countries can play in High Seas conservation.

The Marine Regions Forum, a global level initiative to promote regional ocean governance is evaluated by [Weiand et al.](#) The Forum was designed specifically as an inclusive dialogue and exchange platform for diverse actors from marine regions that provided an informal space for joint learning and for supporting regional action

and international governance processes alike. This paper concludes by discussing the value added of transparent and inclusive collaborative processes in the transformation of ocean governance toward achieving sustainability.

[Christiansen et al.](#) elaborate on options for stronger governance integration and the development of a coherent and collaborative interplay between the International Seabed Authority (ISA) and the BBNJ Agreement. They explore the potential of Regional Environmental Management Plans (REMPs) established by the ISA to contribute to global biodiversity conservation, and the opportunity for the proposed BBNJ Instrument to promote overarching coherence to biodiversity conservation in ABNJ, premised on an ecosystem approach to management. They conclude that the proposed BBNJ Instrument could have a pivotal role to streamline multilateral action for the conservation of biodiversity in ABNJ by adopting an ambitious, overarching environmental vision and strategic goals.

In closing we note that the range of topics that must be addressed in order to better understand the role of regional ocean governance in sustainable use of the global ocean is well reflected in the background papers for [Interactive Dialogues](#) of the 2022 UN Ocean Conference. This indicates that ideas of multilevel governance and the importance of the regional level in achieving SDG14 and other ocean related SDGs are being mainstreamed into conceptualizing and planning for sustainable use of the oceans. The [Conference Declaration](#) underscores that view. In that context, the papers in this Research Topic take on particular value in illustrating the kind of research needed to support regional approaches to ocean governance and their interaction with global to local levels.

## Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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# Challenges to Implementing Regional Ocean Governance in the Wider Caribbean Region

**Lucia Fanning<sup>1\*</sup>, Robin Mahon<sup>2</sup>, Sanya Compton<sup>2</sup>, Chris Corbin<sup>3</sup>, Patrick Debels<sup>4</sup>, Milton Haughton<sup>5</sup>, Sherry Heileman<sup>6</sup>, Nicole Leotaud<sup>7</sup>, Patrick McConney<sup>2</sup>, Manuel Perez Moreno<sup>8</sup>, Terrence Phillips<sup>9</sup> and Cesar Toro<sup>10</sup>**

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For over two decades, the countries, subregional and regional level intergovernmental organizations in the Wider Caribbean Region (WCR) have been engaged in an initiative to implement a regional governance approach for managing the shared living marine resources of the Caribbean Sea and adjacent regions. Given the inherent socio-economic and geopolitical complexity of the region, this approach has been recognized as essential to address the challenges associated with the interconnected nature of shared ecosystem goods and services upon which countries in the region depend. This paper uses a retrospective lens to shed light on the challenges confronting the region and its efforts to overcome them. It is based on the Large Marine Ecosystem Governance Framework developed specifically for the WCR in 2006 and characterized as “learning by doing.” Data were obtained for this study through desktop review of published literature documenting progress over the period 2001–2021 and insights requested from 15 key individual and institutional contributors involved in the initiative. While the lack of financial resources was an underpinning and cross-cutting issue, key constraints identified were categorized as institutional, capacity building, awareness raising, leadership, legal, political, social capital, or socio-cultural. They include national capacity to engage with regional level processes due to a variety of factors including funding, political, and institutional challenges of developing a regional coordination mechanism, engaging the broader ocean community to create the critical mass needed, the difficulty of mainstreaming ocean affairs into high level political and decision-making fora and the scarcity of local, national and regional technical and political champions. This paper advances understanding of the barriers to be overcome in highly complex socio-politically developing regions if regional ocean governance initiatives are to play the essential role identified in the 2030 Sustainable Development Agenda, reaping the sustainable benefits of a blue economy.

**Keywords:** ecosystem-based management, constraints, shared living marine resources, Large Marine Ecosystem, Caribbean, multi-level governance

## INTRODUCTION

Evidence supporting a regional approach for managing transboundary ocean space, especially within enclosed and semi-enclosed seas, has been growing over the past few decades (Sherman, 1999; Fanning et al., 2009; Sherman and Hempel, 2009; Chung, 2010; Rochette et al., 2015; Duda, 2016; Billé et al., 2017; Langlet, 2018; Cavallo et al., 2019). More recently, strengthening institutional capacity at the regional level has been identified as essential for achieving the United Nations 2030 Agenda for Sustainable Development (UN, 2015) and for pursuing initiatives targeting a blue economy (World Bank and UN-DES, 2017; Keen et al., 2018; Garland et al., 2019; UNGA, 2020). Additionally, the benefits of countries adopting a regional approach for resolving transboundary issues, particularly those affecting shared living marine resources (sLMRs) and for pursuing marine ecosystem-based management (EBM) have also been recognized (Fanning et al., 2011). Contributing to an understanding of the current level of regional uptake to help meet these expectations, Mahon and Fanning (2019b) identified 20 regional clusters comprising governance arrangements related to EBM across the global ocean space. Of these, only four (Arctic, Antarctic, Pacific Islands Region, and South-East Pacific) were considered to have the integrating and coordinating institutional mechanisms needed to facilitate EBM (Mahon and Fanning, 2019a). The authors' assessment of the Western Central Atlantic region which comprised the Wider Caribbean Region (WCR) indicated the absence of an overarching regional integration mechanism "despite there being several regional and subregional mechanisms for fisheries and environment." (Mahon and Fanning, 2019a, p.5).

Efforts have been underway for over two decades by the countries, subregional and regional level intergovernmental organizations in the WCR to develop an integrated regional approach to governing sLMRs (CLME Project, 2011; Mahon et al., 2014; McConney et al., 2016; Debels et al., 2017). This paper explores factors thought to be hindering the achievement of this goal. We use a retrospective lens to shed light on the challenges confronting the region and its efforts to overcome these barriers, based on the Large Marine Ecosystem (LME) Governance Framework developed specifically for the WCR in 2006 and characterized as "learning by doing" (Fanning et al., 2007). We begin by setting the context for the research with a brief overview of the WCR, the rationale behind a regional integrated approach for addressing transboundary issues and a description of the evolution of efforts over the past two decades, hereafter referred to as the Caribbean Large Marine Ecosystem (CLME) initiative. This is followed by an assessment of the constraining factors identified from a desktop review of published literature from the CLME Initiative over its 20 year history as well as insights provided by key contributors involved during each phase of the initiative. The paper concludes with a discussion on how the lessons learned from the WCR can shed light on the contribution regional initiatives can make to achieving the 2030 SDGs and to reaping the sustainable benefits of a blue economy. The findings are not only relevant for the WCR as it continues to pursue regional ocean governance but also to advancing

understanding of potentially similar barriers and solutions in other developing regions of high socio-political complexity.

## SETTING THE CONTEXT

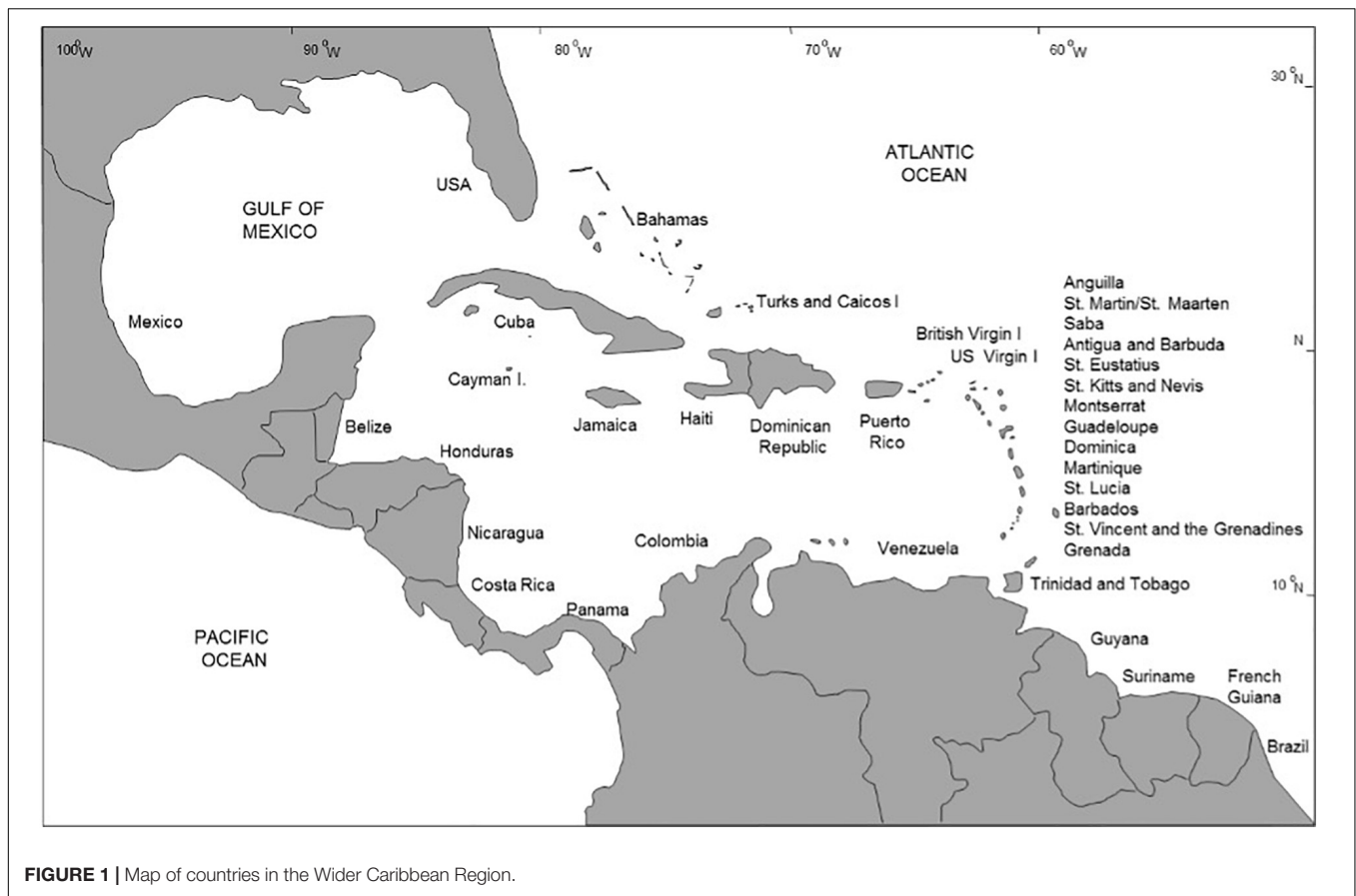
As an ocean management area, the WCR is defined in the 1983 Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (referred to as the Cartagena Convention) as "the marine environment of the Gulf of Mexico, the Caribbean Sea and areas of the Atlantic Ocean adjacent thereto, south of 30° north latitude and within 200 nautical miles of the Atlantic coasts of States referred to in article 25 of the Convention." (Article 2, paragraph 1). As defined in the Convention, this marine area is bordered by 28 sovereign states and 18 overseas territories of France, United Kingdom, United States of America (USA), and The Netherlands. It extends from French Guiana in the south to Cape Hatteras, United States in the north, the Caribbean countries of Central America in the west and all of the insular Caribbean countries and territories. While Brazil is not considered part of the Cartagena Convention area, it is a member of the Western Central Atlantic Fisheries Commission (WECAFC) of the UN Food and Agriculture Organization (FAO). It is also a member of the Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE) of the Intergovernmental Oceanographic Commission (IOC) of UNESCO. Additionally, given the significant biogeophysical influence of Northern Brazil on parts of the WCR and the marine ecosystems shared with other countries of the North Brazil Shelf LME (NBSLME), the importance of including Brazil in efforts to develop and implement mechanisms aimed at fostering regional ocean governance becomes evident. This was further recognized in 2001 by the Global Environment Facility International Waters (GEF-IW) program which agreed to financially support a regional project focusing on the governance processes needed to sustainably manage sLMRs of the CLME and adjacent areas, with the latter referring specifically to the NBSLME<sup>1</sup>. As the GEF-IW program has provided separate funding to address issues in the Gulf of Mexico LME, this paper limits its focus to ongoing collaborative efforts aimed at building and strengthening regional ocean governance processes within the CLME and NBSLME (Figure 1) since 2001.

## Making the Case for Regional Ocean Governance in the WCR

The Wider Caribbean Region and in particular the Caribbean LME was assessed as one of the most geopolitically complex regions in the world (Mahon et al., 2010a). In addition to having countries among the largest (United States and Brazil) to the smallest (St. Kitts and Nevis) and spanning those among the richest to the poorest (United States and Haiti), there are 16 Small Island Developing States (SIDs)<sup>2</sup> within the region. These are recognized as being significantly challenged with "limited resources, susceptibility to natural disasters, vulnerability to

<sup>1</sup><http://lme.edc.uri.edu/index.php>.

<sup>2</sup><https://www.un.org/esa/sustdev/sids/sidslst.htm#Latin>.



external shocks and excessive dependence on international trade” (United Nations Department of Economic and Social Affairs (UNDESA), 2017), among other factors limiting sustainable development (Bernal, 2001). With a population of approximately 93 million living within 100 km of the coast of the CLME and NBSLME (CLME + PCU, 2020), the goods and services from these ecosystems have been critically important for ensuring livelihoods, food security and the wellbeing of the people of the region (Fanning et al., 2007; UNEP, 2016). Most tangible are fisheries and tourism, but cultural, recreational, and spiritual aspects are also of great significance (Mahon et al., 2014). When the semi-enclosed nature of the Caribbean Sea and the large number of countries sharing the basin are taken into account, the need to collaboratively address transboundary threats to these goods and services becomes paramount (Debels et al., 2017).

## Deteriorating Condition of the Wider Caribbean Region

Prior to and since 2001, numerous studies have documented the deteriorating condition of the coastal and marine ecosystems and the potential loss of benefits to the people of the WCR. They highlighted the need for collaboration to reverse the trend. At the national level, collaboration included the growing demand for integrated coastal zone management as exemplified in Barbados (CZMU, n.d.; Scruggs and Bassett, 2013), Belize

(CZMAI, n.d.; Verutes et al., 2017), and Cuba (Hernandez, 1999; Gerhartz-Abraham et al., 2016). At the subregional level, the Caribbean Community (CARICOM), comprised primarily of former British colonies, the Central American Integration System (SICA for its Spanish acronym) representing countries in Central America and the Dominican Republic, and the Organization of Eastern Caribbean States (OECS) with its current 11 members, each began to focus attention on threats to the marine environment and their impacts on the socio-economic well-being of their member countries. At the regional level, among several intergovernmental organizations with a mandate on oceans, the United Nations Environment Programme (UNEP) was spearheading the adoption of the Cartagena Convention and its protocols in recognition of the growing need to balance development with protection of the Caribbean marine environment. Other UN organizations responsible for fisheries (WECAFC/FAO), shipping (IMO), and ocean science (IOCARIBE of IOC UNESCO) were also drawing attention to regional impacts arising from increased overfishing, land and marine-based sources of pollution, biodiversity loss and habitat degradation, with climate change adding another layer of uncertainty. Lastly, a number of non-governmental organizations (NGOs) in partnership with countries and international organizations were also drawing attention to the status of coastal and marine ecosystems in the region, such as the International Coral Reef Initiative (Jackson et al., 2014). These

and other studies (e.g., Agard and Cropper, 2007), along with efforts by the Association of Caribbean States updating a UN General Assembly (UNGA) Resolution in 2006 (A/RES/61/197) declaring the Caribbean Sea as a special area in the context of sustainable development, confirmed growing concerns over the impacts anthropogenic activities were having on the Caribbean Sea (Singh and Mee, 2008). They also raised the level of awareness regarding the need for a region-wide, ecosystem-based approach and funding resources to better understand and manage these impacts (Fanning et al., 2011).

## Evolution of the CLME Initiative: 2001–2021

### PDF-A Phase: 2001–2005

Funding efforts for this phase of the CLME initiative gathered additional momentum in 2001<sup>3</sup> with the submission of a proposal to the GEF-IW programme under a *Project Preparation and Development Facility* grant, referred to as the PDF-A phase of the GEF Project Cycle (GEF, 2003; **Table 1**). This process was endorsed by representatives of five GEF-eligible countries<sup>4</sup> and facilitated by IOCARIBE of IOC UNESCO as the regional executing agency, with the United Nations Development Programme (UNDP) serving as the implementing agency (UNDP/GEF, 2001). Making the case for the largely piecemeal and uncoordinated approaches from countries and

organizations to reverse trends in degradation (Fanning et al., 2009), the project concept, entitled *Sustainable Management of the Shared Marine Resources of the Caribbean Large Marine Ecosystem (CLME) and Adjacent Regions* was accepted into the GEF pipeline in 2003. Following acceptance, a funding proposal for the preparation of a full-sized project proposal, referred to as the *Project Preparation and Development Facility—B* (PDF-B) phase, was completed. Led by IOCARIBE of IOC UNESCO, this required and received endorsement by 15 eligible countries<sup>5</sup> in the region, prior to its submission to the GEF-IW program by UNDP in 2005 and its subsequent approval for funding.

### PDF-B Phase: 2006–2007

This phase of the CLME Initiative began implementation in 2006 following approval of US \$700,000 from the GEF along with co-financing commitments of US \$213,000 from project partners (**Table 1**). The project was designed to obtain information on key transboundary issues affecting living marine resources and their root causes, leading to the submission of a full-sized project proposal to the GEF (UNDP/GEF, 2005). Over an estimated 18 months, the specific activities focused on developing a shared vision and approach for the full-sized project. The overall objective was the sustainable management of sLMRs in the CLME and adjacent regions through an integrated management approach that will meet World Summit on Sustainable Development (WSSD) targets for sustainable fisheries. The PDF-B phase included the preparation of a preliminary Transboundary Diagnostic Analysis (TDA) to identify the major transboundary issues affecting the sLMRs in the WCR and their root causes. Given the extent and

<sup>3</sup>In 1995 and 1997, Member States of IOCARIBE of IOC UNESCO adopted Recommendation (SC-IOCARIBE-V.4) supporting the establishment of a Caribbean LME monitoring and assessment programme and Recommendation SC-IOCARIBE-VI.5, where it agreed to continue supporting the development of project proposals for the Caribbean LME for submission to the GEF for funding. The recommendations were subsequently approved by the senior executive branches of the IOC.

<sup>4</sup>Barbados, Cuba, Jamaica, Mexico, Venezuela.

<sup>5</sup>Antigua and Barbuda, Barbados, Belize, Costa Rica, Dominica, Guatemala, Guyana, Haiti, Jamaica, Nicaragua, Panama, St. Kitts and Nevis, St. Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago.

**TABLE 1** | GEF-IW program submission and funding timeline.

| Project phase               | Time period    | GEF process  | GEF funding                    | Co-financing     |
|-----------------------------|----------------|--|--------------------------------|------------------|
| PDF-A                       | August 2001    | PDF-A concept document submitted to GEF            | US\$ 18,836                    | US\$ 16,844      |
|                             | June 2003      | Concept accepted into the GEF pipeline             |                                |                  |
|                             | January 2004   | PDF-B project proposal submitted to countries      |                                |                  |
|                             | July 2005      | PDF-B project proposal endorsed by countries       |                                |                  |
|                             | August 2005    | PDF-B project proposal approved by GEF             |                                |                  |
| PDF-B                       | April 2006     | PDF-B project implemented                          | US\$ 700,000                   | US\$ 213,000     |
|                             | November 2007  | Full-Sized Project proposal endorsed by countries  |                                |                  |
|                             | November 2007  | Full-Sized Project proposal submitted to GEF       |                                |                  |
|                             | April 2008     | Full-sized project approved by GEF                 |                                |                  |
|                             | May 2009       | First full-sized project implemented               |                                |                  |
| Full-Sized Project 1 (FSP1) | May 2013       | Strategic Action Programme endorsed by countries   | US\$ 7,008,116<br>US\$ 450,000 | US\$ 47,591,111  |
|                             | August 2013    | Second full-sized project concept submitted to GEF |                                |                  |
|                             | September 2013 | Second full-sized project preparation approved     |                                |                  |
|                             | November 2013  | Concept approved by GEF                            |                                |                  |
|                             | March 2015     | Second full-sized project document approved by GEF |                                |                  |
| Full-Sized Project 2 (FSP2) | May 2015       | Second full-sized project implemented              | US\$ 12,500,000                | US\$ 134,153,695 |
|                             | October 2018   | Mid-term review                                    |                                |                  |
|                             | October 2021   | Expected conclusion                                |                                |                  |
| Total funding               |                |  | US\$ 20,676,952                | US\$ 181,974,650 |

diversity of the WCR, three TDAs were conducted focusing on the Insular Caribbean, the Western Central American area and the Guianas-Brazil subregion. The project also developed a preliminary Strategic Action Programme (SAP) that examined the current transboundary living marine resources governance gaps and recommendations on actions needed in the full-sized project in order to achieve the overall project objective. The preliminary SAP identified weak multi-level governance as a root cause of these transboundary issues. This led to the development of the “made in the Caribbean” LME Governance Framework which was endorsed by the countries to be applied in the Full-Sized Project (FSP) as the basis for understanding and testing solutions aimed at improving transboundary living marine resource governance (Fanning et al., 2007).

### First Full-Sized Project (FSP1) Phase: 2009–2014

The Full-Sized Project document generated from the PDF-B phase was endorsed by 23 GEF-eligible countries<sup>6</sup> and was approved in 2008 by the GEF for US \$7,008,116 (UNDP/GEF, 2008). Co-financing commitments by partners totaled US \$47,591,111 (Table 1). Key objectives were to update the preliminary TDAs to agree on the major issues confronting the region's marine environment and sLMRs, and their root causes; and to develop a 10 year SAP for sustainably managing these resources in the CLME and its adjacent regions. The project, more commonly referred to as the *CLME Project*, had three additional objectives: to improve the shared knowledge base needed to address the identified issues; to finalize the actions in the SAP required to achieve legal, institutional and policy reforms to support transboundary LMR management; and, to develop an institutional and procedural approach to LME level monitoring, evaluation, and reporting (UNDP/GEF, 2008). Based on advice from the Technical Task Team early in this phase of the project, updating the TDAs shifted focus from geographical sub-regions to EBM of the three major fisheries ecosystems, namely coral reef, continental shelf and pelagic ecosystems (Heileman, 2011; Phillips, 2011). Within these ecosystems, the priority transboundary issues were confirmed to be unsustainable exploitation of fish and other living resources, pollution and habitat degradation/biodiversity loss, with climate change impacts as crosscutting. Using the knowledge acquired from the TDAs and causal chain analyses, the final SAP focused on an ecosystem-based proposal for fisheries governance that addressed local, national and regional needs (Debels et al., 2017).

### Second Full-Sized Project (FSP2) Phase—2015–2021

With the endorsement of the SAP by 21 GEF-eligible countries<sup>7</sup> and the United States at the conclusion of the FSP1 phase, the

second FSP entitled *Catalyzing Implementation of the Strategic Action Programme for the Sustainable Management of shared Living Marine Resources in the Caribbean and North Brazil Shelf Large Marine Ecosystems* (referred to as the CLME + Project) was submitted for funding to the GEF (UNDP/GEF, 2015). The project proposal was developed with a US \$450,000 preparation grant and focused on implementing the first 5 years of the 10 year SAP developed during the FSP1 phase. Funding to implement the project was approved in March 2015 for US \$12,500,000 (GEF, 2020a), supported by co-financing from partners of US \$134,153,695 (Table 1). The project's five components aimed at: (i) strengthening institutional, policy and legal frameworks for transboundary LMR governance; (ii) enhancing institutional capacity to implement ecosystem-based management (EBM) for the shared LMRs in the region; (iii) reducing environmental stress and enhancing livelihoods through piloting the implementation of EBM using specific case studies that allow for replication and upscaling; (iv) identifying high priority investment needs and feasible opportunities to address the sustainable management of shared living marine resources; and (v) monitoring, evaluating and sharing lessons on the overall implementation of the SAP (GEF, 2020b).

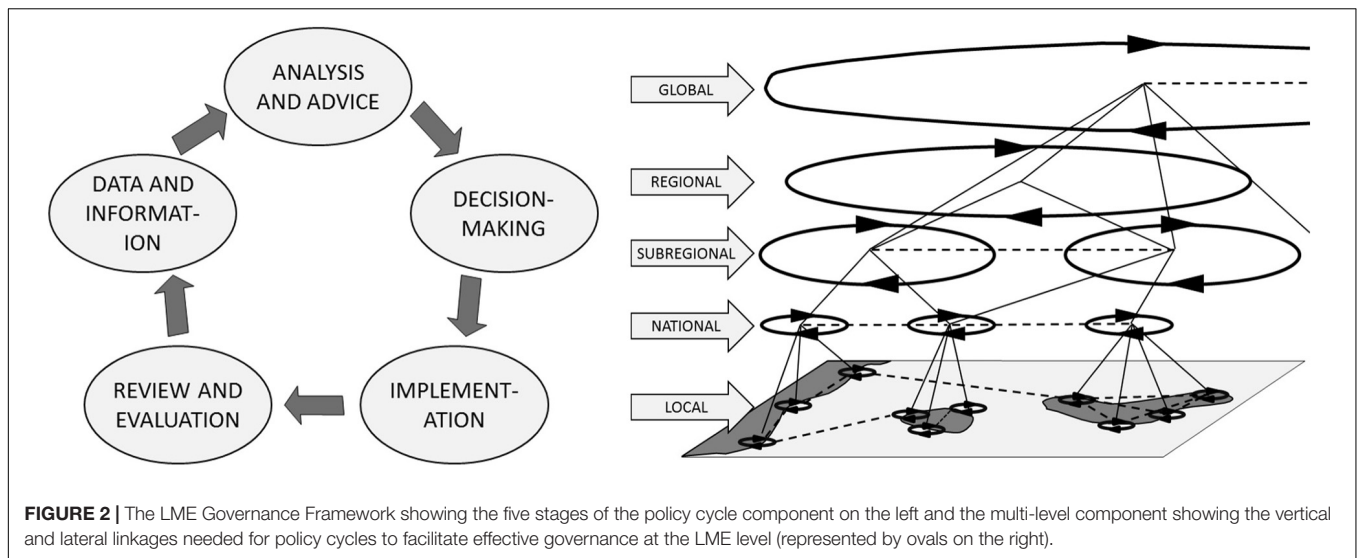
## MATERIALS AND METHODS

### LME Governance Framework

The LME Governance Framework developed during the PDF-B phase is used in this study to structure the identification of constraints during each phase of the four GEF-funded phases of the CLME initiative (Fanning et al., 2007). The framework addresses two key components of LME governance, namely the iterative policy cycle process by which informed decisions are made, implemented and reviewed and the multi-level, multi-scalar jurisdictional, spatial, temporal, and ecological nature of LMEs (Figure 2). To apply the framework, the policy cycle for each of the issues identified as affecting regional ocean governance in the WCR can be assessed by knowledgeable stakeholders for its functionality at each stage and for linkages between stages to determine the level of completeness of the policy cycle. For example, is the data and information needed for analysis and advice to inform decision making appropriate and are all those who have data and information involved? Are decisions implemented, monitored and evaluated for their effectiveness? This is followed by an examination of the connectivity between these decision-making processes vertically across jurisdictions (e.g., is the policy cycle relating to fisheries decision-making at the national level linked to those at the local and regional levels) and laterally at each jurisdictional level within the region. As described by Fanning et al. (2007), any disruption in moving through the five stages of the policy cycle (data and information, analysis and advice, decision-making, implementation, and review and evaluation), can result in incomplete cycles leading to poor governance. Additionally, recognizing that a variety of decision-making processes will be occurring at the different jurisdictional levels of the LME, the framework facilitates assessment of any barriers

<sup>6</sup> Antigua and Barbuda, Bahamas, Barbados, Belize, Brazil, Colombia, Costa Rica, Dominica, Dominican Republic, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, St. Kitts and Nevis, St. Lucia, Saint Vincent and the Grenadines, Suriname, and Trinidad and Tobago.

<sup>7</sup> Antigua and Barbuda, Barbados, Belize, Brazil, Colombia, Costa Rica, Dominica, Dominican Republic, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Panama, St. Kitts, and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago. Note that as of June 2019, the CLME + Project website (<https://www.clmeproject.org/sap-overview/>) indicated the Bahamas, Cuba and Nicaragua, along with France and the United Kingdom had also endorsed the SAP.



inhibiting the lateral and vertical linkages needed to facilitate effective governance at the LME level. Lastly, the framework provides for a review of the adequacy of the coverage of available information being used in each stage of the policy cycle and at each level, based on the degree of engagement by stakeholders having the knowledge needed to inform the process. Additional details on applying the framework using three different resource management situations in the WCR are provided in Fanning et al. (2013).

## Data Collection and Analysis

Data obtained for this study included a desktop review of published material (peer-reviewed and non-peer reviewed project-related documentation) over the period 2001–2021 and retrospective insights requested in 2020 from 15 individual and institutional contributors involved in the various phases of the CLME Initiative. Although extremely knowledgeable and engaged at various stages of the CLME initiative, the information provided by these contributors reflects their perceptions of constraints and should not be interpreted as representing the views of all stakeholders engaged in the CLME initiative. As a GEF-funded project, the required written project-related documentation for each phase of the initiative is specified by the GEF and is publicly available. These documents were obtained from three major sources: the GEF project database website<sup>8</sup>, the Knowledge Management Hub established under the CLME + Project<sup>9</sup> and the repository available at the UWI-CERMES website<sup>10</sup>. Two peer-reviewed published papers providing overviews of the GEF-funded projects to 2013 (Mahon et al., 2014) and to 2016 (Debels et al., 2017) were also used to obtain additional insights regarding constraints and efforts to address them. Major project-related documents reviewed are listed in Table 2. Data from contributors were obtained

individually by first sending a request for expression of interest to regional level governmental and non-governmental institutional representatives, academics and consultants who were identified as involved in the CLME initiative over its 20 year period. Based on a positive response, the template provided in Table 3 was emailed to each recipient. All data received were transferred to an Excel spreadsheet for subsequent qualitative content analysis. The analytical results were then shared with contributors for feedback on the thematic assignment of the constraints, which received their agreement. Feedback provided from institutional contributors (UNEP, IOC/ARIBE, FAO, CRFM, OSPESCA, CANARI, UWI-CERMES)<sup>11</sup> represented their individual views and not those of their organizations.

Data on perceived challenges collected from contributors were analyzed using standard qualitative content analysis techniques that include the identification of categories or themes emerging from the responses (Hsieh and Shannon, 2005). A summary of the steps includes (a) identifying key words or codes to look for in the data that relate to the unit of analysis; (b) develop rules for the key words codes that ensure consistency; (c) coding the text according to the developed rules; (d) examine the results for patterns; (e) draw inferences based on the patterns. The analysis resulted in each perceived constraint being categorized into one of the following categories: institutional; awareness building; leadership; socio-cultural; capacity building; political; social capital; legal. Constraints that were identified by more than one participant for a given phase were counted as a single constraint for that phase of the CLME initiative. However, the same constraint identified for more than one phase was counted separately in each of the phases for which it was mentioned. Each constraint was then evaluated on the basis of how it affected the

<sup>8</sup><https://www.thegef.org/projects>

<sup>9</sup><https://clmeplus.org>

<sup>10</sup><https://www.cavehill.uwi.edu/cermes/news/technical-reports.aspx>

<sup>11</sup>UNEP-United Nations Environment Programme; IOC/ARIBE-IOC-Sub Commission for the Caribbean and Adjacent Regions; FAO-Food and Agriculture Organization; CRFM-Caribbean Regional Fisheries Mechanism; OSPESCA-Organización del Sector Pesquero y Acuicola del Istmo Centroamericano; CANARI-Caribbean Natural Resources Institute; UWI-CERMES-University of the West Indies Centre for Resource Management and Environmental Studies.

**TABLE 2 |** List of reviewed project-related documents.

| PDF-A project<br>2001–2005          | PDF-B project<br>2006–2008   | First full-sized<br>project (FSP1)<br>2009–2014         | Second full-sized<br>project (FSP2)<br>2015–2021 |
|-------------------------------------|--|---|--|
| PDF-A project<br>document<br>(2001) | PDF-B project<br>document (2005)   | First full-sized project<br>document (2008)             | Second full-sized<br>project document<br>(2015)  |
| Pipeline<br>Concept Paper<br>(2003) | Fisheries<br>Governance report<br>(2007) and Living<br>Marine Resource<br>Governance<br>focusing on<br>Non-extractable<br>Resources report<br>(2007) | Finalized TDA (2011)<br>Causal chain analysis<br>(2011) | Mid-term review<br>(2018)                        |
|                                     | Final<br>report—Project<br>concept/TDA<br>synthesis (2007)   | Fisheries ecosystems<br>governance (2012)               |  |
|                                     |  | Mid-term review (2012)                                  |  |
|                                     |  | Finalized SAP (2013)                                    |  |
|                                     |  | Terminal evaluation<br>(2013)                           |  |

Mahon et al. (2014) and Debels et al. (2017).

**TABLE 3 |** Data collection template identifying constraints at each phase of the GEF-supported CLME initiative.

|  | PDF-A<br>Project<br>2001–2005 | PDF-B<br>Project<br>2006–2008 | FSP1<br>Project<br>2009–2014 | FSP2<br>Project<br>2015–2021 |
|--|-------------------------------|-------------------------------|------------------------------|------------------------------|
| Constraint   |                               |                               |                              |                              |
| Stages of the policy cycle<br>affected                         |                               |                               |                              |                              |
| data and information   |                               |                               |                              |                              |
| analysis and advice  |                               |                               |                              |                              |
| decision making  |                               |                               |                              |                              |
| implementation   |                               |                               |                              |                              |
| monitoring and evaluation                                      |                               |                               |                              |                              |
| Relevant level(s) involved in<br>lateral and vertical linkages |                               |                               |                              |                              |
| Global   |                               |                               |                              |                              |
| National   |                               |                               |                              |                              |
| Regional   |                               |                               |                              |                              |
| Local  |                               |                               |                              |                              |
| Stakeholders involved  |                               |                               |                              |                              |

completeness of the relevant policy cycle, the need to strengthen or build vertical and/or lateral linkages among the relevant jurisdictional levels and the adequacy of pertinent stakeholder engagement. To ensure anonymity, the results obtained from analyzing each contributor's input were aggregated.

Using the constraints identified by each contributor, the project-related documentation for each phase of the initiative (Table 2) was examined to assess the extent to which the constraints perceived to be in place by the contributors had been identified and the attention given to addressing them. Every

document was analyzed using key words relating to the identified themes and constraints arising from the content analysis of the data provided by contributors.

## RESULTS

### Nature of the Identified Constraints

The categories of constraints and numbers of constraints in each category identified by contributors for each of the four phases of the GEF-funded initiative are illustrated in Figure 3. The number of different types of constraints ranged from a low of 10 in the PDF-B phase to a high of 18 in the second full-sized project, with institutional constraints being the most frequent across all four phases. Of particular interest is the increase in the category of constraints identified over time, ranging from six at the onset of the initiative in 2001–2005 to eight in the current 2015–2021 phase. Also noteworthy is the absence of the awareness building category of constraint during the first full-sized project (2009–2014), the only phase in which this category was not mentioned. Two new constraint categories, political and social capital, while not flagged by contributors for the PDF-A and PDF-B phases, were identified for both full-sized projects.

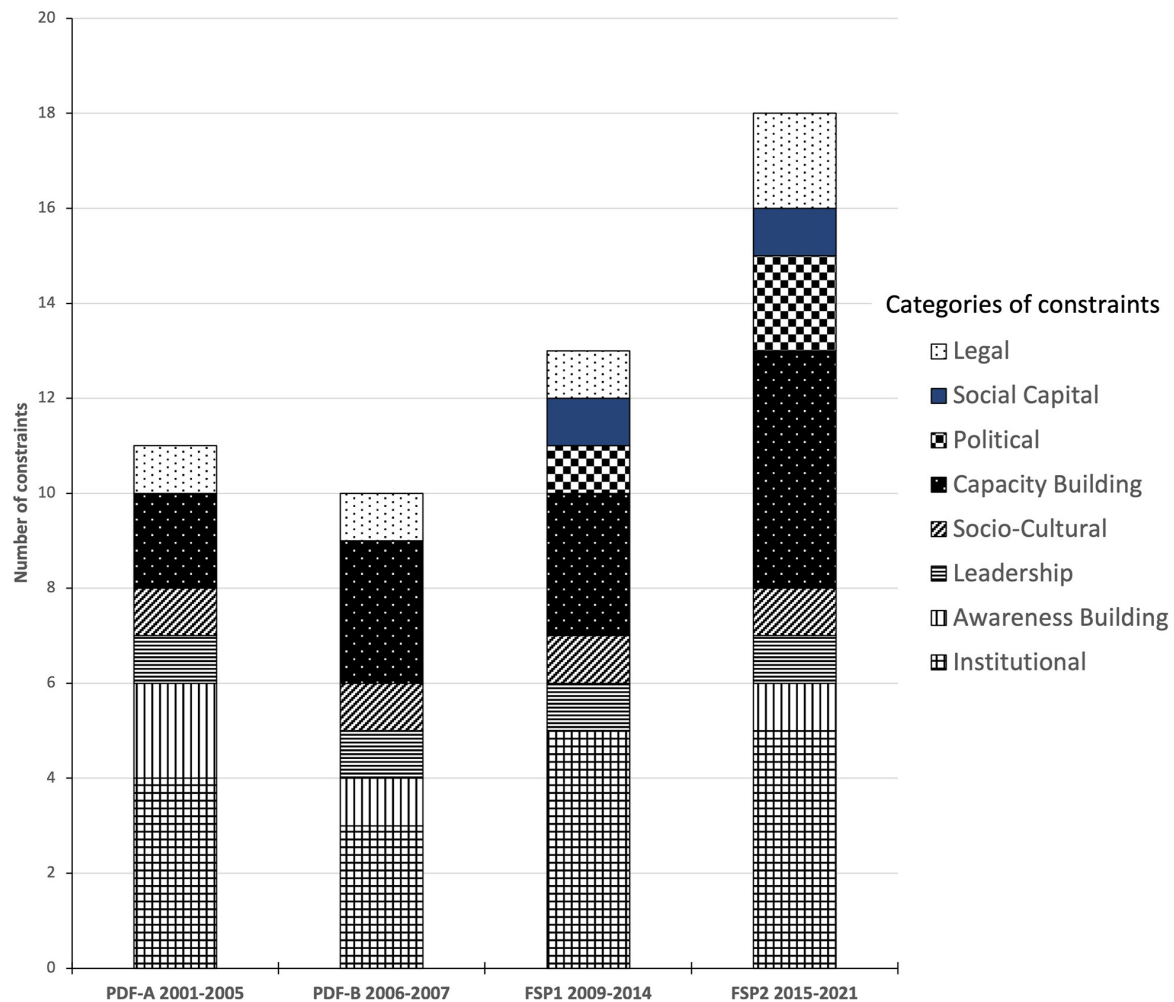
### Identified Constraints

A total of 29 constraints were identified by contributors covering the period from 2001 to 2021. Twelve (41%) were categorized as *institutional*, five (17%) as *capacity building*, four (14%) as *awareness building*, two each (7%) as *legal*, *leadership* and *political* and one each (3.5%) as *socio-cultural* and *social capital*. **Supplementary Table 1** provides details on constraints identified for each phase of the CLME initiative, highlighting those shared across each phase as well as constraints unique to each phase. Stages of the policy cycle most affected, status of vertical and lateral linkages as well as stakeholders involved are also provided for each constraint. **Table 4** provides a simplified representation of constraints across the four phases of the CLME initiative, described in greater detail in **Supplementary Table 1**.

### PDF-A Phase: 2001–2005

Constraints perceived by contributors during this initial phase of the initiative focused on the single sector nature of ocean management and governance among national level agencies and the inward perspective of countries in the region resulting in a preoccupation with national priorities over a more collaborative and visionary regional approach (Constraints 1–11, **Supplementary Table 1**). Challenges arising from differing levels of human and financial resources among countries, coupled with significant socio-cultural diversity as influenced by different colonial histories and languages were also flagged as constraints to sustainable management of shared living marine resources. During this phase, engagement of civil society and the private sector in decision making was identified retrospectively by contributors as undervalued by national governments.

Regarding the stages of the policy cycle, contributors noted that an absence of data and information, whether due to unavailability or inaccessibility, had the “domino effect” of



**FIGURE 3 |** Nature of constraints for each phase of the CLME initiative.

influencing all other stages of the policy cycle. Even when data were available and accessible, there was the perception of avoiding evidence-based decisions. In cases where sectoral planning was occurring, while the completeness of the policy cycle for some stakeholders such as governmental agencies appeared relatively high, contributors noted the lack of lateral linkages with other national agencies as constraining integrated efforts. No specific stage of the policy cycle could be assigned to addressing the challenge of socio-cultural diversity. Overall, when examining the identified constraints during the PDF-A phase (**Supplementary Table 1**), weak vertical linkages between national and regional levels contributed to the lack of support for an integrated regional approach and achieving consensus for regional ocean governance priorities. At the same time, non-existent to weak lateral linkages among sectors as well as civil society organizations (CSOs) contributed to poor interactive governance and the predominance of sector-based planning during this PDF-A phase. Additionally, stakeholders involved in ocean governance processes at the national and regional levels were primarily

governmental, with minimal contribution of civil society and the private sector.

### PDF-B Phase: 2006–2007

Seven of the 10 constraints perceived by contributors during this phase corresponded to those identified in the PDF-A phase (Constraints 5–11, **Supplementary Table 1**). This is not surprising since this phase was intended to conduct preliminary analyses aimed at identifying barriers to a regional approach rather than addressing constraints identified in the earlier phase. The three new constraints (Constraints 12–14, **Supplementary Table 1**) gave added attention to the lack of adoption of an ecosystem-based management approach. This is coupled with the lack of awareness of the transboundary implications of not adopting such an approach and the lack of capacity to adopt and implement regional and global multilateral ocean-related agreements. Given that the GEF had agreed to include the PDF-A concept note into its pipeline and to fund the PDF-B phase, the earlier constraint of the low priority given by donor organizations to integrated ocean-related projects in the

**TABLE 4 |** Distribution of constraints among the four phases of the CLME initiative by category and phase of the CLME initiative.

| Category          | Brief description of constraints  | PDF-A | PDF-B | FSP1 | FSP2 | Constraint # |
|-------------------|---|-------|-------|------|------|--------------|
| Institutional     | Lack of synergies among regional actors                                 |       |       |      |      | 1            |
|                   | Predominantly sector-based planning                                     |       |       |      |      | 4            |
|                   | Importance of civil society/private sector input                        |       |       |      |      | 5            |
|                   | Lack of integration across the main transboundary issues                |       |       |      |      | 12           |
|                   | Weak mechanisms for interactive governance                              |       |       |      |      | 10           |
|                   | Limited national intersectoral coordination mechanisms                  |       |       |      |      | 15           |
|                   | Lack of effective engagement of civil society                           |       |       |      |      | 16           |
|                   | Fisheries focus   |       |       |      |      | 17           |
|                   | Sharing and accessibility of data and information                       |       |       |      |      | 18           |
|                   | Limited national intersectoral coordination                             |       |       |      |      | 21           |
|                   | Lack of appropriate regional coordinating mechanism                     |       |       |      |      | 23           |
| Capacity building | Limited coordination among countries for transboundary issues           |       |       |      |      | 28           |
|                   | Limited country capacity for uptake from regional projects              |       |       |      |      | 7            |
|                   | Weak networking and collaboration among the civil society organizations |       |       |      |      | 9            |
|                   | Lack of capacity to implement regional and global ocean commitments     |       |       |      |      | 14           |
|                   | Inadequate communication strategy and plan CLME + project               |       |       |      |      | 26           |
| Awareness         | Inadequate strategy for engagement with private sector at all levels    |       |       |      |      | 27           |
|                   | Limited interest of donors in Caribbean ocean governance                |       |       |      |      | 2            |
|                   | Lack of national level understanding of importance of oceans governance |       |       |      |      | 3            |
|                   | Lack of understanding of implications of transboundary issues           |       |       |      |      | 13           |
|                   | Low national understanding of blue or ocean-based economy challenges    |       |       |      |      | 24           |
| Leadership        | Lack of an accepted regional vision                                     |       |       |      |      | 6            |
|                   | Lack broader development vision for the region.                         |       |       |      |      | 25           |
| Legal             | No harmonized regional targets  |       |       |      |      | 8            |
|                   | Weak national governance framework                                      |       |       |      |      | 22           |
| Political         | Decreasing interest in science-policy interfaces                        |       |       |      |      | 19           |
|                   | Exercise of power and influence by some countries                       |       |       |      |      | 29           |
| Socio cultural    | Diversity in culture, capacity, human development                       |       |       |      |      | 11           |
| Social capital    | Limited succession planning   |       |       |      |      | 20           |

region was considered addressed. Growing awareness of the importance of oceans governance and the LME Approach and the need for integrated planning among those participating in the project development and implementation were also perceived as addressed (Constraints 1–4, **Supplementary Table 1**).

As with the PDF-A phase, the need for relevant data and information and analysis and advice to assist with more informed decision making and implementation were identified as necessary to strengthen the policy cycle process for the three additional identified constraints (Constraints 12–14, **Supplementary Table 1**). Regarding the need to strengthen vertical and lateral linkages, attention was focused on the limited connectivity vertically from national, to subregional to regional, thereby constraining the development of a regional approach. Nonetheless, weak lateral linkages at all jurisdictional levels were also noted. Lastly, mainly governmental stakeholders continued to be involved in decision making processes during this stage.

#### First Full-Sized Project (FSP1) Phase: 2009–2014

Contributors identified 13 constraints during this FSP1 phase. Six of these were first perceived during the PDF-A phase (Constraints 6–11, **Supplementary Table 1**) and one was carried over from the PDF-B phase (Constraint 14, **Supplementary**

**Table 1**). Their persistence into the FSP1 phase reflects an ongoing perception of a lack of leadership to adopt a regional vision, limited valuing of civil society, and private sector input, ongoing limited capacity of national governments and civil society stakeholders and the inherent socio-cultural diversity of the region. Of the six new constraints identified (Constraints 15–20, **Supplementary Table 1**), four focused on institutional weaknesses that limit input from a cross section of ocean-related stakeholders to facilitate the TDA/SAP production (or preparation)—a key output of this phase. Specifically, contributors perceived the lack of integration of pollution and habitat degradation considerations in the growing attention being paid to fisheries. Of particular concern was the apparent growing unwillingness of institutional stakeholders to share data and information that they hold. Additionally, from a political perspective, the perception among most contributors was a varying interest in evidenced-based decision-making during this phase. Lastly, given the long-term commitment needed to sustainably manage sLMRs of the region and the challenges to be overcome, the absence of succession planning was perceived as a potentially significant constraint (Constraint 20, **Supplementary Table 1**). Three constraints identified in the PDF-B phase (Constraints 5, 12, and 13, **Supplementary Table 1**) were not mentioned by

contributors in this phase. These related to improvements in governments' recognition of the role of civil society and the private sector in ocean governance, growing though still weak efforts at integration across fisheries, pollution and habitat degradation/biodiversity and the need to adopt an LME approach to address these issues. This suggests contributors thought that progress was made during this period with intersectoral integration and adopting the LME approach to address transboundary issues.

The lack of completeness of policy cycles among all the constraints identified for this phase was noted (Constraints 6–11 and 15–20, **Supplementary Table 1**). The ongoing lack of cross-sectoral inputs through mechanisms such as National Intersectoral Committees (NICs) and directly from civil society and private sector organizations was also perceived to limit the scope or quantity and quality of data and information available to other stages of the policy cycle. Contributors also noted that vertical and lateral linkages were weak across all jurisdictional levels and sectors. However, in terms of regional level stakeholder involvement, they noted the positive yet limited trend of starting to engage CSOs and academia in processes related to regional ocean governance.

### Second Full-Sized Project (FSP2) Phase: 2015–2021

Eighteen constraints were perceived to be present during the almost completed FSP2 phase of the CLME initiative. Nine constraints were carried over from earlier phases. Among these, five identified in the PDF-A phase were thought to be persisting some 15–20 years later (Constraints 7–11, **Supplementary Table 1**). Contributors noted the continued limited intraregional ability to set harmonized targets addressing the three major transboundary issues, a continued need for capacity building and weak mechanisms for interactive governance. Also persisting was the constraint of socio-cultural diversity; one which cannot be removed, only accommodated. The perceived lack of capacity to implement multilateral agreements, noted in both the PDF-B and FSP1 phase, was still perceived as present in this current phase (Constraint 14, **Supplementary Table 1**). The remaining three previously seen constraints noted during the FSP1 phase relate to the continued concern over the sharing of data, the variability in bridging the science-policy interface and lack of attention to succession planning (Constraints 18–20, **Supplementary Table 1**).

Among the nine new constraints that were perceived during the FSP2 phase (Constraints 21–29, **Supplementary Table 1**), new institutional, legal and political challenges resulting from the potential exercise of power and influence were highlighted. These were raised as potentially hampering the full integration needed for effective regional ocean governance. Additionally, while recognizing the accomplishment of the current iteration of the SAP as the first of its kind to be supported in the region, the opportunity to enhance its contribution to a regional vision and for increasing buy-in from stakeholders at all levels were noted by contributors (Constraints 25–27, **Supplementary Table 1**). Lastly, limited awareness among governmental decision makers and other stakeholders of the link between regional ocean governance and successfully pursuing the benefits of

a blue economy was raised as a concern (Constraint 24, **Supplementary Table 1**). On a positive note, contributors considered four constraints from earlier phases to have been addressed. These related to the acceptance of a regional vision and SAP (Constraints 6, **Supplementary Table 1**) and improvements in engaging civil society and NICs in the TDA/SAP process as well as better integration across the three transboundary issues (Constraints 15, 16, 17, **Supplementary Table 1**).

As with previous phases, stakeholders involved were principally national agencies and regional intergovernmental organizations (IGOs) with limited but growing inclusion of academia and civil society due to the C-SAP. While for some constraints weaknesses in the policy cycle were noted specifically for the analysis and advice, decision making and implementation stages, all stages of the policy cycle were deemed to be affected. Likewise, vertical and lateral linkages among stakeholders required strengthening during this phase.

## Awareness of Perceived Constraints in Project Documents

In an effort to compare the level of awareness of the 29 perceived constraints identified retrospectively by contributors with efforts undertaken over the life of the CLME initiative, key project-related documents were reviewed (**Table 2**).

### PDF-A Phase: 2001–2005

During 2001–2005, both the PDF-A Project Document (UNDP/GEF, 2001) and the Pipeline Concept Paper (UNDP/GEF, 2003) document submitted to the GEF clearly articulated all 11 constraints identified retrospectively by contributors for this phase of the initiative (Constraints 1–11, **Supplementary Table 1**). These documents stressed the persistent need to address the sustainable use of sLMRs upon which countries in the region depend. They identified the lack of capacity and information at national and regional levels to manage shared resources, coupled with the geopolitical, socio-cultural complexity of the region. They also highlighted the growing negative consequences of human activities for the continued provision of marine ecosystem services. Specific attention is paid in these project documents to the need to address the legal, policy and institutional aspects of governance required to sustainably manage living marine resources and the *ad hoc*, fragmented sectoral approach that was evolving.

### PDF-B Phase: 2006–2007

For the PDF-B phase, four documents (**Table 2**) were reviewed to assess whether the 10 constraints identified retrospectively by contributors in **Supplementary Table 1** (Constraints 5–14) for the PDF-B phase (2006–2007) were anticipated. The project document submitted to the GEF outlined the proposed activities for this phase (UNDP/GEF, 2005). This included information-gathering, producing a preliminary synthesized TDA and SAP, supporting coordinated national and sub-regional inputs from all stakeholders and developing and adopting the FSP1 project document for submission to the GEF. As such, the constraints carried forward from the PDF-A phase were well-recognized at the onset of this phase in this document. Two documents

focusing on the current governance mechanisms in place for both fisheries and non-extractable living marine resources (CLME PCU, 2007b; Parsons, 2007) emphasized weak governance. They highlighted the myriad organizations involved in managing these resources who rarely interacted with each other and the need to strengthen linkages across multiple jurisdictional levels. The fourth report focused on synthesizing the efforts undertaken during the PDF-B phase to produce preliminary TDAs for the three sub-regions (CLME PCU, 2007a). In discussing the findings from the preliminary TDAs, the report highlighted the lack of integration across the three major transboundary issues (fisheries, pollution, biodiversity/habitat degradation). It also identified the need for information to fully understand the implications of poor governance of transboundary issues and to support capacity building to help countries implement regional and global agreements (Constraints 12–14, **Supplementary Table 1**). The adoption of the LME Governance Framework with the goal of having fully functional policy cycles, linked vertically and laterally (Fanning et al., 2007) was also endorsed by countries during this phase, underscoring the need to improve collaboration across sectors, stakeholders and jurisdictional levels. In summary, the constraints perceived by contributors to be present during the PDF-B phase were also noted in relevant project documents for the period.

#### First Full-Sized Project (FSP1) Phase: 2009–2014

The project document submitted to GEF for funding approval of the first full-sized project (2009–2014) reiterated the shared nature of living marine resources within the region and the importance of these resources to the countries in the region (UNDP/GEF, 2008). The document stressed the inadequacy of the existing legal, policy and institutional frameworks, weak capacity among countries to manage the transboundary issues and the poor and fragmented information base. When matched with the 13 perceived constraints identified for this study by contributors for the FSP1 phase (Constraints 6–11 and 14–20, **Supplementary Table 1**), it would appear that most were well-understood and highlighted in the project document at the onset of the FSP1 phase. Three constraints identified retrospectively that were not anticipated in the project document in 2008 related to the increasing poor sharing of data, a potential decrease in bridging the science-policy gap among some decision makers and limited succession planning (Constraints 18–20, **Supplementary Table 1**). Similarly, none of the additional documents reviewed during the time frame of the FSP1 project (**Table 2**; CLME PCU, 2011; Heileman, 2011; Mahon et al., 2012; CLME + PCU, 2013) as well as the mid-term review (Hearns, 2012) noted these three constraints. However, it would appear that the other perceived constraints noted by contributors for this phase were highlighted in these documents. These included: poor governance; inadequate knowledge and low public awareness; weak and ineffective legal and institutional frameworks; inadequate environmental quality standards and legislation; inadequate data and information; and, limited financial and human resources. The final project-related output reviewed for this FSP1 phase, the CLME + SAP, identified a

10 year implementation programme for addressing these issues (CLME + PCU, 2013; Debels et al., 2017).

#### Second Full-Sized Project (FSP2) Phase: 2015–2021

With the endorsement of the SAP by countries in the region, the project document approved for the FSP2 phase (UNDP/GEF, 2015) provided evidence that an accepted regional ocean governance vision for sLMRs had been accomplished. This addressed the constraint identified as present since the PDF-A phase by contributors (Constraint 6, **Supplementary Table 1**) and in project-related documents (**Table 2**). The FSP2 project components focused on implementing the short-term actions of the SAP over a 5 year period aimed at strengthening governance arrangements and increasing human and institutional capacity (UNDP/GEF, 2015; Debels et al., 2017). The activities associated with these components indicate that of the 18 remaining constraints perceived by contributors to be challenging the success of the FSP2 phase, five were not acknowledged in project documents relating to this phase. In addition to the three previously mentioned FSP1 constraints (Constraints 18–20, **Supplementary Table 1**), two newly perceived constraints were noted (Constraints 22 and 29, **Supplementary Table 1**). These related to outdated legislation and the potential unequal exercise of power and influence in crafting mechanisms to address regional ocean governance. Additionally, the mid-term review of the FSP2 phase specifically mentioned constraints associated with the fragmentation of management approaches in the region and insufficient communication, coordination and information exchange (Merla, 2018). However, two major achievements for this period were the establishment of the SAP Interim Coordination Mechanism (CLME + SAP ICM, 2017) and the development of the Civil Society Action Programme (C-SAP). These are aimed at addressing constraints related to regional coordination and civil society engagement as a means of acknowledging the crucial role of civil society in achieving the CLME + vision (CANARI, 2018).

## DISCUSSION

### Type and Number of Constraints

Given that the justification for GEF funding across all phases of the CLME initiative focused on institutional challenges, dependence on living marine resources and limited capacity to address transboundary issues, it is understandable to find 72% of the identified constraints falling into the institutional (41%), capacity building (17%), and awareness building (14%) categories. Equally understandable is the overall focus on these categories during the earlier PDF-A and PDF-B phases where 73 and 70% of the constraints, respectively, comprised these categories as compared to approximately 60% for the latter two phases (**Figure 3**).

The lack of awareness building constraints during the FSP1 phase may be explained by contributors' perception of the momentum gained from implementing the project and the successful endorsement of the project by countries and regional

organizations (UNDP/GEF, 2008). The growing attention given to political and social capital constraints during this phase may also have contributed to a diminished attention to awareness raising. The introduction of the political category during the FSP1 and FSP2 phases is significant and understandable given the requirement for regional consensus to develop and implement strategies to address weak governance and foster an integrative approach to addressing transboundary issues. Similarly, social capital constraints were noted only after the initiative had reached the stage of in-depth strategic planning and implementation. The timing of these two categories in the CLME initiative highlights the need to anticipate and address these types of constraints as they can severely jeopardize the achievement of regional goals and objectives.

## Policy Implications

Of the 29 constraints identified by contributors involved in the CLME Initiative over the period 2001–2021, only 11 were considered to have been addressed, leaving 18 still in need of attention at the conclusion of the FSP2 phase (Table 4). Furthermore, five of the unaddressed constraints were not identified as such in project documents. The policy implications of having constraints unaddressed at this advanced stage of the CLME initiative as well as the consequences of having them present at different phases, even if subsequently addressed, are discussed. However, we note that while contributors were asked to identify perceived constraints based on their involvement during the phases of the CLME initiative, it would be unrealistic to expect all constraints would be addressed solely by these GEF-funded projects.

## Institutional Constraints

Constraints categorized as institutional were identified at the onset of the CLME initiative and extended across the 20 year period of GEF funding (Table 4). As the end of the FSP2 phase approaches, 5 of the 12 institutional constraints remain unaddressed. Policy implications arising from these constraints fall into three major areas: (i) effects of sector-based planning limiting the adoption of an ecosystem-based approach; (ii) dominance of governmental actors in decision-making along with the consequential limited involvement of stakeholders, thereby demonstrating a lack of transparency and inclusiveness as good governance principles; and (iii) gaps and potential duplication from fragmented governance mechanisms potentially resulting in conflicting policies that undermine both sector-derived and integrated management goals.

During the early phases, policy cycles were weak at all levels due to limited data and information needed to contribute to subsequent stages of the cycle. This resulted in discontinuity, particularly between the analysis and advice and decision-making stages. The level of lateral interaction between IGOs with mandates for different transboundary marine issues was minimal. Interaction was primarily vertical between national governments and regional level IGOs. Consequently, while there were regional arrangements with different foci and mandates such as UNEP Regional Seas Programme, with a focus on pollution and habitats/biodiversity, and WECAFC, with a focus

on fisheries, there was no regional mechanism with a mandate to coordinate and integrate them toward a truly EBM approach to ocean governance. This remains the case although there has been considerable progress in this area with the development of a permanent coordinating mechanism to replace the 2017 SAP Interim Coordinating Mechanism (CLME + SAP ICM, 2017; Fanning et al., 2019).

Efforts to establish horizontal linkages among fisheries organizations resulted in an Interim Fisheries Coordination Mechanism through an MOU among WECAFC, OSPESCA, and CRFM in 2016 (CLME + SAP ICM, 2020). This has led to better integration among fisheries policy cycles. At the national level, decision-making was sector-based, despite the growing recognition of the need for a collaborative approach to management at the appropriate scales. From a policy perspective, strengthening horizontal linkages at the national level among the different agencies with responsibility for ocean issues, including the use of NICs and among national level decision makers across the region, could facilitate sharing of information and experiences on interactive governance.

During 2001–2014, mechanisms for participatory governance at the national level were deemed to be weak by contributors to the study because of the persistent culture of top-down management. Additionally, a sense of mistrust/disrespect of civil society by governments was coupled with the public's perception of governments' strong and active resistance to transparency and accountability (Pousadela, 2016; Scobie, 2018). This was despite funding provided since the PDF-B phase to assist countries in establishing NICs, a requirement for all GEF International Waters (IW) projects. NICs are seen as key vertical brokers linking transboundary through national to sub-national governance levels. Their absence or weakness fragments governance (Mahon et al., 2010b). The 2010, 2015, and 2019 surveys on NICs in the region provided considerable insight, indicating many stakeholders were open to either establishing or reactivating marine and/or ocean governance arrangements for achieving effective participatory governance (Mahon et al., 2010b; Compton et al., 2020). Through these surveys, a better understanding of NICs was sought. Emphasis was placed on understanding the gaps/limitations, challenges and successes in order to adequately support national capacities and linkages to regional and international governance processes. As of July 2019, Compton et al. (2020) reported 68% of countries and territories in the CLME + region had NICs in practice or in progress, exceeding the 60% FSP2 project target. Private sector and civil society stakeholders expressed hope that with NICs in place they will have better representation and be given an opportunity to contribute to and influence all stages of the policy cycle, especially the decision-making and data and information stages. Their involvement will likely become increasingly important as countries and the region as a whole seek opportunities from a blue economy.

At the regional level during the FSP2 phase, good informal relationships among many CSOs (and particularly CSO leaders) exist which could be leveraged. However, there is currently no widespread and strong network that could mobilize and

leverage the potential of these organizations. Nature Caribé<sup>12</sup> is one example of a small network formed recently, which has potential but needs further development to position itself in regional governance initiatives. Recent effort within the FSP2 phase to facilitate the development of the Civil Society Action Programme (C-SAP) has resulted in endorsement from some 51 CSOs within the region, with the hope of building and strengthening such a network. Despite national boundaries and cultural boundaries such as language, people and their institutions are well connected across the WCR. They often gather in sites of exchange (e.g., conferences) or are engaged in multi-stakeholder interactions (e.g., in projects) that establish ties. Bonding and bridging capital are evident in moving through the levels of governance (Cooke, 2017). Consequently, most leading organizations and their governance arrangements favor transboundary LMR governance as a rational expression of existing relationships. However, in most Caribbean countries, formal processes can be constraining, supported by outdated laws that restrict interactive governance while fiscal and funding arrangements inhibit effective functioning of CSOs.

### Capacity Building Constraints

Contributors noted that none of the five perceived capacity building constraints have been adequately addressed (Table 4). Countries continue to have limited ability to uptake and incorporate the knowledge gained from participating in regional projects. This often results in new projects that repeat earlier activities, leading to ineffective use of resources. This was exacerbated during the CLME initiative with turn-over in ongoing participation and/or inadequate representation for the tasks at hand, particularly among country representatives. This led to the need to repeatedly overcome the challenge of building awareness and capacity for multi-level governance. One approach for addressing this issue is for all new project participants, irrespective of jurisdictional level or affiliation, to be encouraged to review the online LME governance training module which covers these issues (GEF LME LEARN, 2018), and to adapt this module to the specific region's circumstances.

The incapacity of governments to implement actions committed to in regional and global agreements has resulted in the ongoing degradation of marine ecosystems despite a commitment to ecosystem-based management. In part, this may be attributed to limited financial, human and/or technical resources, a lack of data and appreciation of the economic value of ecosystem goods and services. At the same time, attention to building governmental capacity for SAP implementation with limited support and input from civil society and the private sector in all but the FSP2 phase has the potential to disconnect these important stakeholders from the policy process. While a C-SAP is an acknowledgement of the important role civil society must play in achieving effective ocean governance, contributors highlighted a lack of resources and appropriate messaging and strategies to engage these stakeholders. Seizing opportunities to recognize the usefulness of such programmes as a means to mobilize resources for implementation can be significantly

enhanced, as is currently being anticipated in the draft proposal for the next phase entitled PROCARIBE +<sup>13</sup>. Even where governments and inter-governmental agencies were willing to engage non-governmental stakeholders in governance initiatives in the FSP2 phase, it proved challenging for them to identify focal points who could effectively represent and provide channels for engagement. In some countries, there are networks among CSOs working in a particular area (e.g., environmental CSOs, fisherfolk, small business associations), but very rarely are there linkages across the range of sectors that should be involved in complex issues around ocean governance (e.g., environment, livelihoods, gender, socio-economic development). Lastly, as a major capacity building stakeholder, the role of academic institutions and in particular the University of the West Indies in contributing to training and building capacity that facilitates regional ocean governance needs to be further encouraged and supported. While units such as UWI-CERMES have contributed to all phases of the CLME initiative, a long-term strategy for building the technical and managerial capacity of current and future leaders across all sectors of Caribbean society is needed.

### Awareness Building Constraints

Unlike the persistence of the perceived constraints associated with capacity building over the life of the CLME initiative, efforts to increase awareness levels around regional ocean governance had been relatively successful by the end of the PDF-B phase in 2007. However, given the reidentification of awareness building as a constraint during the FSP2 phase, the need for all key stakeholders, including appointed national focal points, to share in the responsibility of awareness building becomes essential. Even when awareness is present, it does not necessarily translate into action, especially if capacity is limited as discussed in the previous section (Moser and Kleinhückelkotten, 2018). This is particularly concerning for multi-level, polycentric systems such as those found in the WCR where the potential exists for regional level organizations to not fully grasp the benefits and costs associated with properties such as subsidiarity, resilience and redundancy that are inherent in such systems (Mahon and Fanning, 2019a,b). Additionally, much has been made of the potential of the CLME initiative to contribute to both the achievement of the 2030 Sustainable Development Goals and the pursuit of a blue economy. However, building expectations without also developing understanding of how to achieve them could have significant policy and socio-political implications if those expectations are not realized. As such, contributors to this study noted the importance of measures to increase awareness and understanding of the challenges and opportunities associated with achieving these benefits (Clegg et al., 2020). This likely assumes added importance given efforts aimed at a post-Covid socio-economic recovery, especially among SIDs.

### Leadership Constraints

A lack of regional level leadership for integrated ocean governance has delayed agreement on an accepted regional

<sup>12</sup><http://naturecaribe.org>.

<sup>13</sup>See [https://clmeplus.org/ppi\\_database/protecting-and-restoring-the-oceans-natural-capital-to-support-post-covid-recovery-and-to-drive-region-wide-investments-toward-a-sustainable-blue-economy/](https://clmeplus.org/ppi_database/protecting-and-restoring-the-oceans-natural-capital-to-support-post-covid-recovery-and-to-drive-region-wide-investments-toward-a-sustainable-blue-economy/).

vision for the CLME + region until the FSP2 phase. This has resulted in a sustained focus on national development issues and priorities, disconnected from an integrated regional perspective. At the end of the FSP1 phase, this constraint was addressed with countries agreeing on priority strategies and actions needed to improve regional governance (CLME + PCU, 2013). However, what is still lacking are coherent decisions and joint “whole of society” national/regional consensus on regional targets to address the transboundary issues of overfishing, pollution and habitat degradation/biodiversity. Better clarity around how the components of the SAP fit into the broader development vision for the region and into the strategies of existing regional IGOs themselves could help facilitate this. It could also help countries recognize the ongoing and likely benefits to be gained from regional level engagement in integrated ocean governance. Without such buy-in, there is a real possibility that national leaders may question the ongoing utility of achieving regional level consensus and decision making. There is also concern as to where the leadership for regional approaches to ocean governance within the region will come from, given limited attention to succession planning and unless funds are forthcoming for a third FSP. Effort to solicit such funding from GEF is currently in progress as are other efforts such as the development a Caribbean Network of Fisherfolk Organization Leadership Institute under the FAO StewardFish project (FAO and WECAFC, 2020).

### Legal Constraints

A significant issue that influences policy setting occurs when subregional, regional, and global arrangements are unable to require mandatory implementation by countries (Kumar, 2020). While this authority has been successfully demonstrated in the Central American sub-regional policy mechanism (SICA and associated bodies), the approach that has evolved for the region as a whole is a networked governance framework which allows for a diversity of binding and non-binding decision-making mechanisms (Mahon et al., 2014). Research on LMEs globally has shown that countries are more willing to adopt non-binding agreements (Fanning et al., 2015). However, in the absence of adequate resources and the geopolitical complexity of the region, adoption and implementation of regional level rules by countries remain uncertain. Yet another legal issue arises from the growing demand by stakeholders to be involved in decisions affecting their well-being through an interactive and collaborative governance approach. This will require both legal and institutional reforms to fully enable progress beyond the FSP2 phase. At the regional intergovernmental level, there has been some success around decisions of the Cartagena Convention as a legally binding instrument as well as Ministerial Decisions of CARICOM, OECS, CRFM that have formed the basis for legal and regulatory reforms. However, recent discussions around strengthening the decision-making capacity of WECAFC suggests that legal-institutional issues or perceptions remain large constraints.

### Political Constraints

Both of the political constraints identified by contributors arose during the FSP1 and FSP2 phases and both were thought

to be unaddressed. In terms of the argument supporting the use of evidence to inform decision making, Anderson (2002) highlighted its contribution in developing more informed policy interventions following a better understanding of problems. As a result, not only do decision makers have a better sense of the likely effectiveness of policy options but this helps to improve the quality of stakeholder input when selecting policy objectives. For the WCR, these may include not only consensus around environmental targets but on the types of investments/activities that eventually have the greatest impact on coastal and marine resources. However, policy in the WCR has seldom been science driven, especially in the SIDS with low to moderate capacity to either produce or fully utilize science (natural, social or interdisciplinary) (McConney et al., 2016). In the earlier PDF-B phase, contributors noted interest among decision-makers in having science inform regional and national decision making. This may have been due to increasing awareness of the LME modular concept as a result of the GEF process (Sherman, 1999) even though the focus was on governance. In the later phases, notwithstanding the development of a research strategy with input from regional research institutions and academia (Acosta et al., 2020), some contributors perceive less emphasis on bridging the science-policy interface. However, others have noted the increase in interest of science-policy bridging tools as one of the anticipated outcomes of the FSP2 phase. The need to bring widely dispersed expertise, data and information in the region together in ways that would focus these assets on priority policy and management issues has been documented (Merla, 2013; Cortés et al., 2019). Addressing this need in the WCR has been initiated with the development of status reports for the protocols relating to land-based sources of pollution and habitats under the Cartagena Convention. The intent is to provide the science and data to decision/policy makers, with the aim of having a policy impact. Additional challenges that need to be overcome include the increasing number of overlapping marine science projects and/or poor or deteriorating communication and uptake of national and institutional data and information in the relevant policy cycles.

The second identified political constraint arises from the diversity in human, technical and financial capacity within the CLME + region and the resulting potential for such power disparities to manifest themselves in regional ocean governance processes. This diversity creates an environment where political advantage may be sought by the exercise of power and influence among those who have it, both internal and external to the region (Erisman, 2019). Mahon et al. (2014) were of the view that the effort to craft agreement surrounding the establishment of a permanent coordinating mechanism (CM) during the FSP1 phase was challenged by such a demonstration of power and influence. The complex process of leading such a geopolitically diverse region toward consensus on mandate, structure and modalities, and the roadmap toward formally establishing the CM, did not fully manifest itself during the FSP2 phase. It will now take a third phase to fully establish, operationalize and consolidate the coordination mechanism. Some of the issues faced were countries' concerns over the legal personality of the mechanism, its mandate and dispute resolution mechanisms,

among others. Resolving these issues in a collaborative manner is especially important for gaining consensus on and buy-in for the CM as it is intended to play a key role in strengthening multi-jurisdictional vertical linkages and lateral linkages among the components of the region's ocean governance framework.

### Social Capital and Socio-Cultural Constraints

Although contributors identified only one constraint in the social capital and socio-cultural categories, potential policy implications associated with these can be significant. Regarding socio-cultural diversity, this has implications on the type of policy direction arising from differing value systems and priorities and the potential for misinterpretation across different languages. Potentially exacerbating this is the degree of attention paid to transboundary issues in the WCR by metropolitan countries with territories in the region. Early experience found engaging these countries in regional issues involving their overseas territories was difficult. However, this has improved during the FSP2 phase with engagement by Dutch territories and with France signing the SAP. While there are challenges arising from the diversity of socio-cultural factors in the CLME + region, explicitly including measures to enhance the awareness and understanding of these differences (and similarities) in regional project activities could help facilitate cross-cultural opportunities and other beneficial project-related consequences not previously anticipated.

In terms of recognizing the importance of building social capital to successfully achieve an integrated, ecosystem-based approach to managing sLMRs, succession planning across all stakeholders and sectors was perceived to be essential. Given the long-term horizon of the goals and objectives of the current and future SAPs, policies aimed at ensuring the human resources and transfer of commitment to upcoming generation of leaders are critical. Many policy actors in the WCR who were instrumental in building and advancing theory and practice for regional ocean governance have moved on or are in the mid to late stages of their careers. There is the potential for losing institutional memory, which can have detrimental consequences for achieving success. A related concern noted in both the mid-term evaluation and the terminal evaluation reports for the FSP1 phase was the resulting delay in project deliverables due to high project staff turn-over (Hearns, 2012; Merla, 2013).

### Cross-Cutting Policy Implications

While each of the categories of constraints discussed above has specific policy implications, the diversity in the range of categories themselves and the interconnectedness among categories of constraints introduce yet another set of policy implications. For a developing region that has been assessed as one of the most geo-politically and socio-culturally complex among ocean regions (Mahon et al., 2017), the multi-faceted complexity of the constraints makes it significantly more difficult to develop policies aimed at achieving a common vision and prioritizing actions. Despite this, by the end of the FSP2 phase, the SAP has been widely supported by the countries.

Lastly, by exposing the number of constraints that were carried forward from one phase to the next, this study raises

the policy-relevant question surrounding the possible inflexibility of large initiatives such as those funded by the GEF to address constraints that might arise and to link to new and emerging issues being promoted. Our research does not have an answer to this question. However, we believe it deserves to be mentioned as the success of these multi-million-dollar investments and expectations of those who depend on the ongoing provision of marine ecosystem goods and services necessitate overcoming these constraints and seizing opportunities that might arise.

### Moving Forward

The focus of this study has been on the constraints that contributors involved in the CLME initiative perceived to have been present during the four phases spanning 2001–2021. The analysis indicated 18 of the 29 identified constraints still need to be addressed. However, rather than being seen as a deficiency of the CLME initiative, this result highlights a number of lessons from which both the WCR and other complex developing regions can benefit. First, while identifying and overcoming potential barriers is a key step toward project success, it is worth remembering that no single initiative can be expected to address all constraints. To quote one contributor.

*It was acknowledged that addressing all root causes and constraints would need to be achieved through a multitude of projects, under the umbrella of a "SAP" programmatic approach. I do think it is important to note that some constraints were not explicitly acknowledged in the FSP2 CLME + project, but it should also be made clear that CLME + , while having a central role in SAP implementation, could never have been expected to resolve all challenges, root causes and constraints that were to be addressed for full, successful SAP implementation/achievement of the CLME + Vision.*

A second lesson is acknowledging the difficulty, financial resources and time needed to develop the institutional mechanisms and to build the capacity to implement regional ocean governance. This is exacerbated in regions with the inherent limitations of SIDs and the asymmetrical distribution of expert and human resources capacity, as found in the WCR. However, progress is evidenced in the WCR where the level of endorsement from countries grew from five for the PDF-A proposal in 2001 to 15 for the PDF-B proposal in 2005 to 23 for the FSP1 proposal in 2008 to 25 countries and counting for the CLME + SAP since 2019.

Thirdly, achieving consensus on regional targets and addressing the limited implementation of commitments by countries are linked to political, legal, financial, and leadership challenges. Future initiatives therefore need to give more attention to improving the implementation deficit. Examples include focusing on achieving results through legal and institutional reforms and capacity building as well as better decision-making and leadership, supplemented with robust monitoring and evaluation systems. While project-related activities such as those undertaken with GEF-funded support can serve to highlight and catalyze these changes, national budgetary conditions also play a key role as these improvements are unlikely to be made solely with project funding.

A fourth lesson centers around the benefits of developing processes for engaging civil society early while also recognizing the requirement to build governmental buy-in and support. Much of the attention in the CLME initiative focused on the latter. The lack of engagement of civil society in the earlier phases of the initiative has been acknowledged in the current FSP2 phase. As discussed above, this is now being accommodated by facilitating the endorsement of a civil-society version of the SAP, referred to as the “People Managing Oceans” C-SAP. This programme is intended to deliver on civil society’s contributions to achieving the over-arching, regional vision shared among civil society and governments. Despite its late timing, it has already contributed to strengthening the awareness of CSOs across the region and the value of their contribution to regional ocean governance in the WCR. The experience in the WCR has highlighted the significant challenge of successfully linking key stakeholder groups from civil society and the private sector with those involved in developing and implementing policy, in part due to their diverse and diffuse interests. However, an explicit and early recognition of efforts needed to build in engagement mechanisms that allow for the expression of these interests coupled with capacity building can help with mitigating this governance gap.

A final lesson relates to the importance of sharing and making information pertaining to regional ocean governance more easily accessible. To highlight this point, three separate SAPs for different ocean-related projects have been implemented within the timeframe of the FSP2 phase of the CLME + initiative and one more is known to be in development. While there is overlap in regional IGOs and other stakeholders involved in these projects, these projects have not been as well-coordinated as they could be to maximize opportunities, emphasizing the importance of a knowledge-based regional coordinating mechanism (CM). To facilitate this, an internet-based “knowledge management” Hub is being developed in the FSP2 phase to enhance region-wide insights into actions on the marine environment. Maintenance of the Hub is currently through the Secretariat of the ICM and will be co-owned by the CM membership, once established. In addition to being a knowledge repository, the Hub will include a “training portal” prototype developed under the lead of IOCARIBE, aiming at creating awareness among stakeholders about training and capacity building initiatives. While the Hub aims to reduce duplication of efforts by providing better insights into all ongoing activities, its success and impact will be determined by level of engagement of, and contributions by, all stakeholders in the region.

## CONCLUSION

Over the past two decades, the efforts to implement an integrated, regional approach to sustainably manage sLMRs

of the CLME + region have been extensive. With financial, technical, and human support provided by an array of committed actors from multiple sectors and jurisdictional levels spanning local to global, the progress achieved to date has not been without its challenges. Of the 29 constraints identified in this paper by contributors, overcoming institutional and capacity constraints have been particularly challenging for the region. Similarly, given the geopolitical complexity and diversity of the region, committed policy actors and stakeholders have had to acknowledge and reconcile a number of political, leadership, legal, socio-cultural and social capital issues in a manner that reflects the specific context of the WCR. The ability to meaningfully engage governmental, civil society and private sector actors across sectors and geographic space to accomplish a shared vision for the ocean is no doubt an achievement that many regional initiatives are seeking. By sharing the experiences of the CLME + region, this paper contributes to an improved understanding of the barriers to be overcome in highly complex socio-political developing regions. This is especially needed if regional initiatives, particularly those that involve GEF-eligible countries, are to play the essential role identified in the 2030 Agenda and contribute to realizing the sustainable benefits of a blue economy.

## DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/**Supplementary Material**, further inquiries can be directed to the corresponding author/s.

## AUTHOR CONTRIBUTIONS

LF wrote all versions of the manuscript. LF and RM undertook the data analysis. All authors contributed to the structure, design of the research methodology, manuscript revision, read, and approved the submitted version.

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## SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fmars.2021.667273/full#supplementary-material>

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# Navigating the Complexity of Regional Ocean Governance Through the Large Marine Ecosystems Approach

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Governance is a multifaceted and complex process, involving a wide range of stakeholders from numerous institutions and individuals with different interests, agendas and sets of skills. A number of barriers exist for states to work together on securing their shared coastal and marine ecosystems, with discussions often becoming clouded when disputes arise over Exclusive Economic Zones, borders, oil and gas resources, continental shelves, maritime transport, and fisheries. Over the last twenty-six years, the Global Environment Facility's (GEF) International Waters focal area has utilized the Large Marine Ecosystem (LME) approach to navigate the complex problems related to transboundary issues affecting the world's marine ecosystems, of which forty-one out of sixty-six are shared (62%) by one or more countries. To overcome the disputes and assumptions about the intentions of neighboring states, the GEF developed the Transboundary Diagnostic Analysis-Strategic Action Programme (TDA-SAP) assessment and strategic planning processes to help countries learn how to work together and build trust. This formal and inclusive process analyses all pertinent factual and scientific information to set priorities for action. This practical method for integrating science into management has provided an effective approach to inform and advance sustainable LME management and governance regimes; however, there is not a one size fits all approach. This review presents six examples from the GEF International Waters portfolio that demonstrate how the LME Approach and TDA-SAP process have helped countries find the best way to mainstream ecosystem-based management approaches into existing contexts and politics. While these examples span a wide range of different settings (geographic, political, socio-economic, temporal), they have all applied the LME Approach and TDA-SAP process to tackle complex regional ocean governance issues. Each example provides a historical perspective, the key results achieved, and their unique lessons learned/best practices. Furthermore, the review identifies some of the overall shortcomings of the process and the common lessons learned,

underscoring the complex and daunting challenge of achieving effective governance for multi-country LMEs. The experience provided by these examples shows that practical ecosystem-based management of the ocean and its coasts not only requires flexibility and adaptability, but also time, associated long-term vision and commitment.

**Keywords:** Large Marine Ecosystems Approach, Transboundary Diagnostic Analysis, Strategic Action Programme, International Waters, governance

## INTRODUCTION

The Large Marine Ecosystem (LME) Approach for the assessment and management of coastal and ocean ecosystem services has gained momentum since the mid-1980s (Sherman, 2005). It combines the legal principles of the United Nations Convention on the Law of the Sea (UNCLOS) with a multi-sectoral and multidisciplinary strategy for assessing and managing the changing state of the world's sixty-six LMEs (Sherman, 2019). These highly productive areas of the ocean share six main priority threats (United Nations Development Programme, 2017) including:

- Water quality degradation from multiple pollution sources;
- Decline in living marine resources from over-exploitation;
- Collapse in ecosystem integrity and loss of biodiversity;
- Habitat degradation and loss;
- Invasive species; and
- Climate change.

To support ecosystem-based management actions necessary for the sustainable use and development of LMEs, five modules and their associated indicator metrics serve as the primary source of data and information to inform strategic planning and implementation. These include natural science indicators for measuring LME (i) productivity, (ii) fish and fisheries, (iii) pollution and ecosystem health, as well as two social science metrics related to (iv) socioeconomics, and (v) governance (Sherman, 2005).

Governance in LMEs occurs at a variety of scales, and to achieve good ocean governance, coordination is required at all levels of implementation (Fanning et al., 2007; GEF LME:LEARN, 2018). At the local scale, LME governance acknowledges the need for community-based management and the importance of indigenous and local communities in co-creating sustainable environmental policy. At the national level, LME governance requires coordination between different ministries of the government and other stakeholder groups. On a regional scale, management becomes more complex and the focus is on cooperation among LME countries to manage pressing transboundary issues (GEF LME:LEARN, 2018).

Typically, an LME extends beyond the boundaries of two or more countries, and often these states find themselves locked in long-lasting and complex conflicts over marine resources. Continued depletion and degradation of the ocean and its coastal areas are most often attributed to failures in governance. As outlined by Duda (2016), difficulties in formulating, adopting, and implementing an appropriate governance system are not only a result of political considerations,

but the variability and complexity of natural systems also play a role in the creation of fragmented governance frameworks. Thus, the articulation of practical ecosystem-based approaches to ocean and coastal management are rare, particularly in a transboundary context. Since 1995, the Global Environment Facility (GEF) has provided financial support to the sustainable governance of twenty-three LMEs and has utilized a highly collaborative process as a major strategic planning tool for GEF International Waters Projects (Global Environment Facility [GEF], 2020).

The Transboundary Diagnostic Analysis (TDA)-Strategic Action Program (SAP) process (TDA-SAP process) enables countries to reach consensus on the priority transboundary issues and the actions required to address these via a joint LME project. The process facilitates a science-based strategy to monitor changing LME conditions by applying the five LME Approach modules. The TDA has a technical role in identifying, quantifying, and setting priorities for environmental problems that are transboundary in nature. Ultimately, it provides the scientific basis for the formulation of a SAP, a negotiated policy document endorsed at the highest level of all relevant sectors of government. The SAP then establishes clear priorities for action – such as policy, regulatory and institutional reforms and investments – to resolve the agreed upon transboundary issues identified in the TDA. A key element of a SAP is a well-defined baseline that enables a distinction between actions with national benefits and those where addressing transboundary concerns have global benefits (GEF IW:LEARN, 2020).

Together, the LME Approach and TDA-SAP process have helped foster a diversity of regional ocean governance mechanisms including formal conventions and commissions, protocols under existing Regional Seas Programs, improved coordination mechanisms, and other enhanced arrangements to mainstream ecosystem-based approaches. A considerable number of GEF International Waters projects have utilized these processes, and their success is a result of adapting this best practice methodology to the context and politics of the region. Just as each LME is unique, the resulting TDA and SAP are also unique. In this review, the diverse examples provided from the GEF International Waters portfolio emphasize this message by demonstrating how they have moved fragmented regional ocean governance toward an integrated, multi-stakeholder, ecosystem-based approach that nurtures, builds on, complements, and strengthens existing frameworks. These experiences also provide lessons that offer some insights on the shortfalls of and opportunities through these processes in achieving governance for LMEs.

## REGIONAL COOPERATION TO SAVE THE BLACK SEA

Almost cut off from the rest of the ocean, the Black Sea is one of the most isolated and exceptional regional seas globally (United Nations Development Programme, 2011). Its only connection is through the Bosphorus strait, a 35 km natural channel carrying 300 km<sup>3</sup> of seawater to the Black Sea from the Mediterranean along the bottom layer, and returning a mixture of seawater and freshwater twice the volume in the upper layer (United Nations Development Programme, 2007a). Approximately 350 km<sup>3</sup> of river water enters the Black Sea annually, including flows from the Danube, Dniro, Don, and Dniester river basins (United Nations Development Programme, 1997).

Little to no action had been taken to protect the Black Sea prior to the 1990s due to the lack of knowledge of the environmental situation and political differences during the Soviet era (United Nations Development Programme, 2007a). The Black Sea experienced unprecedented degradation when widespread nutrient loading caused a large dead zone (Van Lavieren and Hanneke, 2015). Eutrophication led to radical changes in the ecosystem with major impacts on biological diversity and use of the sea, including recreation and fisheries (Van Lavieren and Hanneke, 2015). All countries comprising the Black Sea basin contributed to its near demise, emphasizing a strong need to harmonize legal and policy objectives and develop common strategies (United Nations Development Programme, 2007a).

A first decisive step toward a cooperative framework was taken in 1992 when representatives from Bulgaria, Georgia, Romania, Russia, Turkey, and Ukraine drafted the “Convention on the Protection of the Black Sea against Pollution”, which was signed in Bucharest (Convention on the Protection of the Black Sea Against Pollution, 1992; United Nations Development Programme, 1997). Entering into force in 1994, it includes a basic agreement and several protocols aimed at controlling land-based sources of pollution, dumping of waste, joint actions in response to accidents, and biodiversity and landscape conservation (Black Sea Commission, 2009). To set the goals, priorities, and timeline needed to bring about action, a Ministerial Declaration on the Protection of the Black Sea Environment was signed in 1993 by all six Ministers of the Environment in Odessa (Odessa Ministerial Declaration on the Protection of the Black Sea, 1993), under the stewardship of the United Nations Environment Program (UNEP). From the outset, the Declaration was seen as an interim policy arrangement, with its signatories calling upon the GEF partners to assist with developing a medium to long-term action plan for the protection of the Black Sea (United Nations Development Programme, 1997).

Building upon this momentum, a proposal was presented to the GEF to financially support the three-year Black Sea Environmental Program (BSEP) launched with the support of the United Nations Development Program (UNDP) (United Nations Development Programme, 2004a). The overall objectives of BSEP were to improve the capacity of the Black Sea countries to assess and manage the environment, to support the development and implementation of new environmental policies and laws, and facilitate the preparation of sound environmental investments

(United Nations Development Programme, 1997). With the support of the Government of Turkey, the BSEP established itself in Istanbul. To spread the technical responsibilities of the program throughout the region, a system of Regional Activity Centers and Advisory Groups was created involving institutions from all six Black Sea countries (United Nations Development Programme, 1997). This enabled the program to bring together specialists who had not been able to cooperate previously, creating an environment for fresh and productive dialog (United Nations Development Programme, 2004a). Furthermore, the BSEP itself became a “label”, serving an important function of making the various interventions coherent and attracting donor interest to the popular “Saving the Black Sea” cause (Black Sea Commission, 2009). The GEF project staff became *de facto*, the Secretariat for BSEP, which was an informal arrangement. This approach allowed staff from projects such as the EU’s Tacis Black Sea to be seconded to the GEF project, and for the Director-General for the Environment of the European Commission to grant initial funding to the unit from 1999–2000 (United Nations Development Programme, 2004a).

The Program was also responsible for the development of the first Black Sea Transboundary Diagnostic Analysis (TDA) prepared by a group of sixteen leading specialists, drawn from fourteen countries (including all six Black Sea countries) together with five BSEP Program Coordinating Unit specialist staff (United Nations Development Programme, 2007a). Together they analyzed the thematic reports based upon the work of over a hundred Black Sea specialists cooperating through the BSEP network (Kinley, 2002). These represented some seventy-five national assessment reports and thirteen regional synthesis reports completed within the Program framework (Kinley, 2002), examining the root causes of Black Sea degradation and then proposing solutions (policy changes or capital investments).

Based on this TDA, high-level representatives of Black Sea governments were able to negotiate a very practical Black Sea Strategic Action Plan (BS-SAP), with the first draft completed by governmental representatives in June 1996 and submitted to intensive review at the national level (United Nations Development Programme, 1997). Following two further meetings, the refined draft was ready for submission to the Ministerial Conference in Istanbul on 31 October 1996 (Black Sea Commission, 2009). The BS-SAP was a groundbreaking document for the Black Sea region, establishing specific targets and timetables for implementing the objectives of the Bucharest Convention (Black Sea Ecosystem Recovery Project [BSERP], 2005). It contained fifty-nine specific commitments on policy regarding measures to reduce pollution, improve living resource management, encourage human development without prejudice to the environment, and to take steps toward improving the financing of environmental projects (United Nations Development Programme, 1996). With many of the Black Sea countries having numerous new legislation awaiting parliamentary approval, the BS-SAP took a pragmatic approach by recognizing the need to harmonize the objectives of these laws and regulations (United Nations Development Programme, 1997). Following the signing of the BS-SAP by the six Black Sea Environment Ministers, and to enable countries to complete

National Black Sea Strategic Action Plans and for negotiations on the institutionalization of the Istanbul Commission's Secretariat to be completed, GEF funding was sustained, and additional support from the European Commission was committed to enable the implementation of the BS-SAP<sup>1</sup> (United Nations Development Programme, 1997; Black Sea Commission, 2009).

After a protracted three-year process where the Black Sea countries worked on the technical and legal aspects of establishing a Secretariat, a breakthrough in the negotiations occurred, and the Black Sea Commission finally became operational in October 2000 (Black Sea Ecosystem Recovery Project [BSERP], 2005). Bulgaria, Romania, Turkey, and Ukraine made financial contributions to the Commission, and the Republic of Turkey provided the facilities for the Secretariat (Black Sea Commission, 2009).

In 2001, a Strategic Partnership was established through the GEF that brought together the Danube River Basin and the Black Sea (Black Sea Ecosystem Recovery Project [BSERP], 2005). These two water bodies and their key government, intergovernmental, donor, and civil society stakeholders formed an alliance to adopt a "basin-wide approach" to put in place sustainable systems of Danube and Black Sea management and governance. One component, the "Black Sea Ecosystem Recovery Project" (BSERP), was funded by the GEF and implemented by UNDP in partnership with UNEP and the United Nations Office for Project Services (UNOPS) (United Nations Development Programme, 2004a). A sister project for the Danube River Basin, "Strengthening Implementation Capacities for Nutrient Reduction and Transboundary Cooperation in the Danube River Basin," complemented and was closely coordinated with the BSERP (Van Lavieren and Hanneke, 2015). A third component of the Strategic Partnership under the World Bank involved a suite of ten nutrient reduction investments across the Danube/Black Sea countries (United Nations Development Programme, 2004a). Commencing in 2002, the BSERP aimed to support the regional aspects of the Black Sea Partnership for Nutrient Control and strengthen the role of the Black Sea Commission (United Nations Development Programme, 2004a). Under BSERP, the Black Sea Transboundary Diagnostic Analysis was revised and accepted in 2007 with the input of twenty-two experts from the Black Sea countries who collated verified scientific information (United Nations Development Programme, 2007a). The revised document was the factual basis for the formulation of the 2009 Black Sea Strategic Action Plan formally adopted in Sofia, Bulgaria (Black Sea Commission, 2009). The document embodied specific action (policy, legal, institutional reforms, or investments) that could be adopted nationally, within a harmonized multinational context, to address the major priority transboundary problems, and over the longer-term, restore or protect the Black Sea ecosystem (Black Sea Commission, 2009). By supporting countries to create an enabling environment for governance reform and investment, significant reductions in nutrient pollution occurred in the Black Sea (United Nations Development Programme, 2012b). Between 1988–1996, nitrogen

loads to the Black Sea averaged at 36 000 (mt/yr), and by 2005 this figure had significantly decreased to 25 104 (mt/yr). Inorganic phosphorus loads into the Black Sea were between 10–20 (kt/yr) after the mid-nineties (Black Sea Commission, 2008), and dropped 5–6 (kt/year) up until 2002 (United Nations Development Programme, 2012b). Almost USD3 billion had been invested to address over two hundred nutrient pollution hot spots in the Black Sea and Danube River, the collective effort culminating in the recovery of the North West Shelf of the Black Sea from hypoxic conditions (United Nations Development Programme, 2012b). The highlighted results and unique lessons learned during the UNDP/GEF intervention from 1995–2009 are summarized in **Table 1**.

## BENGUELA CURRENT COMMISSION: FROM PROJECT TO CONVENTION

Flowing north-northwest from the Cape of Good Hope in South Africa and along the coast of Namibia before tapering off into Angola, the Benguela Current is one of the world's more powerful wind-driven coastal upwelling systems and one of the world's most productive marine ecosystems (Hamukuaya et al., 2016). Contributing almost US\$269 billion per annum in ecosystem goods and services, the long-term sustainability of the Benguela Current Large Marine Ecosystem is critical to the economic development and security of these three African countries (Van Lavieren and Hanneke, 2015).

During the 1960s and 1970s, an explosion of foreign fishing fleets began pillaging the waters of Angola, Namibia and South Africa, resulting in the severe depletion and collapse of several fish stocks such as hake, sardine and anchovy (United Nations Development Programme, 2001). This also coincided with the liberation struggles in all three countries and the associated civil wars, driving population migration to the coast. Consequences included localized pressure on marine and coastal resources, as well as an increase in localized bay pollution (United Nations Development Programme, 1999).

The three countries recognized a need to develop a viable joint and integrative mechanism for the sustainable environmental management of the region as a whole and move beyond their historical conflicts (United Nations Development Programme, 2000a). In 1995, during a workshop on Fisheries Resource Dynamics in the Benguela Current Ecosystem held in Swakopmund, Namibia, the foundations were laid for two extraordinary programs. The first was the Benguela Environment Fisheries Interaction & Training Program (BENEFIT), which focused on capacity development and science and technology as applied to fisheries and the fish environment. During the workshop, participants were also inspired by the progress shared on the sustainable development of the Black Sea. This led to the countries requesting support from the GEF via UNDP to develop and implement the Benguela Current Large Marine Ecosystem (BCLME) Program (United Nations Development Programme, 2005). Complementary to BENEFIT, this program was a broad-based multi-sectoral initiative, aimed at sustainable integrated management of the Benguela Current ecosystem as a whole

<sup>1</sup>The BS-SAP was amended on 14 June 2002, in Sofia (the Sofia Ministerial Declaration).

**TABLE 1 |** Highlighted results of the TDA-SAP process and LME Approach in the Black Sea as well as unique lessons learned from the intervention (United Nations Development Programme, 2007b; Fox and Buijs, 2008).

| Timeframe of the UNDP/GEF intervention | Key governance related results achieved/features in the SAP   | Unique lessons learned and best practices  |
|--|---|--|
| 1995–2009                              | <ul style="list-style-type: none"> <li>• Reviews of the legal, administrative and investment practices relating to eutrophication control to identify cost-effective alternatives were undertaken. The legal protocols governing pollution and resource use in the Black Sea were revised with new policies and laws for each coastal state;</li> <li>• Support to the established Black Sea Commission was provided, including promotion of revised protocols and the development of new ones such as the new Fisheries Convention;</li> <li>• Agricultural policies were reformed, industrial and municipal wastewater treatment improved, key basin ecosystems were rehabilitated, and the region's legislative framework and enforcement were strengthened;</li> <li>• The establishment of a joint technical working group of the Black Sea and Danube Commissions enabled the development of a joint strategy on eutrophication and allowed the countries to pursue common targets</li> <li>• The Black Sea SAP helped identify and map marine habitats and assess transboundary fish populations. It established conservation areas and secured the protection of marine mammals such as the highly endangered monk seal;</li> <li>• Governments were assisted with water quality monitoring and collaborated with the private sector to draw up a contingency plan for oil spills.</li> </ul> | <ul style="list-style-type: none"> <li>• A well-managed and adequately funded Commission needs to be in place to take on the role of revising TDAs and SAPs, with donor funded projects playing a supporting role. Placing this responsibility outside of the established Commission runs the risk of lowering country ownership and responsibility;</li> <li>• The revised TDA was a significant improvement over its predecessor, however it was perceived as a consultant driven exercise. Future TDA revisions were recommended to become part of the ongoing effort of the Commission and any subsidiary bodies;</li> <li>• The Black Sea region had witnessed a significant reduction in support for marine sciences and regional research institutes. As such, projects like the BSERP became a critical lifeline for research on marine and riverine issues, emphasizing the importance of capacity building and training;</li> <li>• During the first phase of the project, full time Country Team Leaders were hired in each of the six countries to help coordinate activities at the insistence of the participating countries. This strategic decision helped the involved Ministries and staff to follow through on expected commitments, especially in countries where there is little capacity to take on more obligations and budgets are not increased to cover in-kind contribution obligations;</li> <li>• Exit Strategies are recommended to help countries focus on the eventual closure of a donor supported project and what they will do to sustain and replicate activities. The Exit Strategy developed by the BSERP and Black Sea Commission built on the institutional review of the Commission and provided considerations on how it could carry out its intended mission over short, medium and long term. Another key consideration is including recommendations for a phased transfer of financial responsibility from the donor funded project to the established Commission;</li> <li>• Institutional strengthening through donor funded projects need to ensure a high level of clarity regarding the relationship between the project and the established Permanent Secretariat. This relationship can become complicated, especially related to aspects such as the span of control and decision making authority on how budgets are allocated;</li> <li>• Inter-ministerial coordination is important and should be part of the Project Document expectations, with commitments from all relevant ministries obtained prior to project approval.</li> </ul> |

(United Nations Development Programme, 1999). In 1998, a GEF grant was awarded to enable the development of a comprehensive project proposal and necessary Program instruments such as Thematic Reports, a Transboundary Diagnostic Analysis, and a Strategic Action Program (United Nations Development Programme, 1999, 2000a).

By 1999, the countries began preparatory work on the TDA that served to provide structured information relating to the social, economic and ecological status of the BCLME, with particular focus on transboundary impacts from anthropogenic actions (Hamukuaya et al., 2016). During a regional workshop in Windhoek, Namibia regional experts and international LME experts came together to draft the TDA and develop the framework of the SAP which outlined the regional policy for the integrated sustainable management of the BCLME. In January 2000, seven ministers from Angola, Namibia, and South Africa signed the SAP (United Nations Development Programme, 2001).

With the necessary Program instruments in place, the countries launched the five-year BCLME Program in 2003 (United Nations Development Programme, 2005). The Program provided a means for them to identify and resolve priority transboundary environmental problems at the LME level

through long-term collaboration and partnership (Hamukuaya et al., 2016). The confidence and trust that grew between the three governments under the Program led to significant progress in the management of their shared marine resources. A central element of the SAP, and a key output of the Program, was the creation of the Benguela Current Commission (BCC). An Interim Agreement establishing the Commission was signed by South Africa and Namibia in August 2006 and by Angola in January 2007 (Van Lavieren and Hanneke, 2015). The permanent establishment of the BCC in 2008 constituted the first fully institutionalized and operational intergovernmental, multi-sectoral LME commission in the world (Benguela Current Commission, 2014). It was also the first ever inter-governmental commission based on the LME concept for ocean governance. This signified an important paradigm shift toward managing shared marine resources at a larger ecosystem level while balancing conservation obligations with human needs (Van Lavieren and Hanneke, 2015).

From 2011–2012 the countries worked together to finalize the content of the Benguela Current Convention that was signed March 2013, in the city of Benguela, Angola (Benguela Current Convention, 2013; Hamukuaya et al., 2016). This Convention effectively replaced the Interim Agreement, formally establishing

the BCC as a permanent intergovernmental organization. By July 2014, the Convention had been ratified by all three countries (Benguela Current Commission, 2014), bringing it into force, and continuing to grow from strength to strength. The highlighted results and unique lessons learned during the UNDP/GEF intervention from 1998–2014 are summarized in Table 2.

## ESTABLISHING A PROTOCOL TO THE ABIDJAN CONVENTION IN SUPPORT OF THE GUINEA CURRENT LME

Extending from the Bijagos Archipelago of Guinea-Bissau in the north to Cape Lopez on the coast of Gabon in the south, the Guinea Current Large Marine Ecosystem (GCLME) includes the exclusive economic zones of sixteen countries, namely, Angola, Benin, Cameroon, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Gabon, Ghana, Guinea, Guinea Bissau, Liberia, Nigeria, Sao Tome and Principe, Sierra Leone and Togo (United Nations Development Programme, 2013a; United Nations Environment Programme, 2017). The region faces a number of challenges such as coastal erosion, habitat degradation, loss of biodiversity, overfishing, population growth and urbanization, public health and sanitation, and

water pollution (United Nations Development Programme, 2013a). With several of the countries in the sub-region producing oil, the region is also threatened by oil pollution (Abe et al., 2016).

GEF support for the Gulf of Guinea LME began with the UNDP and United Nations Industrial Development Organization (UNIDO) pilot-phase project “Water Pollution Control and Biodiversity Conservation in the Gulf of Guinea Large Marine Ecosystem (LME)” (United Nations Development Programme, 1992). Implemented between 1995–1999 in collaboration with Benin, Cameroon, Cote d'Ivoire, Ghana, Nigeria, and later Togo, the project promoted greater cooperation between government authorities and institutions that were involved in water pollution control and habitat conservation activities (United Nations Development Programme, 1992). Toward the end of the pilot phase, a meeting of the Ministerial Committee of the GCLME took place in Accra, Ghana in July 1998. Eager to preserve the success of the pilot phase, the Ministers adopted the Accra Declaration on Environmentally Sustainable Development of the Large Marine Ecosystem of the Gulf of Guinea (Accra Declaration, 1998; United Nations Development Programme, 2013a). The Ministers called for the countries to support the continuation of the project as well as its extension to all sixteen littoral states of the LME. Furthermore, the communiqué issued afterward stated,

**TABLE 2 |** Highlighted results of the TDA-SAP process and LME Approach in the Benguela Current LME, as well as unique lessons learned from the intervention (United Nations Development Programme, 2008; United Nations Development Programme, 2012a).

| Timeframe of the UNDP/GEF intervention | Key governance related results achieved/features in the SAP   | Unique lessons learned and best practices  |
|--|---|--|
| 1998–2014                              | <ul style="list-style-type: none"> <li>• A landmark step for the Benguela Current LME was the establishment of the interim Benguela Current Commission as a prelude to the formal commission. Protection of the LME had been undermined by gaps in legal frameworks of the countries, especially the lack of laws regulating transboundary activities (i.e., marine mining and offshore petroleum exploration/production);</li> <li>• Establishment of the Africa LME Caucus;</li> <li>• Capacity building and legislation started to reverse the threats of deteriorating water quality, invasion of alien species, declining fish stocks, and habitat destruction in the LME;</li> <li>• New legislation on aquaculture were adopted by Angola and Namibia to encourage the development and quality of products, including shellfish production, and resulted in the development of an implementation plan for regional aquaculture policy options;</li> <li>• All three countries adopted the MARPOL agreement and follow up actions included the development of a regional oil spill contingency plan project and monitoring systems were put in place to measure harmful algal blooms, temperature, salinity and oxygen;</li> <li>• In 2005, Angola had rejected an agreement allowing EU vessels to fish in its waters, with the exception of Spanish vessels with 51% Angolan ownership and under strict Angolan regulatory control and monitoring;</li> <li>• By 2008, an Environmental Management Bill and the Pollution Control and Waste Management Bill were put up for debate in Namibia;</li> <li>• Measures were adopted to reduce fisheries by-catch and reduce the impact of longline fishing on seabirds;</li> <li>• Governments of the BCLME issued exploratory fishing licenses for stocks, which were previously not regarded as target species (e.g., clams, squid, jacoever).</li> </ul> | <ul style="list-style-type: none"> <li>• The use of a science-based approach to fundamental understanding of the ecosystem is essential, but should be complemented by management-orientated actions;</li> <li>• The TDA/SAP cycle during the PDF-B phase was beneficial, but should be considered preliminary and reiterated during implementation of a donor funded project;</li> <li>• A preliminary SAP was beneficial, but future SAPs should include a Vision Statement and Ecosystem Quality Objectives to help overcome imperfect country compliance with the priority actions laid out;</li> <li>• In a first project phase, management changes are difficult to achieve and any such targets should be realistic and not included if in doubt;</li> <li>• A strategic plan for capacity building should be undertaken at the TDA/SAP stage and should be designed to encourage national staff to stay in the system;</li> <li>• Harmonization of national legal frameworks at the regional level had proven to be an unrealistic target. The BCLME project had influenced the development of fisheries legislation in Angola and environmental legislation in Namibia, indicating underlying policy convergence. The major challenge to harmonization, however, were the varying legal systems within countries. Thus, it was recommended that focus should be at the level of policy harmonization and cooperation through operational plans;</li> <li>• Stakeholders had specific expectations in their own areas of interest in relation to policy actions of the SAP (i.e., mariculture regulations and policy, marine conservation plans). Throughout the evolution of the BCLME project, these expectations became more realistic and less ambitious over time.</li> </ul> |

*inter alia*, “The development of a Strategic Action Program including a full Transboundary Diagnostic Analysis leading to the second phase of the project should be initiated and accelerated” (United Nations Development Programme, 2013a). In response, a request was submitted to the GEF through UNDP for a PDF Block B project preparation grant for the “Development of a Strategic Action Program for the Guinea Current Large Marine Ecosystem (GCLME)” project (United Nations Development Programme, 2006). Under the umbrella of the Abidjan Convention (Convention for Cooperation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region, 1981) and with the support of GEF, UNDP, UNEP, UNIDO, FAO, and the National Oceanic and Atmospheric Administration (NOAA) of the United States and other stakeholders, the project development was initiated in 2001.

By 2004, GEF funding was received for a full sized project titled “Combating Living Resources Depletion and Coastal Area Degradation in the Guinea Current Large Marine Ecosystem (GCLME) through Ecosystem-based Regional Actions” under the direction of UNDP and UNEP, in collaboration with UNIDO (Global Environment Facility [GEF], 2020). This foundational project, which ran until 2012, achieved major milestones for the GCLME, including the completion of the TDA in 2006 (United Nations Development Programme, 2006). In the same year, a Ministerial meeting reaffirmed regional commitment to the LME by institutionalizing cooperation under the Abuja Declaration (2006) and creation of a technical Interim Guinea Current Commission (IGCC) in the framework of the “Abidjan Convention” (Convention for Cooperation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region, 1981; United Nations Development Programme, 2013a). By 2007, the SAP had been completed and signed by government representatives of all the GCLME countries (United Nations Development Programme, 2007c). A second Ministerial meeting in July 2010 led to the Osu Declaration, reaffirming support for the creation of the Guinea Current Commission (GCC) and launching the consultation process for its creation. With the institutional structure established, a Regional Coordination Unit was in place to support the consultation and joint actions while also serving as the Executive Secretary of the IGCC (Humphrey and Gordon, 2012). By May 2012, a draft treaty for the establishment of the GCC had been prepared for discussion and decision making by the Ministerial Committee. This led to the Abidjan Declaration (2012), reiterating support for creation of a Guinea Current Commission and determining that this should be established through a protocol to the “Abidjan Convention” (Humphrey and Gordon, 2012). During the 12<sup>th</sup> Conference of the Parties (COP12) of the Abidjan Convention, a resolution was adopted where the GCC should be operational by 2020 (United Nations Development Programme, 2013a). Through a new GEF funded project supported by UNEP, UNDP, FAO and UNIDO, the countries will continue to build on the policy direction of the SAP and address the remaining governance gaps related to establishing a permanent GCC (United Nations Environment Programme, 2017). The

highlighted results and unique lessons learned during the UNDP/GEF intervention from 1995–2012 are summarized in Table 3.

## ENHANCING COORDINATION MECHANISMS IN THE CARIBBEAN AND NORTH BRAZIL SHELF LMES (CLME+)

Jointly referred to as the CLME+, the Caribbean LME (CLME) and the North Brazil Shelf LME (NBSLME) are highly connected both biophysically and politically (United Nations Development Programme, 2014a). This extensive marine environment is characterized by globally significant levels of biodiversity that provide ecosystem services supporting livelihoods, human well-being and socio-economic development for the region and beyond (Debels et al., 2017). Two key drivers of the region's economy are tourism and fisheries, the latter supported by three distinct ecosystem types: the reefs and associated systems, the pelagic ecosystem, and the continental shelf ecosystem (United Nations Development Programme, 2014a). The capacity for these ecosystems to continue to provide goods and services has become increasingly impacted by environmental problems such as habitat degradation, unsustainable fisheries practices and pollution, all of which jeopardizes the region's opportunities for blue growth (United Nations Development Programme, 2014a).

According to Mahon et al. (2010), the CLME+ is one of the most geopolitically and biophysically complex marine regions in the world. In order to be prosperous and sustainable, any attempt at addressing the main threats to the region's marine ecosystems would require the cooperation of all forty-four countries and territories that have a stake in the CLME+ (United Nations Development Programme, 2016). The diversity of cultural, economic and geopolitical realities in the CLME+ has resulted in a largely fragmented approach to management and governance of the marine environment and key resources (United Nations Development Programme, 2014a).

The creation of a region-wide, cooperative governance framework through the use of the TDA-SAP process began with two phases of project development funding (PDF), first in 2001 as a PDF Block A Grant and then from 2006–2008 under a GEF PDF Preparatory Block B Grant (CLME, 2007). During the PDF B Phase, a preliminary analysis of the transboundary problems in the CLME was undertaken with the region sub-divided into Insular Caribbean, Central/South America and Guianas/Brazil (Whalley, 2011; Debels et al., 2017). The PDF-B phase highlighted the importance of effective governance to address sustainable use of living marine resources in the Wider Caribbean, and the need for a specific framework targeted at interventions to bring about the necessary change in regional fisheries governance (Mahon et al., 2011).

Recognizing that the condition of the Caribbean Sea required immediate attention and action, national governments successfully obtained GEF funding in 2009 and collaborated with the UNDP, UNOPS and the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (IOC-UNESCO) to implement the

**TABLE 3 |** Highlighted results of the TDA-SAP process and LME Approach in the Guinea Current LME, as well as unique lessons learned from the intervention (Humphrey and Gordon, 2012; United Nations Environment Programme, 2017).

| Timeframe of the UNDP/GEF intervention | Key governance related results achieved/features in the SAP  | Unique lessons learned and best practices  |
|--|--|--|
| 1995–2012                              | <ul style="list-style-type: none"> <li>• More than one hundred environmental experts had been trained in drafting and implementing common standards, policies and legislation;</li> <li>• Integrated Coastal Area Management Plans were adopted by all participating countries with national steering committees formed to guide the process, and country coast profiles had been published;</li> <li>• Port reception facilities were established in Nigeria, Ghana and Cote D'Ivoire, enhancing ballast water management capacity;</li> <li>• Industrial effluent regulations and standards had been established for the region and were adopted and enforced by several countries. Best practice in the reduction, recovery and recycling of municipal and industrial solid waste in Ghana, had been extended to other countries of the GCLME;</li> <li>• To conserve fisheries, a regulatory policy had been adopted with closed and open seasons. The licensing of distant water industrial fishing fleets was halted under the Accra Declaration, effectively reducing the extreme pressure on fisheries resources from large commercial offshore fishing fleets from the EU, Eastern Europe, Republic of Korea, and Japan;</li> <li>• Since the creation of the Interim Guinea Current Commission, several key partnerships had been forged and agreements entered into, including:               <ul style="list-style-type: none"> <li>◦ Joint programming with the International Petroleum Industry Environmental Conservation Association (IPIECA) on oil spill prevention and response</li> <li>◦ Coordination with the Gulf of Guinea Commission (GGC) on Security and Socioeconomic development</li> <li>◦ MoU for joint programming with the Fishery Committee for the West Central Gulf of Guinea (FCWC)</li> <li>◦ LOA with the International Maritime Organization (IMO) for ballast water management and oil spill contingency planning</li> <li>◦ MoU for joint programming with Regional Fisheries Committee for the Gulf of Guinea (COREP).</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• While the role of the Regional Coordination Unit (RCU) to serve as the Secretariat for the Interim Guinea Current Commission (IGCC) was strategically a means to save funds and provide the platform for sustaining results achieved, the dual role created a false sense of security in the financial support for the Commission and created confusion in terms of accountability. While the RCU was in a good position to champion the future Guinea Current Commission, playing an impartial facilitation role was difficult;</li> <li>• A key lesson from the GCLME projects of relevance to other regional initiatives is to ensure a clear independence between the project and the institutional mechanisms they are trying to create. However, it is important to remember that the relationship between the two can be expected to differ on a case by case basis;</li> <li>• Despite strong political support, country ownership can become weakened if there is lack of empowerment of national structures. Inter-Ministerial Committees played an active role in developing and endorsing the national plans of action on land-based sources of marine pollution (NPAs-LBS) and National Programs of Action (NAP), however the difficulty of maintaining consistent representation compromised their mainstreaming role;</li> <li>• While there was little evidence of national policy changes in key sectors such as fisheries, pollution, and habitat management, the SAP and NAP, legal studies, NPAs on land-based sources, and sectoral plans paved the way for future actions.</li> </ul> |

Caribbean Large Marine Ecosystem Project. The Project aimed to help the countries and territories in the region unite their efforts to establish a more coordinated ecosystem-based approach to management (United Nations Development Programme, 2009a). In 2010, in a meeting between the Technical Task Team and Stakeholder Advisory Group it was agreed that an updated TDA should focus on the three ecosystems representing the key types of fisheries of the CLME (reef, pelagic and continental shelf fisheries ecosystems) as coastal and marine fisheries take place in one of these ecosystem types (Whalley, 2011). Under the Project, four TDA reports were prepared: Reef and Pelagic Fisheries TDA, Continental Shelf Fisheries TDA, Regional TDA, and a Governance TDA (United Nations Development Programme, 2014a). The three priority environmental problems, highlighted through these TDAs and common to the three ecosystem subtypes, were: (1) unsustainable exploitation of fish and other living resources; (2) habitat degradation and ecosystem community modification; and (3) pollution. The causal chain analysis conducted under the Project identified weak cross-sectoral governance arrangements as the over-arching root cause of the transboundary problems affecting the CLME and adjacent regions (United Nations Development Programme, 2014a). The results of these TDAs were combined with the knowledge and insights from case studies and pilot projects to produce the Strategic Action Program for the Sustainable Management of the Shared Living Marine

Resources of the Caribbean and North Brazil Shelf Large Marine Ecosystems (United Nations Development Programme, 2013b). The countries of the CLME+ region approved the ten-year SAP that had an initial focus on governance and management of shared living marine resources. The cooperation between the Caribbean Regional Fisheries Mechanism (CRFM) and the Central America Fisheries and Aquaculture Organization (OSPESCA) under a signed Memorandum of Understanding in 2012, and the development of an Oceans Governance Policy by the Organization of Eastern Caribbean States (OECS) were important milestones that complemented and supported the SAP (Debels et al., 2017). The highly participatory process during the development of the SAP facilitated national and regional-level ownership of its content and priorities (Debels et al., 2017). By 2014, thirty-one Ministers in twenty-two countries had endorsed the SAP, making it the most widely endorsed Action Program within the GEF International Waters Focal area (United Nations Development Programme, 2016).

The SAP provides the region with an integrative, formal “umbrella” framework for action that enables information exchange and cooperation among the various active initiatives and projects taking place within the CLME+, ultimately leading to enhanced coordination and decision-making (United Nations Development Programme, 2014a). To achieve this, a regional governance framework of consolidated, inter-linked and complementary organizations was suggested (Debels et al.,

2017). This nested and multi-level approach would allow regional and sub-regional organizations with existing mandates for dealing with the identified transboundary threats to be further strengthened via the framework, and enables stakeholders to identify their roles and interactions needed with one another for effective governance (Debels et al., 2017).

To catalyze the implementation of the CLME+ SAP, a five year GEF financed and UNDP supported CLME+ Project was initiated in 2015. By July 2017, the Project had formally established an Interim Coordination Mechanism (ICM) for the CLME+ region through the signature of an MoU by five regional intergovernmental organizations including the Organization of the Central American Fisheries and Aquaculture Sector (OSPESCA), the Caribbean Community (CARICOM) Secretariat, the Caribbean Regional Fisheries Mechanism (CRFM), the Central American Commission for Environment and Development (CCAD), and the Organization of Eastern Caribbean States (OECS) Commission (CLME+ PROJECT, 2017). The Western Central Atlantic Fisheries Commission of the UN Food and Agriculture Organization (UN FAO-WECAFC), the IOC Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE), and UNEP represented by its Caribbean Regional Coordinating Unit and Secretariat to the Cartagena Convention subsequently joined the ICM (CLME+ PROJECT, 2017). The ICM has been at the heart of the CLME+ Alliance and Partnership that is aiming to unite academia, civil society, donor and development community, governments, and the private sector, in a shared mission to safeguard the CLME+ region (CLME+, 2020a).

In June 2020, a milestone decision for the Wider Caribbean was reached on the proposed long-term regional “Ocean Governance” Coordination Mechanism in a response to a call for action under the CLME+ SAP. During a steering committee meeting of the GEF/UNDP CLME+ Project, more than twenty countries and fourteen organizations from the Wider Caribbean laid the foundations for the Coordination Mechanism and reached an agreement on its core aspects (CLME+, 2020b). The subsequent Special Session which took place in October 2020 enabled the countries and regional organizations to make substantial progress on the text for the MoU through which the Coordination Mechanism will be created, and at the time of writing further negotiations were ongoing with the aim of achieving formal endorsement of the Coordination Mechanism in early 2021 (CLME+, 2020b). The highlighted results and unique lessons learned during the UNDP/GEF intervention since 2001 are summarized in **Table 4**.

## **BUILDING UPON INTERGOVERNMENTAL ARRANGEMENTS IN THE WESTERN TROPICAL PACIFIC WARM POOL LARGE MARINE ECOSYSTEM**

Covering over ten percent of the Earth's surface, the waters of the Pacific Islands region hold the world's largest stocks of

tuna and related pelagic species (Pacific Islands Forum Fisheries Agency [FFA], 2018). Most of this area falls within the national jurisdiction of fifteen Pacific Small Island Developing States (SIDS), making them the custodians of a major international waters ecosystem (United Nations Development Programme, 2004b). The defining physical feature of this water body is the Western Tropical Pacific Warm Pool Large Marine Ecosystem (WTP LME). While the WTP is not always identified as an LME, it shares the major characteristics that define LMEs (United Nations Development Programme, 2004b). The importance of these waters in environmental and geographical terms is enhanced by the significance of the management aspects where the Pacific SIDS have developed a degree of cooperation that are globally important (United Nations Development Programme, 2004b).

At the center of this cooperation lies the concern over global, regional, and transboundary fish stocks. These stocks are highly migratory and have ranges extending the jurisdiction of twenty countries and into large areas of the high seas (United Nations Development Programme, 2011). Wherever these stocks occur, countries have a responsibility under international law to adopt measures for their management and conservation (United Nations Development Programme, 2012a). Without a coherent and legally binding framework to establish and apply measures, unregulated fishing and inconsistent measures in various national zones undermines the efforts of individual countries (United Nations Development Programme, 2004b).

The people of the Pacific Islands have always applied practices aimed at conservation of marine resources (United Nations Development Programme, 2004b). When stock assessments in the 1980's revealed that tuna stocks of the region were the largest in the world, it was only a matter of time before markets and technology would drive fishing to unsustainable levels (United Nations Development Programme, 2011). In 1990, the Pacific Island Countries decided to prepare a joint regional position to the 1992 United Nations Conference on Environment and Development (UNCED). The Conference provided the first opportunity for the Islands to gather information, analyze the results and build regional consensus on integrating environmental and developmental concerns into a sustainable whole, using their knowledge and experience gained in the twenty years since the Stockholm Conference on the Environment (South Pacific Regional Environment Programme, 1997; United Nations Development Programme, 2004b).

During a regional training and scoping workshop co-financed by the GEF in 1995, the UNDP together with the Secretariat of the Pacific Regional Environment Program (SPREP) and the Government of Australia agreed to develop a regional proposal for the preparation of a SAP. Following further regional and national consultation, the proposal was approved in 1997 (Tortell and Tarte, 2004). The SAP identified weaknesses in the extent to which decision-makers were able to access information necessary to understand the causes of unsustainable actions, and to respond to imminent threats. The lack of appropriately presented strategic information hindered decision-makers, resource users, managers and communities in evaluating the cost and benefits of alternative activities and to decide the best course of action

**TABLE 4 |** Highlighted results of the TDA-SAP process and LME Approach in the Caribbean LME, as well as unique lessons learned from the intervention (United Nations Development Programme, 2016; Merla, 2018).

| Timeframe of the UNDP/GEF intervention | Key governance related results achieved/features in the SAP  | Unique lessons learned and best practices  |
|--|--|--|
| 2001- Ongoing                          | <ul style="list-style-type: none"> <li>At a sub-regional level, the Caribbean Regional Fisheries Mechanism of the Caribbean Community (CRFM-CARICOM) and the Organization of the Fisheries and Aquaculture Sector of the Central American Isthmus (OSPESCA) of the Central American Integration System (SICA) subscribed a Joint Action Plan signed by ministers from nineteen countries to promote the implementation of an ecosystem approach across highly important regional fisheries (lobster, queen conch, and large pelagics);</li> <li>The Southwest Cay on the Pedro Banks in Jamaica was declared a Special Fish Conservation Area, and a Strategic Zoning and Fisheries Management Plan was completed for the Montecristi National Park of the Dominican Republic;</li> <li>The Ministerial Forum of the Caribbean Regional Fisheries Mechanism approved the first transboundary fishery management plan to be adopted in the CLME+ region (a Sub-regional management plan for the Eastern Caribbean Flyingfish Fishery);</li> <li>Caribbean fisheries ministers adopted an urgent action plan to save Caribbean coral reefs in collaboration with climate change and fisheries agencies within the Caribbean Community;</li> <li>To engage and empower civil society and private sector stakeholders in implementation of the CLME+ SAP, a complimentary CLME+ Civil Society Action Program (C-SAP) was developed in collaboration with the Caribbean Natural Resources Institute (CANARI);</li> <li>A Regional Plan for the Management of Caribbean Spiny Lobster has been developed, approved and adopted by Fisheries and Aquaculture Ministers of the Central American Integration System member states.</li> </ul> | <ul style="list-style-type: none"> <li>The results of a Governance Effectiveness Assessment indicates that there is room for greater regional collaboration when developing issue-specific policies. Furthermore, expanding collaborative development and implementation of governing instruments (e.g., coordinating mechanisms) at the regional level could foster a more consistent approach to addressing interconnected issues;</li> <li>More information is necessary to accurately assess the stressors exerted on the marine environment to determine which of these should be tracked to better inform SAP decision making;</li> <li>The interim Coordination Mechanisms established by the CLME+ project are examples of best practices for: <ul style="list-style-type: none"> <li>Successfully achieving actions set out under the CLME+ SAP strategies, especially those which focus on integrated and coordinated regional ocean governance;</li> <li>Building trust and enabling coordinated actions among regional Intergovernmental Organizations and other stakeholders;</li> <li>Enabling the creation of a long-term coordination mechanism for continued support of integrated ocean governance;</li> <li>Coordinated support for achieving regional and international goals and targets (e.g., SDG14, Aichi) across the region;</li> <li>Improved collaboration and coordinated communication between Coordination Mechanism members;</li> <li>Supporting and strengthening national level coordination.</li> </ul> </li> <li>The CLME+ SAP contains priority actions undertaken from a governmental/public sector perspective. However, successful governance of the region's shared living marine resources also demands the involvement of societal groups that have a direct stake in the management of these key resources;</li> <li>There are various science-policy interfaces for governance in the Wider Caribbean Region, therefore, developing strategies for improving the uptake of science into policy must consider all these difference interfaces. Understanding how they are structured and how they work would be very beneficial to the science community, especially for influencing policy decisions.</li> </ul> |

(United Nations Development Programme, 2004b). The SAP also identified weaknesses in governance at both the regional and national levels. A critical regional weakness was the paucity of legally binding institutional arrangements governing cooperation in the management of the region's commercial oceanic fisheries (South Pacific Regional Environment Programme, 1997). While there had been a high level of voluntary cooperation between Pacific SIDS there was not a formal collaborative process covering the range of the major stocks. At the national level, weaknesses in governance included lack of compatible management arrangements between zones, lack of political commitment to take hard decisions to limit fishing and catches, and a lack of capacity (South Pacific Regional Environment Programme, 1997).

To explore ways of addressing the threats identified in the SAP, the GEF funded and UNDP implemented "Implementation of the Strategic Action Program (SAP) of the Pacific Small Island Developing States" project was established. Operational from 2000–2004, the project had two major components, Integrated Coastal and Watershed Management (ICWM) and Oceanic Fisheries Management (OFM). *Inter alia*, the OFM component supported the Pacific Island countries in the negotiation of the

Western and Central Pacific Fisheries Convention (Convention on the Conservation and Management of High Migratory Fish Stocks in the Western and Central Pacific Ocean, 2004; Tortell and Tarte, 2004). The Convention was one of the first major regional applications of the 1995 UN Straddling Fish Stocks Agreement (United Nations Development Programme, 2012a). The development of the Convention was supported through a process coordinated by the Pacific Island Forum Fisheries Agency (FFA) that facilitated direct dialog between the Pacific SIDS, coastal states, and fishing states (United Nations Development Programme, 2011). Initiated by an invitation from Pacific Island leaders, stakeholders came together to discuss enhanced arrangements for managing the impact of fishing. Finalizing the Convention text required another thirteen meetings with all Pacific SIDS participating in all sessions, as well as a series of *ad hoc* dialogs with other fishing states (United Nations Development Programme, 2004b). The Convention entered into force on 19 June 2004, with twelve of the thirteen required ratifications being from Pacific SIDS, and brought into being the last of the tuna Regional Fisheries Management Organizations (RFMOs), the West and Central Pacific Fisheries Commission (United Nations Development Programme, 2011). In December

of the same year, a Western and Central Pacific Fisheries (WCPF) Preparatory Conference was established to prepare the foundation for the new WCPF Commission (United Nations Development Programme, 2004b). During the Conference, the rules of procedures and the organizational structure of the Commission had been formally adopted. Working via the FFA during 2005 to 2011, the subsequent GEF supported “Pacific Islands Oceanic Fisheries Management” Project guided the final stages of establishing the new Commission, determining how it will work, and the initial period of operation (United Nations Development Programme, 2011). It also supported Pacific SIDs’ efforts to reform, realign, restructure and strengthen their national fisheries laws, policies, institutions, and programs to take up the opportunities that the WCPF Convention created, and undertake the responsibilities outlined under the SAP (Hanchard, 2011). By 2011, the Commission was ratified by thirty-three of the thirty-four States and Territories that participated in the process (Hanchard, 2011; United Nations Development Programme, 2012a).

Following this success and commencing in 2014, the GEF supported a second project titled “Implementation of Global and Regional Oceanic Fisheries Conventions and Related Instruments in the Pacific Small Island Developing States”. Overseen by UNDP and FAO, and again managed by the FFA, the project focused on implementation of the work and activities of the Commission and its related instruments with additional key components supporting important SPC research into the impacts of climate change on tuna fisheries and the oceanic ecosystem (United Nations Development Programme, 2014b). Some key of the project activities have been delivered by providing support to important and influential regional entities, the most significant being the Office of the Parties to the Nauru Agreement (PNA) which entered into force in 1982 and utilizes a market-based mechanism (Vessel Day Scheme auctioning fishing days) to allocate sustainable levels of fishing activity across the purse seine fishery (United Nations Development Programme, 2014b).

The project has also supported important capacity building and human development activities across regional, sub-regional and national platforms (United Nations Development Programme, 2011). This has included a diverse range of training, workshops and meetings including the annual FFA Monitoring, Control and Surveillance Workshop (MCSWG) which sets the tone for the Regional MCS strategy and the very strategic annual Management Options Consultation (MOC) during which FFA Members consider priority matters for consideration by the annual session of the Western and Central Pacific Fisheries Commission and also the strategies to adopt in pursuing the agreed priorities in the course of the WCPFC meeting (United Nations Development Programme, 2011).

In 2014, Leaders of the Pacific Islands Forum endorsed a Pacific Vision for a region of harmony, peace, prosperity, security, and social inclusion (United Nations Development Programme, 2014b). The Framework for Pacific Regionalism (FPR) represents a long-term commitment to deeper regionalism as a means to achieve this vision. Strongly aligned with fisheries priorities under this Framework, the Project contributes to the annual progress reporting through Report Cards on Tuna Fisheries and Coastal

Fisheries to help fisheries managers meet the goals of the Regional Roadmap for Sustainable Pacific Fisheries (United Nations Development Programme, 2014b). A significant milestone of these efforts was demonstrated in the 2019 results of the Tuna Report Card on the state of health of tuna fisheries, which reported that all four species of economic importance in the region (skipjack, South Pacific albacore, yellowfin, and bigeye) are being fished sustainably (Pacific Islands Forum Fisheries Agency [FFA], 2019). The highlighted results and unique lessons learned during the UNDP/GEF intervention since 1997 are summarized in Table 5.

## TRANSFORMING THE YELLOW SEA LARGE MARINE ECOSYSTEM

The Yellow Sea is a semi-enclosed body of water bounded by the Chinese mainland to the west, the Korean Peninsula to the east, and a line running from the north bank of the mouth of the Yangtze River to the south side of Jeju Island (United Nations Development Programme, 2014c). For the purposes of defining the Yellow Sea LME project boundaries, the northwestern extent is a line drawn in a northeasterly direction from Penglai on the Shandong Peninsula to Lvshun of Dalian of People’s Republic of China (PR China) (Lenoci and Shuo, 2020). According to United Nations Development Programme (2014c), this international water-body supports substantial populations of invertebrates, fish, mammals, and water birds. These resources have been threatened by habitat loss from extensive economic development in the coastal zone, pollution, and by unsustainable exploitation of natural resources such as overfishing (United Nations Development Programme, 2012b). Additionally, there are threats from oil spills and collisions with marine mammals due to significant international shipping traffic through the waters of the Yellow Sea (United Nations Development Programme, 2014c).

Driven by their common concern for the Yellow Sea LME, PR China and the Republic of Korea (RO Korea) recognized the urgent need to address problems of reduced fish catches, red tide outbreaks, degradation of coastal habitats, and marine pollution through regional cooperation. Early concepts supporting the Yellow Sea Large Marine Ecosystem (YSLME) were the result of meetings held in 1992, sponsored by the World Bank and NOAA (United Nations Development Programme, 2007d). During the ensuing years, a PDF-B project was supported by the GEF under UNDP’s implementation. In August 1999, the first Steering Committee Meeting was held in Beijing, PR China (United Nations Development Programme, 2002). Later that year, RO Korea and PR China completed first drafts of their National Reports, which formed part of the technical basis for the PDF-B outputs (United Nations Development Programme, 2002). By 2000, a preliminary TDA (PTDA) was prepared as part of the Project Preparation exercise (United Nations Development Programme, 2007d). The PTDA provided background material for a Project Brief and a forum for consensus building on the environmental issues of highest priority in the Yellow Sea (United Nations Development Programme, 2000b). In 2005, the launch

**TABLE 5 |** Highlighted results of the TDA-SAP process and LME Approach in the Western Tropical Pacific Warm Pool LME, as well as unique lessons learned from the intervention (Tortell and Tarte, 2004; United Nations Development Programme, 2011; Chapman and Fong, 2018).

| Timeframe of the UNDP/GEF intervention | Key governance related results achieved/features in the SAP   | Unique lessons learned and best practices   |
|--|---|---|
| 1997- Ongoing                          | <ul style="list-style-type: none"> <li>Facilitated the full participation of Pacific Island States as primary stakeholders in the negotiation and development process for the Convention and Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific;</li> <li>Supported fifteen Pacific SIDS in conducting reviews of the legal, policy, and institutional arrangements, their national fisheries status, and management plans relating to the Convention;</li> <li>Supported the adoption and implementation by the WCPFC and the Pacific SIDS a range of innovative measures to promote sustainable fisheries, including: <ul style="list-style-type: none"> <li>The largest rights-based cap and trade management scheme in international fisheries (the Parties to the Nauru Agreement purse seine vessel day scheme);</li> <li>Seasonal closures on fishing on floating rafts (FADs) to reduce by-catches;</li> <li>A 30% reduction in catches of vulnerable bigeye tuna by major longline fleets;</li> <li>Large scale high seas closures to purse seine fishing vessels;</li> <li>Compulsory retention of catches of major tuna species;</li> <li>Measures to reduce shark finning;</li> <li>Ban on setting on whale sharks;</li> <li>Mitigation of by-catches of turtles and seabirds;</li> <li>The largest on-board observer program including one hundred percent coverage on tropical purse seine vessels;</li> <li>The only high seas boarding and inspection program in global tuna fisheries;</li> <li>World's largest international satellite-based vessel tracking (over two thousand high seas tuna vessels)</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>Small Island Developing Countries can make a difference by working together;</li> <li>Regional conservation measures and resource protection programs have improved the investment climate in oceanic fisheries - limits are good for business;</li> <li>Long term investments in science and data pay off;</li> <li>Monitoring and control programs create attractive jobs;</li> <li>There is a critical need for long term capacity building which goes beyond the scope of donor funded projects;</li> <li>Promoting the donor projects and their outcomes to individuals in foreign affairs, legislation, and government has a greater pay-off than focusing outward to create awareness and recognition;</li> <li>This case study demonstrates an example where a new commission with ecosystem-based requirements can complement an older regional seas convention on environment (the Noumea Convention);</li> <li>It could be argued that a strain is placed on countries to provide funding for a new commission, however; increased fees for licenses for distant fleets catching tuna, LME management, and some added national programs were paid for by the user (Hudson and Glemarec, 2012).</li> </ul> |

of the full sized “Reducing Environmental Stress in the Yellow Sea Large Marine Ecosystem” project under the support of the GEF and UNDP enabled participating countries to undertake a step-wise process by focusing on the preparation and completion of the region’s, National Strategic Action Plans (NSAPs), and the first SAP (United Nations Development Programme, 2007d). The SAP was endorsed in 2009 by both countries, while the Democratic People’s Republic of Korea (DPR Korea) supported as an observer, and served as a common regional framework with eleven regional targets and thirty-two management actions to be achieved by 2020 (United Nations Development Programme, 2009b). The proposed management actions included not only technical actions, but also governance actions. Specifically, the SAP suggested improving the effectiveness of legal instruments, to promote participation of a wide range of stakeholders, and to create an YSLME Commission (United Nations Development Programme, 2009b).

Following this highly successful phase I Project that ended in 2011, a second GEF funded project titled “Implementation of the Yellow Sea LME Strategic Action Program for Adaptive Ecosystem-Based Management” was approved by the Government of PR China, UNDP and UNOPS in July 2014 which was operational from 2017 until December 2020 (United Nations Development Programme, 2014c). Within the overall period of the two GEF-financed projects, important stress reduction achievements were demonstrated by the two YSLME countries. Under the SAP, tangible targets on reducing fishing efforts were agreed, including reducing 30% of the fishing boats. Guided by PR China’s five-year plan (2015–2020), about 22% of fishing vessels were reduced in the provinces

of Liaoning, Shandong and Jiangsu in the Yellow Sea area by 2018 (United Nations Development Programme, 2020). In addition, RO Korea’s five-year plan on reduction of fishing vessels showed a 17% decrease from 2011–2017. The countries had also committed to increasing the total area of critical habitats as Marine Protected Areas (MPAs) by 3%. From 2009 to 2019, the MPA areas in PR China and RO Korea grew from 2,051,366 ha to 2,210,741 ha, representing an increase of 5.52% of the total areas of the Yellow Sea (United Nations Development Programme, 2020). The governments of the participating countries also agreed to reduce pollution levels and improve water quality in the YSLME. By undertaking monitoring activities in line with the countries’ policy frameworks on marine pollution management, a significant decrease in marine litter has been reported as a result of improved practices in both countries. From 2010 to 2018, PR China saw a decrease in the density (items/km<sup>2</sup>) in both floating macro (> 10cm) and meso (< 10cm) litter in the surface water. From 2010 to 2017, the mean density of benthic litter of monitoring sites was about 130 items/km<sup>2</sup> (United Nations Development Programme, 2020). By 2018, the density of benthic litter (primarily plastics), in the monitoring sites of the Yellow Sea was 75 items/km<sup>2</sup>. Similarly, RO Korea reported a decreasing temporal trend of distribution of macro debris, indicating that the number, weight and volume decreased significantly along the coastline in the 10-year period (2008–2017). To control coastal pollution and improve water quality (COD level), RO Korea implemented a Total Pollution Load Management System for special management areas, including Sihwa Lake located within the LME. As a result, the water quality improved, showing a decrease in pollutant levels by

15% (United Nations Development Programme, 2020). Based on the 2007 TDA, one of the major environmental problems was the enrichment of nutrients in the Yellow Sea, and the major cause of harmful algal blooms (HABs) in the region (United Nations Development Programme, 2020). Through the SAP implementation project interventions, outbreaks of *Ulva* bloom in Qingdao, PR China have become less frequent and a decrease in the Maximum Distribution Area and Maximum Covering Area of Green Tide was reported from 2013 to 2017. In RO Korea, the number of HAB occurrences declined from 2014 with no red tide occurrence in 2016 and 2017 (United Nations Development Programme, 2020).

In December 2020, PR China and RO Korea agreed on the text for the Memorandum of Understanding (MoU) to establish the regional governance mechanism for the YSLME responsible for coordinating the implementation of the YSLME SAP 2020–2030 (Yellow Sea Large Marine Ecosystem, 2020), demonstrating the commitment of the countries for continuity and strengthening their cooperation for the future of the YSLME (Lenoci and Shuo, 2020). The highlighted results and unique lessons learned during the UNDP/GEF intervention from 1999–2020 are summarized in Table 6.

## SHORTCOMINGS OF THE PROCESS AND COMMON LESSONS LEARNED

The contribution of the TDA-SAP Process and LME Approach toward achieving regional ocean governance is not without controversy or critique. Bensted-Smith and Kirkman (2010) led

an analysis commissioned by Conservation International and concluded that LME projects funded by the GEF should invest in strengthening Regional Seas Programs and building links between institutions, as opposed to creating additional commissions. This finding was supported by a study commissioned by UNEP, where Rochette et al. (2015) found that a primary weakness of the LME Approach and TDA-SAP process was the absence of linkages to existing arrangements, decreasing the chances of sustainability and minimal uptake of the contributions made. Additionally, Fanning et al. (2015) identified that the spatial fit between LMEs and overlapping regional ecosystem-orientated arrangements were poor. More recently, a review undertaken by the United Nations Development Programme (2017) identified several factors that have impeded the effectiveness of the TDA-SAP Process and LME Approach, which include:

- Earlier TDA-SAP and LME Approach projects did not include civil society or the private sector at the early stages of development, stakeholders who should actively contribute to ocean governance measures;
- A test of sustainability is evaluating what elements of donor-funded project outcomes persist once the project has been completed and/or funding has ceased. A shortfall of the TDA-SAP process lies within the financial arrangements laid out post donor assistance. While there have been remarkable successes in LME management, stakeholders still perceive the award of a donor grant for continued support as a mark of “sustainability”. As identified in the

**TABLE 6 |** Highlighted results of the TDA-SAP process and LME Approach in the Yellow Sea LME, as well as unique lessons learned from the intervention (United Nations Development Programme, 2012a; Lenoci and Shuo, 2020).

| Timeframe of the UNDP/GEF intervention | Key governance related results achieved/features in the SAP   | Unique lessons learned and best practices   |
|--|---|---|
| 1999–2020                              | <ul style="list-style-type: none"> <li>• A regional Scientific and Technical Committee was established and Regional Working Groups were set up under thematic areas of ecosystem, investment, pollution, biodiversity and fisheries;</li> <li>• Regional guidelines for pollution monitoring were drafted which included suggested areas to be monitored, parameters, collaboration with existing national programs and recommendations for future regional monitoring activities;</li> <li>• Through the series of projects, national and regional commitments to international conventions and agreements were encouraged (i.e., United Nations Convention on the Law of the Sea (UNCLOS), the FAO Code of Conduct for Responsible Fisheries, and the Global Program of Action for the Protection of the Marine Environment from Land-based Activities);</li> <li>• Updated TDA (adopted in October 2020) and an updated SAP covering the period of 2020–2030.</li> <li>• To assist the operationalization of the YSLME governance mechanism, the Project put into operation the Interim Commission Council (ICC) supported by subsidiary bodies such as Regional Working Groups, the Inter-Ministerial Coordination Committees (IMCCs), National Working Groups, and the Project Management Office (PMO).</li> </ul> | <ul style="list-style-type: none"> <li>• Establishing Regional Working Groups across thematic subjects provided a good mechanism for facilitating effective regional cooperation at both the political and technical levels;</li> <li>• Collaborating with other regional initiatives (PEMSEA/SDS-SEA, NOWPAP, NEAMPAN, and others) enhances the likelihood that the results achieved will be sustained;</li> <li>• Sustainability plans should be prepared prior to the finalization of donor funded projects that outline all follow up actions to ensure durability of the results achieved;</li> <li>• Champions for sustaining the Yellow Sea Partnership (individuals and organizations) should be identified to facilitate and advocate for implementation of the sustainability plan;</li> <li>• Instituting the YSLME regional governance mechanism through the mandates of existing technical cooperation arrangements is a practical approach that should be built upon;</li> <li>• To help maintain consistency and coherency in addressing the issues faced by the YSLME, key stakeholders from the previous project phases were involved;</li> <li>• Considering the complex project strategy and time required to facilitate transboundary governance, a four year timeframe to implement a project in support of the SAP is too short;</li> <li>• To help facilitate better cross-sectoral, inter-sectoral, and regional cooperation, there should be interaction across the various working groups.</li> </ul> |

lessons learned from the case studies presented, there is a need for a road map to be included at the SAP endorsement stage which clearly outlines a mid to long term strategy for countries to maintain and own the results achieved;

- The inclusion of development financial institutions, especially regional development banks, would strengthen the implementation of the SAP. While absent from earlier TDA-SAP Process and LME Approach projects, concerted effort is being made to include activities and outputs of the SAP which align with their strategies;
- There is often a long transition period between the TDA-SAP development phase and then the actual implementation of a SAP. This creates a problem for LME management due to loss of capacity, uncertainty in the next steps, and lack of commitment;
- Harmonizing laws and policies between countries is necessary but ambitious, challenges to achieving such harmonization can create a loss of support to the SAP process;
- Poor performance and lack of commitment to the TDA-SAP and LME process is created if they are not embedded in the most appropriate institution(s), ultimately posing a risk to sustainability of the management of the LME.

The United Nations Development Programme (2017) review also identifies common lessons learned from the TDA-SAP Process and LME Approach that could inform and guide future initiatives, which include:

- Establishment of activity or regional centers in LME countries helps to instill a sense of ownership and commitment at a national level;
- Anchoring the TDA-SAP process in an institute which has well established regional experience and has facilitated decision making provides a solid foundation for collaboration and sustainability of the management objectives;
- The development of National Action Plans which complement the SAP implementation process has proven to be beneficial in providing additional support to the transboundary management process;
- Creating strong partnerships within the LME enables the distribution of responsibilities and sharing accountability among stakeholders;
- Governance assessments are a valuable tool to the TDA for identifying the shortcomings of existing governance arrangements;
- The “user pays” approach through licenses and fees from LME-wide processes has the potential to provide additional funding for national and transboundary institutions;
- The TDA-SAP process and LME Approach have been well documented; ensuring that lessons learned and best practices are captured for replication and guidance to future initiatives.

As described by GEF LME:LEARN (2020), effective LME governance is a complex and dynamic challenge. The following policy recommendations have been identified to strengthen

transboundary LME governance: (a) important trade-offs should be evaluated when considering binding and non-binding agreements for long-term transboundary LME governance; and (b) national legislative endorsement of the SAP or a similar strategy planning document can lead to long-term success, not just within national boundaries, but also at the scale of LMEs (GEF LME:LEARN, 2020).

The GEF International Waters focal area has been recognized as an active player directly involved in strengthening regional ocean legal agreements and frameworks, with documented support to eight of the eighteen regional seas conventions and five regional fisheries commissions (Global Environment Facility Independent Evaluation Office, 2018). While concerns have been raised about the governance structures related to LME-wide management, good successes have been identified with sensible recommendations for improvement of the process.

## CONCLUSION

The journey toward negotiation, ministerial endorsement and effective implementation of a LME Strategic Action Program can represent an outcome of almost two decades or more of collaborative work toward building and sustaining regional approaches to effective ocean governance. They are the product of considerable regional consultations and a well-documented GEF International Waters science to policy process (TDA-SAP Process). As reflected in the LME Approach examples shared, the process is highly adaptable to regional circumstances, especially where considerable scientific support is present and a mechanism is required to navigate the obstacles in transboundary governance to accelerate progress in sustainable management. While there are instances where it has been necessary to go beyond the traditional TDA framework and to carry out more innovative analyses at different levels, the experiences and lessons learned are of great value for replication in other regions. Establishing clear priorities for action as demonstrated by the TDA-SAP Process enables the coordination of policies, institutional reform, and national/regional investments. Notably, the development and endorsement of a SAP is a significant milestone toward achieving regional ocean governance, however; sustained efforts by all stakeholders is a necessity to ensure the sustainability of ecosystem services for livelihoods, economic and social development. It is evident that the TDA-SAP Process has improved governance in LMEs and benefited transboundary countries, but it can be made more effective by applying the common lessons learned and recommendations proposed.

## AUTHOR CONTRIBUTIONS

ND wrote most of the manuscript with contributions from AH, VM, MH, and IT. All authors contributed to the article and approved the submitted version.

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# Advancing Ocean Governance in Marine Regions Through Stakeholder Dialogue Processes

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The poor state of the ocean and the transboundary nature of the marine environment require bold action by States coordinated across sectors and territorial boundaries in order to deal with the manifold challenges the ocean is facing—and with it humankind. Cooperation and coordination among States and stakeholders in marine regions have proven to be important levers for policy implementation and to strengthen ocean governance, yet remain challenging. Transparent and engaging stakeholder dialogue processes have the potential to provide guidance for the necessary transformation toward ocean sustainability and support the attainment of Sustainable Development Goal (SDG) for the ocean, SDG 14 and other interlinked ocean-related targets. The aim of this study is to review the challenges and opportunities of current collaborative efforts, namely multi-stakeholder dialogue and exchange processes, within and between marine regions to accelerate transformative action, contributing to these global goals. This paper builds on knowledge co-production and collaborative governance literature, and reviews experiences by stakeholders with ocean-related science-policy interfaces in an effort to strengthen regional ocean governance. As an exemplary case of such interfaces, this study assesses the Marine Regions Forum, a newly established inclusive dialogue and exchange platform for diverse actors from marine regions that aims to provide an informal space for joint learning and support regional action and international governance processes alike. Employing latent content analysis of interviews with experts, critical common barriers that hamper current collaborative efforts amongst stakeholders in marine regions are identified, such as fragmented governance frameworks, power and resource imbalances, and lack of meaningful stakeholder engagement. Pathways to address these challenges, such as through common goal orientation, contextualisation, inclusivity, trust building and meaningful continuous interactions are also identified. This paper concludes by discussing the value added of transparent and inclusive collaborative processes in the transformation of ocean governance toward achieving sustainability.

**Keywords:** marine regions, stakeholders, participation, science-policy, knowledge exchange, collaborative processes, ocean governance, sustainability

## INTRODUCTION

The current ocean management and governance frameworks are often referred to as fragmented and critiqued for not effectively addressing threats to the ocean (Chung, 2010; Rochette et al., 2015; Heinrich Böll Foundation, 2017; Watson-Wright and Luis Valdés, 2019) as the frameworks are largely built on the matrix of traditional sector-based or issue-based mechanisms. This approach is seen to hinder concerted action toward achieving sustainability goals, specifically the Sustainable Development Goal (SDG) 14 “Life below water” of the United Nations’ 2030 Agenda for Sustainable Development (United Nations, 2015). Due to the interconnected nature of the 2030 Agenda and SDGs, a fundamental prerequisite to the successful implementation of the SDGs includes ensuring that multiple actors work together across scales, times, and diverse contexts (Bowen et al., 2017; Schmidt et al., 2017; Stafford-Smith et al., 2017). This also applies to the ocean, and given the specificities of the marine environment including its transboundary nature, responses need to be collaborative across sectors, stakeholder groups, and territorial boundaries in order to be truly effective.

A well-recognised enabler of transformative change toward sustainability is the evolving and promising cluster of collaborative approaches, namely participatory and transdisciplinary practices (Mauser et al., 2013; Norström et al., 2020; Schmidt et al., 2020). As explained in Mauser et al. (2013), knowledge integration and transdisciplinarity is an iterative process that requires self-reflexivity and consists of co-design, co-production, and co-dissemination. Integrated marine governance through stakeholder engagement across sectors and levels is increasingly being committed to in ocean sustainability practices and marine governance framework (Van Tatenhove, 2011), yet they are far from being widely implemented or assessed. Further, practices of co-production are highly variable (Bremer and Meisch, 2017). Although this provides space for flexibility in approaches, it limits the ability to learn from them and improve their effectiveness (Norström et al., 2020) to ultimately foster the transformative change that is needed.

There is a rich body of literature on the co-production of knowledge in the science-policy system (Dale and Armitage, 2011; Cvitanovic et al., 2014, 2015; West et al., 2019; Norström et al., 2020) as well as on collaborative governance theories and practices (Booher, 2004; Ansell and Gash, 2007; Voorberg et al., 2015) upon which this paper builds. In the context of governance, Dale and Armitage (2011) define knowledge co-production as “the collaborative process of bringing a plurality of knowledge sources and types together to address a defined problem and build an integrated or systems-oriented understanding of that problem.” Drawing on this literature, this paper refers to collaborative processes within the context of multi-stakeholder processes and knowledge co-production in formal and informal settings of regional ocean governance, either within or between marine regions.

Limited research has been conducted on evaluating collaborative efforts and processes specific to ocean governance (Berkowitz et al., 2020). Efforts have been made to for example analyse the financial benefits of multi-national collaborations

for marine conservation (Mazor et al., 2013) and to assess the meta-organisations to identify conditions for successful cooperation in ocean processes (Berkowitz et al., 2020). Yet the majority of the literature focuses on tool-specific stakeholder engagement, for example, marine spatial planning (Ritchie and Lewis, 2003; Gopnik et al., 2012) or integrated coastal zone management (Le Tissier and Hills, 2010). The scope and nature of participatory engagement within ocean-related processes was long described as “a neglected topic” (Ritchie and Ellis, 2010). With this perspective, the current paper aims to contribute to the literature and bridge the gap by assessing collaborative efforts and strategies, specifically multi-stakeholder and cross-sectoral engagement for joint-learning and exchange in marine regions.

There is a dire need to enhance genuine collaborations which are multi-stakeholder and cross-sectoral within and between marine regions. However, most mechanisms that could deliver such opportunities are bound to policy or governance mechanisms, potentially discouraging open exchange and not necessarily fostering innovation. In response to this, Germany announced in 2017 at the UN Ocean Conference in New York, and then together with the European Union (EU) at the 2017 Our Ocean Conference in Malta, that a platform would be setup by 2020 to bring together diverse range of stakeholders to strengthen cooperation and to support the development of new approaches for integrated ocean governance at the regional level (United Nations, 2017). The Marine Regions Forum (henceforth, also the Forum) emerged from this commitment and was setup as an informal, transdisciplinary, and participatory space at the science-policy interface for marine regions. The Forum aimed to investigate policy, management, and governance innovations, in order to facilitate collaborative work that could trigger transformative change for current ocean sustainability challenges.

The first international conference of the Marine Regions Forum was held in Berlin, Germany, from 30 September until 2 October 2019 as an in-person event and brought together over 200 international participants from multiple sectors and stakeholders groups and different marine regions (see Institute for Advanced Sustainability Studies et al., 2020; Neumann et al., 2021). It took the form of a dialogue-oriented conference that included a mixture of interactive workshops and plenary discussions and was complemented by a side programme to foster a creative space for open, informal and productive exchange. From concept development over planning and hosting of the Forum, a co-creative, transdisciplinary, and participatory approach was employed in which independent research institutes worked together with experts from policy-making and civil-society (see Neumann et al., 2021). The Forum strived to support transformations toward integrated ocean governance for marine regions by advancing multi-stakeholder dialogue, facilitating exchanges of good-practices and cooperation between marine regions through joint-learning processes. The informal nature of the Forum provided a space outside of formal governance arrangements where stakeholders engage in discussion on equal footing as individual experts. It functions as a newly established inclusive dialogue and exchange platform, bringing actors together across multiple stakeholder groups, sectors, and marine regions in a genuine effort to enable the transformative

change for the sustainable use and conservation of marine environments. The Forum aims to facilitate action at the regional level, thereby supporting the implementation of the 2030 Agenda for Sustainable Development, in particular SDG 14, and build a bridge to a post-2020 pathway for ocean health.

Building on collaborative governance theory, specifically Ansell and Gash (2007) and knowledge co-production principles (Norström et al., 2020), this paper seeks to identify the challenges of implementing collaborative processes and strategies in marine regions and underpin practical pathways to overcoming these challenges. In assessing the Marine Regions Forum 2019 as a case study, this paper demonstrates how collaboration can be fostered within and between marine regions and examines the value added and transformative potential of such practices for formal ocean sustainability processes, including at the global scale. Building on a theoretical framework developed from the relevant scholarly literature, specifically on Ansell and Gash (2007) who provide a model to identify challenges and limitations of collaborative strategies, empirical insights are gained through latent content analysis of interviews conducted with selected experts and participants of the Marine Regions Forum 2019.

Providing a universal prescriptive definition of the term “marine regions” is challenging within the scope of this paper, given that the spatial and institutional boundaries of marine regions can overlap, are variable, region-specific and also complex from a political, legal and ecological perspective. Literature has delineated marine regions based on various different characteristics, including oceanography, Marine Ecoregions, Large Marine Ecosystems boundaries (Morgan, 1991; Spalding et al., 2007), or hierarchical clustering of regional arrangements (Mahon and Fanning, 2019). Mahon and Fanning (2019) defined 20 ocean regions based on the UN Environment’s Regional Seas regions and other regional institutional arrangements, corresponding to the coasts and semi-enclosed seas of the continents. Although it seems reasonable to define marine regions, this paper acknowledges the diversity of geopolitical conditions of marine regions and that there is no uniform definition and globally applicable way to set boundaries. Further, dialogue and exchange processes can take place between the global and regional level (i.e., in an effort to harmonise and implement global targets), within and between marine regions (i.e., facilitating action from the global to national level), and between the regional and national level (i.e., to support on-the-ground implementation). The scope of this paper concentrates on the regional and interregional level and further links this to global processes.

## MATERIALS AND METHODS

The analytical framework that guides this paper builds on knowledge co-production principles (e.g., Norström et al., 2020) and collaborative governance models, in particular Ansell and Gash (2007) who provide a contingency theory of the critical variables found to be important in collaborative governance processes. These included “prior history of conflict or cooperation, incentives for stakeholders to participate, power

and resources imbalances, leadership, and institutional design” (Ansell and Gash, 2007). Based on these variables, semi-structured, in-depth interviews were conducted to explore multi-stakeholder dialogue and collaborative processes in and across marine regions, how they can foster transformative action to support SDG 14 implementation, as well as understand how informal dialogue platforms can facilitate transformation toward ocean sustainability.

To provide an in-depth case study, the Marine Regions Forum, as an example for a transdisciplinary and collaborative initiative, is reflected upon and utilised to assess the potential and limitations of genuine efforts to enable inclusive dialogue and exchange within and between marine regions. The Forum sought to provide new and innovative ways for inclusive dialogue and exchange on various issues relating to ocean governance with a focus at the regional level. At its first international conference in autumn 2019, it brought together a diversity of actors from different sectors and marine regions to engage in informal joint learning and collaboration, in an effort to create new knowledge, bridge gaps between efforts and strengthen regional governance through new partnerships or approaches. Participants were individually selected and invited by the Forum organisers in order to facilitate a balanced representation of stakeholder groups and regions. The majority of the participants at the Marine Regions Forum 2019 were from research (37%), followed by intergovernmental organisations (24%), government (19%), and NGOs (13%). 1% of the participants were from industry and 4% were categorised as artists. The expertise of half the participants (50%) was at the global level, while the other half of the participants mainly specialised on particular marine regions, for example, the Western Indian Ocean, South East Atlantic, Pacific, or Arctic. With regards to gender representation, 55% were male and 45% were female. Under the leadership of three research institutions who provided core conceptualisation and scientific perspectives, the Forum was co-produced by an interdisciplinary team of ocean researchers and experts, together with a steering group who provided governmental and policy perspectives, and an advisory board of esteemed experts for global and regional level stakeholder and science perspectives (see Neumann et al., 2021). The ambition of the Forum was to position itself outside of formal governance processes and enable common understandings of challenges and opportunities faced by marine regions, and ultimately, to facilitate collective responses. The purpose of the Forum was to support and complement existing efforts by organising an innovative forum for exchange and cooperation.

Expert interviews were conducted during June 2020, 8 months after the Marine Regions Forum 2019 took place. To assess if the interview questions were comprehensible, unambiguous, and informative to the objectives of the study, a preliminary test-interview was conducted internally with a research group member, the data of which was excluded from this studies analysis. Due to the geographical distribution of the interviewees and restrictions due to the COVID-19 pandemic, interviews were held online through a video communication portal. Interviews ranged in length from approximately 40 to 60 min and were held in English. The timing of the interviews was purposively

conducted several months after the Marine Regions Forum 2019 took place, in order to provide the ability to study longer-term outcomes of the first Forum. However, it should be acknowledged that such an extended time period can also lead to potential recall-biases by interviewees.

Interviewees were selected from the pool of attendees present at the Marine Regions Forum 2019 through “purposive” sampling (Ritchie and Lewis, 2003). To ensure data saturation – the point at which no new information or themes are observed in the data (Guest et al., 2006), 12 interview participants were identified and selected, of which 11 participated in this study. The interviewee selection process was based on a predetermined key criterion which targeted participants deeply involved with the topic while ensuring a diverse sample to capture the perspectives of different stakeholders. The key criteria considered the following characteristics of potential interviewees (relevance is indicated by the listed order): (i) attendance of the Marine Regions Forum 2019 which serves as a case study for this paper; (ii) experience with multi-stakeholder knowledge exchange frameworks in the context of SDG14 and ocean governance; (iii) representative of different stakeholder groups with practitioner focus (governmental organisations, intergovernmental organisations, non-governmental organisations, and research and academia); (iv) regional diversity; and (v) gender diversity. The regional representation of the interviewees included the following: Western Indian Ocean ( $n = 2$ ), Pacific ( $n = 3$ ), Caribbean ( $n = 1$ ), NW Atlantic ( $n = 1$ ), S Atlantic ( $n = 1$ ), and the global level ( $n = 3$ ). Interviewees were fairly evenly distributed across intergovernmental organisations ( $n = 4$ ), non-governmental organisations ( $n = 3$ ), and research and academia ( $n = 4$ ). Among the 11 study participants, there was a 5:6 female to male gender ratio. Although conducting interviews with representatives from industry would have provided another stakeholder group perspective, it was not possible given their overall low representation at the Marine Regions Forum 2019.

Potential interviewees from the pre-selected pool ( $n = 12$ ) were invited via email to participate in the study. An information sheet was provided to the participants in advance of the interview explaining the purpose of the interview and demands on the interviewee, and to collect informed consent. The informants were assured that confidentiality would be maintained throughout to allow for an open and honest dialogue. Furthermore, an interview guide (see **Supplementary Information 1**) was prepared to provide a structural frame for the interviews. Interview questions were grouped into two main themes: firstly, on the challenges and opportunities of current multi-stakeholder cross-sectoral exchange processes in and amongst marine regions, based on the analytical framework of this study which was derived from relevant literature (Ansell and Gash, 2007; Norström et al., 2020); secondly, on the interviewees perception of the Marine Regions Forum 2019 including lessons learned at an individual and collective level, and its transformative potential as an informal and inclusive collaborative processes to foster the transformation of ocean governance toward sustainability.

The interviews were recorded as audio files through the video communication portal. The recorded interviews were transcribed verbatim and subsequently investigated through latent content analysis to search for common themes upon which the data was categorised and codes were applied (Hay, 2010). The qualitative data was analysed with the coding software MAXQDA 2020 (VERBI Software, 2019). A hybrid approach of inductive and deductive coding techniques was conducted (see Fereday and Eimear, 2006) as an iterative and reflexive process. Inductive coding was implemented to identify variables that may only manifest in this context or dataset (data-driven) and deductive coding was used to build on the analytical framework of the study derived from literature (theory-driven). After initial coding of the interview data, the codes were subsequently refined and categorised upon which a codebook was developed (DeCuir-Gunby et al., 2011; see also **Supplementary Table 1**). The overall coding categorisation was based on the two main interview themes described above, under which sub-categories for individual codes were established to provide more detail and further operationalisation of the codes.

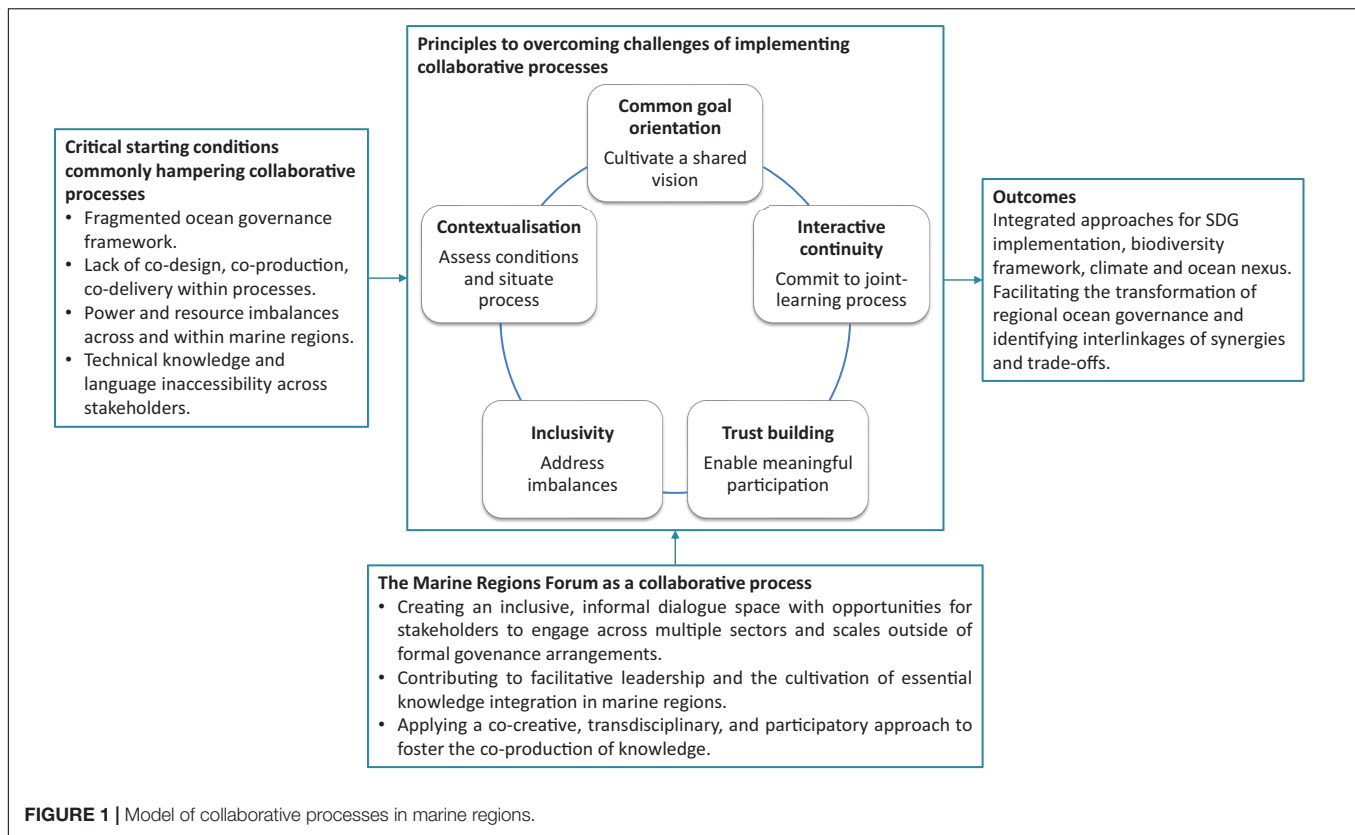
## RESULTS

The results are reported according to the key themes which emerged through the in-depth semi-structured interviews and general structure of the interview guide. The first section describes current multi-stakeholder processes in marine regions, including the challenges and principles to overcome such barriers. The second section relates directly to the Marine Regions Forum case study by exploring the participants’ perceptions of the 2019 event as a multi-stakeholder cross-sectoral dialogue platform. Key interview themes are presented below in a consecutive order; however, it must be recognised that collaborative processes are themselves iterative and non-linear.

It should be acknowledged that in general, collaborative processes are highly diverse and context-specific, especially across marine regions which challenge the ability to apply a universal approach to all collaborative efforts. However, across the board, there were overlaps regarding the interviewee’s perceptions on the challenges and potential pathways to address these in order to advance multi-stakeholder exchange processes in marine regions.

### Critical Starting Conditions Commonly Hampering Collaborative Processes in Marine Regions

The starting conditions present at the onset of new collaborative processes are critical as they can facilitate or discourage cooperation and coordination between stakeholders (Ansell and Gash, 2007). Interviewees stated that in ocean sustainability processes, common starting scenarios which discourage cooperation are the traditional sector-based approaches as well as the complex socio-economic structures amongst and within marine regions that usually result in uneven playing field (see **Figure 1**, left box). This has created governance landscapes that are fragmented and multi-layered. Spaces to encourage or facilitate multi-stakeholder cross-sectoral dialogue



**FIGURE 1 |** Model of collaborative processes in marine regions.

processes are considered rare in regional ocean governance, especially such where the private sector is present. However, according to the interviewees, efforts are increasing and meetings such as those held by regional instruments and conventions (Wright et al., 2017) are being opened to non-governmental organisations, civil society, and intergovernmental bodies. When spaces for engagement do exist, there is frequently a lack of understanding, preparedness, and training for stakeholders about what collaborative engagement is and how to meaningfully engage in such processes.

Interviewees emphasised that building trust and long-term commitments between stakeholders is key for successful collaborative efforts, but these are time-consuming processes which require interactive continuity of cooperation between stakeholders. Even if cooperation has been established, barriers to interactive continuity and trust can persist, especially under variable conditions. For instance, key stakeholders engaged in a collaboration may change positions, funding periods come to a close, or the initial environmental or socio-economic state evolves, all of which make building and continuing long-term commitments challenging.

Power imbalances among stakeholders at the governmental and non-governmental level are also a challenge for collaborative efforts within marine regions. In some contexts, regional instruments are considered weak within national systems, while other bodies, such as funding donors, can be overpowering by imposing stringent conditions or processes that potentially instrumentalise partners. Such asymmetries vary across the

regional and national level as some stakeholders lack capacity, status, or resources to participate on equal footing more than other stakeholders, resulting in some collaborative processes (such as negotiations or cooperations) in marine regions to be skewed toward the stakeholders with more power and resources. This is further compounded when certain regions have larger and more diffuse institutional structures which put them at a disadvantage compared to regions with more cohesive and stronger economic bodies. However, one interviewee stated that representing a region with fewer resources and therefore fewer specialists requires the representative to attend meetings or negotiations across a variety of topics and sectors, providing them with a more comprehensive understanding compared to specialists that remain in their thematic silo as there are enough human resources to cover each discipline.

Interviewees also noted that there is often a lack of co-design, co-production, and co-delivery from the onset of the collaborative process – from problem identification, design of the response, to implementation of appropriate measures. When such processes do not properly involve the appropriate key stakeholders from the beginning, such as those most affected or vulnerable (e.g., local communities, minorities, or poor communities) or sectors with considerable power leverage (e.g., private industry), it can result in token involvement and unfavourable conditions, further deepening power imbalances. Furthermore, interviewees stated that this results in under or misrepresentation of key stakeholders especially if they lack

resources or institutional infrastructure to engage in or attend dialogue processes where collaborations and decision-making takes place. Histories of token engagement where stakeholder perspectives are only partially acknowledged, or not at all, further manifest deep-rooted challenges of trust. Given the vastness of some marine regions, simply getting the right people in the right place is a challenge for underrepresented and under-resourced stakeholders groups.

Interviewees were emphatic that the acquisition of technical knowledge about the environment was considered a central contribution to dialogue processes, particularly for establishing common targets, criteria and standards (e.g., combatting marine pollution in a marine region). A common challenge is the inaccessibility of the technical language used during international multi-stakeholder collaborative processes which may undermine meaningful engagement. Some stakeholders may not have the expertise or resources to engage in technical or political discussions, such as those commonly led by formal political delegations in advance of negotiations, and their perspectives are consequently not accounted for. Interviewees also stated that capacity building especially regarding technical knowledge is distributed unevenly among stakeholders and nations.

Complex socio-economic and political structures within and across marine regions make it challenging to decide which targets to prioritise, especially in establishing targets that all regional instruments and national governments can realistically commit to. This is especially the case when political dynamics and manoeuvrability are stringent or when resources and capacity limit their ability to implement measures. This is further compounded by uncompromising political positioning; however, interviewees stated that multi-stakeholder dialogue and cooperation can provide a better understanding of what a marine region can deliver collectively, by taking into account the heterogeneous socio-economic, cultural, political and geographical characteristics, and implementing more realistic policy instruments through meaningful incremental progress.

## Principles to Overcoming Challenges of Implementing Collaborative Processes in Marine Regions

Key aspects raised during the interviews to overcoming common challenges of multi-stakeholder dialogue processes in marine regions identified above, include: contextualisation, common goal orientation, inclusivity, trust building, and interactive continuity. These five broad variables (see **Figure 1**, middle upper box) show overlap, and are not independent of each other but rather interlinked. Given the highly context specific nature and non-linear, complex character of collaborations, these variables are regarded as a generalisation and simplification of the process. However, the following section explores each variable in more detail.

### Contextualisation

Interviewees noted that collaborative processes should be situated according to associated confines and opportunities of the highly contextual social, economic, and ecological characteristics of a

marine region. Contextualisation can occur at the local, regional, and global level, with the understanding that it pertains to a set of defined issues (Norström et al., 2020). Positioning a cross-sectoral multi-stakeholder dialogue process involves understanding how challenges have occurred or persisted, and how having multi-stakeholder cross-sectoral dialogue is likely to influence efforts and offer pathways to address challenges. Collaborative efforts should from the onset raise appropriate questions, for example: what are the critical current conditions that may be inhibiting collaboration and what are the entry points or policy windows of opportunity to overcome such challenges? Who are the key players and affected stakeholders and where do power imbalances occur? How effective are current collaborative processes in utilising knowledge *within* rather than *for* processes? Ambitious thinking is needed to identify ways of bridging collaboration gaps and to develop formal and informal collaborative structures for policy integration.

Multi-stakeholder engagement processes are considered uncommon in marine regions, also by the interviewees. A fairly straightforward approach to start addressing challenges pertaining to collaborative efforts is by ensuring mechanisms or platforms that facilitate multi-stakeholder dialogue across sectors exist and are valued at the appropriate levels, from national to regional to global level. One interviewee provided an example where national Caribbean governments have been attempting to establish multi-sectoral committees, such as for coastal zone management, with the intention of collaborating on key technical and policy aspects. However, the level of engagement of civil society, NGO's and private sector frequently lacks, also in the example provided. Spaces to have high-quality multi-stakeholder and cross-sectoral exchanges must be available across all marine regions. Such spaces should provide vulnerable and invested stakeholders with opportunities to actively engage, understand, and contribute to emerging decision processes on technical knowledge or policy windows, especially if these can have long-lasting implications for the marine region itself. One interviewee stated that regional mechanisms should enable inclusive, cross-sectoral decision spaces to discuss transboundary issues, such as marine pollution, offshore exploration or biodiversity loss at a technical and policy relevant level. At the regional level, such spaces could be facilitated by existing regional bodies such as the Regional Seas programmes, most of which are supported or coordinated by the United Nations Environment Programme (UNEP), or the Large Marine Ecosystem mechanisms which is supported by the Global Environment Facility (GEF). However, it should be acknowledged that regional ocean governance mechanisms themselves raise concerns of coordination and efficiency (Billé et al., 2017). Interviewees stated that challenges of socio-economic disparities, power relationships, and resource imbalances need to be addressed from the on-set of a collaborative effort to create more even footing.

### Common Goal Orientation

Pathways to address ocean sustainability challenges require collective understanding, meaningful goal-orientated thinking, and integrated approaches to cooperation. Interviewees acknowledge that high-quality collaborative efforts orient around

a common mind-frame and vision, mutual understanding and interests, and set of strategic objectives which take different perspectives of key players into account that are also acknowledged by all other stakeholders involved. This is especially important for a long-term trusting and working relationship, and to find the necessary compromises among stakeholder groups. A collective understanding and vision necessitates a high degree of ownership and responsibility of the process, especially given the largely informal and voluntary nature of collaborative processes. Several interviewees stated that the incentives to cooperate with recalcitrant stakeholder groups are low and that they see greater value and effectiveness in finding allies with common visions, mutual understandings, and shared intrinsic responsibility. However, when decision-making processes are applied with a collective and goal-orientated approach that is transparent and informal, or at minimum cognisant of political dynamics, even stakeholders with more stringent positions have shown political manoeuvrability in formally supporting marine conservation measures.

Interdependencies and interconnectedness between marine regions were highlighted by interviewees to support the articulation of co-developed meaningful goals through the identification of commonalities. However, it should be ensured that the co-produced knowledge feeds into formal governance arrangements or processes held by other sectors. One interviewee suggested that to increase engagement with private sector stakeholders, generated outputs could for example be disseminated at platforms where the private sector is highly engaged, such as the World Economic Forum.

### Trust Building

Trust building processes are an integral underlying condition and driver for successful cross-sectoral and multi-stakeholder dialogue processes in marine regions. As stated by the interviewees, physical manifestations of trust are usually documented through agreements such as *memoranda of understanding*, but building meaningful trust is a long-term process. It requires human and financial resources to provide continuous, long term commitment for sustainable cooperation between stakeholders. One interviewee stated that when there is a pre-history of antagonism from stakeholders and sectors, simply building trust and receiving informal commitment from such stakeholders can be the most prominent success of a collaborative effort and is sometimes the main objective of facilitation. Collaborative strategies should from the onset budget for the human, financial, and time resources required to build effective and long-term perspective and commitment, and to achieve common goals.

Ocean sustainability includes the perspective of marine conservation and protection (e.g., through marine protected areas or no-take-zones), but also of sustainable use (e.g., by fisheries or tourism). Divergent perspectives require multiple actors with diverse aims and conflicting interests to collaborate and can be viewed as collective action dilemmas (Bowen et al., 2017). Addressing collective action in marine regions requires

trust, enabled by inclusive decision spaces for stakeholders to interact across multiple sectors, levels, and scales, such as through participatory approaches and tools. This can include the engagement of sectors in integrated coastal management or marine spatial planning, and although these tools are not novel, interviewees stated that not all sectors in marine regions are familiar with them and can still be a powerful facilitation tool to increase awareness of other stakeholder perspectives, build trust, and in finding compromise.

### Inclusivity

Collaborative spaces should be inclusive, explicitly acknowledging the diversity of knowledge and applying this knowledge not for, but within collaborative processes. Inclusiveness, empowerment, and representation of weaker or marginalised stakeholder groups require a commitment to a positive strategy from the collaborative process. Power and resource imbalances must be recognised, not just pertaining to human resources but time and financial sustainability, as these are ultimately systemic within and across marine regions, in vertical and horizontal governance structures. Collaborative strategies should also consider power and resource imbalances in their effect on stakeholder abilities to develop long-term trust, shared understandings, and common goals. Conveners of inclusive dialogue spaces should identify and map stakeholders in the region with impartiality and involve stakeholder perspectives through culturally appropriate participatory methods to achieve their full, frequent, and active engagement, and facilitate ownership of the process. Applying these approaches from the onset of the project and allowing time for concerns to be understood and addressed have been catalytic for high-quality inclusive dialogue processes.

Given the lack of collaborative spaces and lack of understanding and preparedness of stakeholders to engage in such processes, these spaces should be made transparent and accessible. Stakeholders which are invested or affected by the decisions should have a basic understanding of what collaborative processes entail, and the implications it can have for them. Capacity development could enable this, building up the stakeholders understanding of the process and language used in collaborative processes, thereby making such processes more transparent and accessible for stakeholders.

Coherence among stakeholders can also be achieved through co-dependency – as the actions of one actor impacts actions, successes, or failures of others. However, co-dependency can also lead to increased competition for resources as stated by one interviewee, can reinforce mistrust and exclusion of stakeholder groups. It was emphasised by an interviewee that the SDGs are vastly accepted by most stakeholders in marine regions and can provide a common overarching framework for stakeholders to align interests and possibly also circumventing the otherwise high degree of technical and political efforts required to build and establish bilateral agreements, targets, and assessment criteria. However, some interviewees pointed out that the SDGs and other formal goals or processes are not tangible enough for the national level of implementation, further resulting in coordination issues and political challenges.

## Interactive Continuity

Productive collaborative processes in marine regions were characterised by interviewees as processes with high engagement and interaction (i.e., high levels of two-way engagement), and continuous (or frequent) learnings from each other with commitment to the process. This is especially important to acknowledge in marine regions with vast geographies and resource allocations (e.g., in the Pacific). Strengthening or improving the practice of interactive continuity within collaborative processes also requires sound evaluation and better monitoring of dialogue processes through pre-determined and co-developed metrics to assess their implementation. This also implies that resources should be budgeted and allocated to enable monitoring and evaluation mechanisms. The complex and iterative nature of collaborative dialogue spaces necessitates evaluation processes that can capture the complexities associated with marine regions and let conveners observe emergent successes, lessons-learned, and outcomes.

Continuity of the collaborative process can be enabled by ensuring financial sustainability, especially as this is often the limiting factor driving time constraints and ultimately long-term commitment challenges in marine regions. Meaningful engagement by funding bodies should be improved and approaches such as budget tracking (identifying where financial resources are flowing to or away and which agencies have provided what support) allows national authorities to understand financial priorities and improve capacity gaps in marine regions. It also allows the national and regional level to increase ownership and targeting of resources, which can be significant for marine regions where development and investments are funded by external states which can result in further power imbalances.

## Experiences of the Marine Regions Forum 2019 — A Case Study of a Cross-Sectoral Multi-Stakeholder Dialogue Platform

In this section, the Marine Regions Forum is reflected upon to illustrate both the strengths and challenges of genuine efforts to cultivate collective action through informal dialogue across sectors and stakeholder groups. When asked about their experiences and perspectives of the Marine Regions Forum 2019 (Institute for Advanced Sustainability Studies et al., 2020; Neumann et al., 2021), the first international multi-stakeholder meeting held under this initiative, interviewees indicated that the informal networking with actors from other regions, sectors, and stakeholder groups was a core significance of attending the Forum (see **Figure 1**, middle lower box), especially as these types of interactions are uncommon in marine regions and would usually require financial and time resources to establish and ultimately sustain.

More specifically, interviewees stated that the Forum facilitated dialogue and engagement opportunities for stakeholders across sectors and interest groups that usually wouldn't interact, sharing of lessons learned, and identifying possible synergies between their practices. The multi-stakeholder cross-sectoral nature of the Forum provided participants with

an increased sense of awareness, trust, and appreciation of common or divergent interests as well as underlining the needs of other stakeholder groups. According to the interviews, the informal nature of the Forum also led to actors from opposing sectors and interest groups to attend working groups together, encouraging openness to other topics and adapting their interests or priorities to new issues when both parties formulated respective interests. For instance, participants establishing informal, cross-sectoral dialogue (e.g., nature conservation NGOs interacting informally with a Regional Fisheries Body) and both attending alternative thematic sessions (e.g., on Deep Seabed Mining) increased the chances of generating new cross-sectoral knowledge and cooperation on themes that are currently not within the scope of the parties. This indicates a fostering of cross-sectoral, joint learning processes among the participants.

The interviewees showed that the informality of the dialogue processes at the Forum led to a number of highly practical discussions between actors from different regions and sectors on how these actors could support, partner, or cooperate each other on cross-regional and cross-sectoral topics that interested both parties. It also led to a range of other outcomes, such as the creation of new partnerships and funding. A concrete example is the grant awarded by the Western Indian Ocean Marine Science Association (WIOMSA) to the Seychelles' Conservation and Climate Adaptation Trust (SeyCCAT), for which connections were made in the follow-up of the 2019 Forum where representatives of both parties had met and SeyCCAT presented during the plenum. The grant allows SeyCCAT to develop knowledge management tools and to share its experience, lessons learned and projects to other countries of the Western Indian Ocean (WIO) region.

Interviewees also stated that at an intrinsic level, the Forum provided them with greater conviction of the regional level, increased awareness of inclusive decision spaces and how to apply their knowledge, as well as improving their own knowledge gaps on interregional processes relevant to their work. Gaining perspectives from a diversity of stakeholders further shaped current research ideas and ocean management practices toward a different school of thinking through the sharing of lessons-learned and successful or unsuccessful approaches to ocean sustainability.

Critical reflections by interviewees revealed where and how the collaborative strategy of the Forum could be further improved. Feedback indicated that the informalities contributed to encouraging interactions between participants, and although the more formal contributions from high-level speakers during plenum were recognised as important to create buy-in, participants found it drew attention and created a more formal setting. Some interviewees perceived a higher engagement with participants they were familiar with or attended working groups within their discipline rather than branching out to other thematic areas. However, it must be recognised that interactions with familiar allies and topics are also highly beneficial for already established partnerships. The value lies within deepening trust, ensuring commitments, and more

effective communication, coordination, and cooperation through face-to-face dialogue.

## DISCUSSION

The key motivation behind this study is to provide a better understanding of the challenges and opportunities of collaborative processes in and across marine regions as well as comprehend how informal, inclusive spaces for dialogue and knowledge exchange, specifically the Marine Regions Forum, can facilitate transformation toward integrated ocean governance practices. Creating inclusive dialogue spaces to enable collective action is considered a major governance challenge to successfully implementing SDGs (Bowen et al., 2017). The central findings of this paper offer insight into bridging the gap of current collaborative efforts in marine regions to strengthen regional ocean governance.

**Figure 1** illustrates the overall findings of this paper on the challenges and opportunities for cross-sectoral multi-stakeholder collaborations among marine regions, and is based on the contingency theory by Ansell and Gash (2007), i.e., within the analytical framework identified from the literature (see section “Materials and Methods”). The model (**Figure 1**) has four broad variables as explained below, including critical common starting conditions, principles to overcoming challenges, facilitative leadership i.e., the Marine Regions Forum, as case study example for a collaborative process, and outcomes of such processes. These variables are not independent of each other, but are rather connected and influence each other. The critical common starting conditions are the entrenched or systemic challenges faced by marine regions which typically constrain but also provide reason for collaboration. At the heart of the model lie the principles to overcome such challenges. They are presented cyclically as they are interconnected, interdependent and non-linear in nature. Principles to overcoming barriers include common goal orientation, inclusivity, trust building, interactive continuity, and contextualisation. The Marine Regions Forum positions itself as a variable of facilitative leadership, i.e., cultivating essential knowledge integration by creating an inclusive and informal dialogue space for stakeholder interaction across multiple sectors and scales. These variables contribute to supporting formal, global ocean governance processes, such as the implementation of SDG 14 and other ocean related SDGs of the 2030 Agenda (see **Figure 1**, right box).

Although marine conservation efforts, management, and implementation of measures occur at the national or local level, regional dialogue is in a unique position to coordinate knowledge integration (Tutangata and Power, 2002; Van Tatenhove, 2011) and ultimately cultivate the process of implementing common agreed-upon global frameworks into action on the ground such as in the context of the 2030 Agenda, the Post-2020 Global Biodiversity Framework currently prepared under the Convention on Biological Diversity, or discussions addressing the ocean-climate nexus within the United Nations Framework Convention on Climate Change (UNFCCC). Regional dialogue platforms can strengthen the recognition of the need for common

(regional) goals and collective harmonised action as well as coherence of indicators used to measure or monitor their progress. In this context, regional deliberations need to be cohesive and innovative, capable of providing guidance and identifying synergies and trade-offs between interlinked goals (Bowen et al., 2017). Such dialogue platforms can also be used as a tool to generate greater commitment and accountability in marine regions. Especially as many global policy processes are voluntary and no formal mechanisms or sanctions are in position to ensure the achievement of set targets (Bowen et al., 2017).

Ensuring the transformative potential of collaborative spaces, such as the Marine Regions Forum, lies within the co-creative and transdisciplinary approach of these which allows the cultivation of opportunities for joint-learning and knowledge integration as a matter of practice. Facilitating multi-stakeholder and cross-sectoral interactions leads to new exchanges, perspectives, arrangements, and cooperation that allow for working fundamentally differently at the regional level. Further, participants of collaborative spaces gain a better understanding and orientation of collaborative landscapes available and how to engage in them, especially as such efforts and practices are still uncommon. In the end, it is individual responsibility and collective accountability that will facilitate the process for knowledge integration into work practices. This paper also supports the demand to incorporate reflective processes, as performed on the Marine Regions Forum, regarding lessons learned of knowledge integration within practices, to be able to assess, learn, and improve the practices (Le Tissier and Hills, 2010; Norström et al., 2020; Schmidt et al., 2020).

Based on the interview data, the approach to regional learning adopted by the Marine Regions Forum had an acknowledgeable influence on interviewees in three interlinked areas, which potentially extend to the other attendees of the Forum. Firstly, it increased the attendee's conviction of the role of the regional level, awareness of the current lack of regional knowledge integration, and the need for policy frameworks that explicitly include regional actors. Attendees also gained an insight into regional contextualisation of global frameworks and how the regional level can facilitate processes from the national to global level, including which regional actors and processes are most relevant and how to engage with these. Secondly, attendees gained an understanding of the opportunities for multi-stakeholder integration within regional practices across sectors that complement, rather than replace, existing governance frameworks. Third, the Forum fostered a joint-learning experience for the integration of knowledge across multiple sectors and scales as a matter of practice by creating an inclusive and informal dialogue space.

Possible limitations to this paper due to the fact that co-organisers of the Marine Regions Forum conducted the study and approached interviewees should be acknowledged. For example, the interview responses could be expected to be more critical had they been conducted by a third-party. However, before and during the interview process, respondents were encouraged to reflect critically which they acknowledged and were responsive toward by providing in-depth accounts of their experiences as participants. Moreover, the purpose of the research is foremost to provide a self-reflective account of the newly established

Forum as co-organisers and to better understand collaborative processes in and among marine regions which have so far been subject to limited assessments through self-reflexivity, although this is regarded as an integral aspect to transdisciplinary research approaches (Rosendahl et al., 2015; Schmidt et al., 2020). The paper seeks to contribute to the assessment and learnings from such collaborative processes in marine regions and allow relevant stakeholders to address the challenges and also engage in self-assessment to improve the practice.

In summary, informal collaborative dialogue spaces detached from institutional settings, such as the Marine Regions Forum, have the potential to cultivate communities for sharing of lessons learned and joint-approaches to overcoming common challenges, thereby supporting transformations toward sustainability. The Forum applies transdisciplinary learning and multi-stakeholder collaboration as a matter of practice and provides regional contextualisation of global frameworks in support of implementing of the 2030 Agenda. As depicted in **Figure 1**, the Forum is positioned within the collaborative process landscape and contributes to both informal and formal processes, consolidating discussions around regional approaches, which are usually highly contextualised, and facilitated a common understanding of interregional challenges and opportunities. It not only placed emphasis on regional cooperation but also achieved to value actors irrespective of the inherent power differences among different types of regional mechanisms or arrangements sharing the space. This further encouraged innovative thinking on how regional mechanisms can cooperate and collaborate to facilitate the implementation of global goals, which in turn reduced the usual competition between the regional actors or sectoral arrangements and placed them on equal footing to each other.

## CONCLUSION

This study sets out to investigate the challenges and opportunities of current collaborative processes in marine regions and provides critical reflections of the Marine Regions Forum – a newly established inclusive dialogue and exchange platform that brings actors together across multiple stakeholder groups, sectors, and marine regions in a genuine effort to enable the transformative change for the sustainable use and conservation of marine environments. The findings have both scholarly relevance and practice-based significance by providing a better understanding of the opportunities and underlying challenges of current collaborative efforts in marine regions and possible pathways to address these. Further, it is exemplified how informal collaborative processes, such as the Marine Regions Forum, can facilitate the transformation toward sustainable ocean-related governance practices and support global goals and targets through cultivating essential knowledge integration in marine regions by creating an inclusive dialogue spaces and opportunity for stakeholder engagement across multiple sectors and scales. To further support collaborative processes in marine regions, which are regarded as uncommon, and to advance the work of the Marine Regions Forum, the project will be taken into

a second phase. Building on the outcomes of this study and lessons learned from the first Forum, the follow-up project aims to be more regionally focussed, by engaging with a specific marine region to further support transformative ocean action toward the conservation and sustainable use of marine and coastal ecosystems.

Transforming global goals and targets such as the SDGs into action on the ground, especially in light of complex social-ecological issue settings such as “the ocean,” requires a systemic approach to capitalise on synergies and avoid trade-offs, rather than focussing on single goals and targets (Griggs et al., 2017; Nilsson et al., 2018). The delivery of such systemic approaches is hampered by the current institutional and legal fragmentation in ocean governance, but also by other problems such as underdeveloped cultures of collaboration and coordination. Regionally coordinated approaches will be required to achieve advances in the marine environment given these challenges and the accelerating pace of ocean decline. To transcend the prevailing sectoral divides, collaborative approaches are needed that seek the delivery of joint policy development and implementation, bringing together all relevant actors for co-design and co-delivery. In the context of the ocean, the regional level is well suited to facilitate and coordinate multi-stakeholder collaborations across sectors and cultivate knowledge integration to foster the process of implementing global frameworks into action on the ground. Given the complexity of transformation processes toward ocean sustainability, collaborative stakeholder dialogues are suitable to provide the transdisciplinary and knowledge-based guidance needed for use within practices. Synergies and trade-offs amongst regional interests should be identified to ensure effective and fair outcomes such that the lessons learned are relevant and valuable to the other marine regions. By complementing existing processes, facilitating multi-stakeholder exchanges across sectors, and disseminating emerging recommendations to the formal policy processes, informal dialogue spaces for marine regions have the potential to make real progress in ocean governance and sustainability transformations.

The decisions taken and implemented now and in the next decade will be decisive for the future of the ocean. The Marine Regions Forum was set up as an inclusive dialogue space for joint-learning and to support current collaborative efforts within and across marine regions, and by that strengthen regional ocean governance. It has demonstrated that such regional stakeholder processes have the potential to foster facilitative leadership and encourage multi-stakeholder knowledge integration across sectors. Collaborative efforts contribute to supporting formal ocean governance processes at the regional and global level, such as the implementation of SDG 14 and other ocean related SDGs that aim to achieve sustainable use and conservation of the ocean and its resources while delivering a more sustainable future for all.

## DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

## AUTHOR CONTRIBUTIONS

LW, BN, and SU contributed to the conception or design of the work and jointly conceptualised the manuscript. LW organised and conducted the collection and analysis of the interview data for this work and wrote the first draft. BN and SU contributed to sections of the manuscript and revised it critically together with LW, JR, and AM. All authors contributed to manuscript revision, read, and approved the submitted version.

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## SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fmars.2021.645576/full#supplementary-material>

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# The Eastern Tropical Pacific Marine Corridor (CMAR): The Emergence of a Voluntary Regional Cooperation Mechanism for the Conservation and Sustainable Use of Marine Biodiversity Within a Fragmented Regional Ocean Governance Landscape

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The San Jose Declaration formally established the Eastern Tropical Pacific Marine Corridor (CMAR) in 2004, a voluntary regional cooperation mechanism created by the coastal States of Ecuador, Costa Rica, Colombia, and Panama in response to anthropogenic pressures in the Eastern Tropical Pacific, one of the most productive and biodiverse oceans in the world. This article will explain how, in the absence of a coherent, overarching regional ocean governance framework, these four coastal States came together to create a regional cooperation mechanism for the conservation and sustainable use of marine biodiversity in the Eastern Tropical Pacific. The key normative features of CMAR will be examined, as well as legal and governance challenges, such as its non-binding nature, large scale, limited sectoral engagement, and insufficient resources. The analysis will be couched within a discussion of the wider regional ocean governance framework, which remains fragmented, with gaps and overlaps in terms of membership, mandates and geographic coverage. Possibilities for integration, and the potential impact of a new treaty protecting biodiversity beyond national jurisdiction (BBNJ), will also be considered.

**Keywords:** regional cooperation, Eastern Tropical Pacific, marine corridor, MPAs, regional ocean governance, CMAR, BBNJ

## INTRODUCTION

Area-based measures, in particular marine protected areas (MPAs), have emerged in recent decades as a widely accepted policy and legal instrument to provide for the long-term conservation of nature, restore ecosystem resilience<sup>1</sup> and mitigate the damage to marine biodiversity caused by human activities (Laffoley et al., 2019). Networks of MPAs<sup>2</sup> across jurisdictional boundaries are now seen as increasingly necessary due to the interconnectivity of ocean ecosystems (Laffoley et al., 2020, p. 4) and regional cooperation has been deemed essential for their management (Ângelo Guerreiro da Silva et al., 2012, p. 329). The Eastern Tropical Pacific Marine Corridor (CMAR)<sup>3</sup>, established in 2004 by Ecuador, Costa Rica, Colombia and Panama, is regarded as a leading example of regional cooperation for the creation of a transboundary network of MPAs in Latin America (Johnson et al., 2014, p. 80). This article will describe how, in the absence of an external, overarching and coherent regional ocean governance framework, these four coastal States came together, in response to anthropogenic pressures, to create a regional cooperation mechanism for the conservation and sustainable use of marine biodiversity in the Eastern Tropical Pacific. The key normative features of CMAR will be examined, as well as the legal and governance challenges it has faced, such as its non-binding nature, limited sectoral engagement, large scale and insufficient resources. The analysis will be couched within a discussion of the wider regional ocean governance framework, which remains fragmented, with gaps and overlaps in terms of membership, mandates and geographic coverage. Possibilities for integration, and the potential impact of a new treaty protecting biodiversity beyond national jurisdiction (BBNJ), will also be considered.

## EASTERN TROPICAL PACIFIC OCEAN

The Eastern Tropical Pacific Ocean (ETPO) extends from the Gulf of California to the north of Peru, covering 21 million square kilometers, which includes international waters and the national waters of 12 states (Spalding et al., 2007; Martin et al., 2016, p. 3). The ETPO is connected by a series of currents that provide a diverse and changing set of oceanographic conditions throughout the region and high levels of productivity and biodiversity (Fiedler and Lavín, 2017). In recognition of the exceptional levels of biodiversity and extraordinary presence of endemic, native and migratory species, several world-renowned MPAs have been created in the region, including Galapagos (Ecuador), Cocos (Costa Rica), Coiba (Panama), Malpelo and Gorgona (Colombia). All of these MPAs, except for

Gorgona, are World Heritage Sites [United Nations Educational, Scientific and Cultural Organization (UNESCO), 2021], two are Ramsar Sites (Galapagos and Cocos; Ramsar, 2021) and the International Maritime Organization (IMO) has designated Galapagos and Malpelo as Particularly Sensitive Sea Areas (PSSAs) [International Maritime Organization (IMO), 2021].

The ETPO features strong climatic asymmetry across the equator, cool and warm currents meet in what is called the Intertropical Convergence Zone (ITCZ), where the above MPAs are located, resulting in unique oceanographic conditions that affect the distribution of marine species and habitats (Banks and Witman, 2018). The large numbers of migratory species that travel between several of the MPAs, along with the larvae dispersal in the region, clearly demonstrate the ecological connectivity within the region and the importance of protecting it (Hearn et al., 2010; Bessudo et al., 2011; Cortés et al., 2017; Romero-Torres et al., 2018). The region is characterized by its high biological diversity and regional endemism, including some of the last large concentrations of sharks globally and the second most important nesting colony for green sea turtles (Seminoff, 2004; Hearn et al., 2010). The area of the ETPO which is being proposed as a marine corridor (**Figure 1**) has been recognized as an Ecologically and Biologically Significant Area (EBSA) by parties to the Convention on Biological Diversity (CBD, 1992) on the basis that *inter alia* “the geomorphological structures of the area are biologically and ecologically significant and are important for the connectivity of species on their migratory routes and at other times of their life cycles (e.g., mating, birth, feeding). The area plays an important role for populations of hammerhead sharks, humpback whales, leatherback and Ridley turtles, and birds, such as cormorants, boobies and pelicans” (CBD and COP Decision XII 22, 2016, p. 18).

The ETPO is considered one of the most productive oceans in the world with a biological richness that provides significant ecosystem services. For example, commercial fisheries (food production) are valued at approximately \$2 billion per year and other significant economic benefits include carbon storage and tourism (Martin et al., 2016, p. 13). The MPAs in the region are recognized as some of the best recreational diving destinations in the world, thanks to the abundance, biodiversity, and beauty of their marine resources, and are an important economy for many communities along the ETPO. Despite their immense ecological value, marine ecosystems in the ETPO are becoming degraded due to the steady increase of anthropogenic pressures that can in some cases cause significant changes and reorganizations of the structure and function of marine ecosystems (Rocha et al., 2015). Climate change (Castrejón and Charles, 2020), illegal, unreported and unregulated (IUU) fishing (Castro et al., 2020), marine invasions (Carlton et al., 2019), pollution (Alava et al., 2014), increasing tourism, coastal development and population growth (Hastings et al., 2015; Ramirez, 2016) are among the well-documented problems posing a critical, growing threat to livelihoods, ecosystem sustainability and functioning of coastal zones.

Overfishing, in particular, is a significant threat to migratory species in the ETPO. It is generally accepted that overfishing is the principal cause of marine defaunation globally

<sup>1</sup>Ecosystem resilience is “the extent to which ecosystems can absorb recurrent natural and human perturbations and continue to regenerate without slowly degrading or unexpectedly flipping into alternate states” (Hughes et al., 2005, p. 380).

<sup>2</sup>Networks of MPAs have been defined as “a collection of individual MPAs operating cooperatively and synergistically, at various spatial scales, and with a range of protection levels, in order to fulfill ecological aims more effectively and comprehensively than individual sites could alone.” (IUCN World Commission on Protected Areas (IUCN-WCPA), 2008, p. 3).

<sup>3</sup>CMAR is the Spanish acronym for Corredor Marino del Pacifico Este Tropical.



**FIGURE 1 |** Proposed Eastern Tropical Pacific Marine Corridor (CMAR). This map was designed by the MarViva Foundation in 2005 as a tool to visualize the area which could eventually be delimited as the marine corridor. The official geographic delimitation of CMAR remains pending. Available at <http://cmarpacifico.org/web-cmar/quienes-somos/que-es-el-cmar/>.

(Pacoureau et al., 2021) and a main reason for the decline of many migratory marine species in the ETPO (Peñaherrera-Palma et al., 2018, p. 71, 112). As well as intense fishing pressure from national vessels (WildAid, 2010, p. 2; The Economist, 2020; Hearn et al., 2021, p. 8), the high seas areas in this region have been subject to increased fishing effort in recent years by foreign flagged fleets, often loitering adjacent to or entering a marine protected area (Alava and Paladines, 2017; Collins, 2020), a trend which is predicted to worsen in the future. The Intergovernmental Panel on Climate Change (IPCC) has identified the ETPO as an area facing complex fishing governance challenges given that fisheries productivity may be less affected by climate change in certain areas due to the presence of colder oceanic currents (Hearn et al., 2021, p. 10).

Climate change is exacerbating all other challenges facing the region. The ITCZ convergence zone, which shifts latitudinally with climate patterns, makes the marine and coastal ecosystems of the MPAs in the ETPO particularly vulnerable to climate

change impacts. Warming surface waters, particularly during intense El Niño events, result in lower primary production and a general decline in biological activity (Liu et al., 2013). During the past decades, the frequency and severity of El Niño events have increased, and climatic models have shown that this tendency will continue to worsen within the ETP region under current rates of global warming (Liu et al., 2013; Cai et al., 2018).

Weak governance has also been cited as an overarching problem [WildAid, 2010; Corredor Marino del Pacífico Este (CMAR), 2019a, p. 16]. Conservation efforts in the region have struggled due to lack of coordination among governments, civil society and academia, weak management of protected areas, limited capacity for monitoring and enforcement, limited control over the sources of marine pollution, lack of data or lack of access to data, limited public participation, lack of public awareness regarding the value of ecosystem services in the region as well as inadequate resources and funding [Arauz et al., 2017, p. 9; Corredor Marino del Pacífico Este (CMAR), 2019a, p. 16].

The cumulative nature of the above outlined pressures eventually led the governments of Ecuador, Costa Rica, Colombia, and Panama to create a regional cooperation mechanism in order to ensure the sustainability of marine ecosystems in the ETP region.

## EASTERN TROPICAL PACIFIC MARINE CORRIDOR (CMAR)

### Emergence of CMAR

The genesis for CMAR began in 1997 as a cooperation agreement between Costa Rican and Ecuadorian environmental authorities with the goal of improving coordination between Cocos and Galapagos in light of their significant ecological connectivity [Corredor Marino del Pacífico Este (CMAR), 2005, p. 1]. In 2001, a Presidential Declaration was signed between Costa Rica and Ecuador which welcomed a proposal by a group of intergovernmental and non-governmental organizations (NGOs)<sup>4</sup> for the creation of a marine corridor between Cocos and Galapagos. This statement of presidential intent has been cited as the beginning of the official process at governmental level which led to the establishment of CMAR [Corredor Marino del Pacífico Este (CMAR), 2019a, p. 7].

In 2002, during a regional ministerial meeting in Colombia, the initial proposal to create a corridor between Cocos and Galapagos was extended to include the islands of Malpelo, Gorgona, and Coiba on the basis that it made strategic political sense to take a regional approach to environmental management [Corredor Marino del Pacífico Este (CMAR), 2019a, p. 8]. The amplified proposal was then presented at the 2002 World Summit on Sustainable Development in Johannesburg as a strategic alliance between Ecuador, Costa Rica, Colombia, and Panama with the support of intergovernmental organizations and NGOs [Corredor Marino del Pacífico Este (CMAR), 2004, p. 6]<sup>5</sup>.

In 2004, CMAR was formally established by the San Jose Declaration (SJD), a non-binding agreement which sets out the objectives of CMAR and establishes a regional cooperation mechanism for its management. The 2019–2024 Action Plan for CMAR (p. 8) defines it as “a regional initiative for conservation and sustainable use which seeks, via an ecosystem approach, the adequate management of the biodiversity, marine and coastal resources of the Eastern Tropical Pacific, through regional governmental strategies, jointly supported by civil society, non-governmental organizations and international cooperation, with the MPAs of Cocos, Galapagos, Malpelo, Gorgona and Coiba considered core areas.” The Action Plan (p. 9) goes on to outline a vision for CMAR which is the achievement of effective governance and participation at a regional scale for the conservation and sustainable use of ETP biodiversity, with the MPAs as core areas of conservation. In close alignment with its vision is CMAR’s stated objective which is to achieve conservation

and promote sustainable use of biological diversity in the ETP region, based on the interests and priorities of its member States, via the establishment of regional governmental strategies supported by civil society, NGOs and international cooperation [San Jose Declaration (SJD), 2004, p. 3–4; Corredor Marino del Pacífico Este (CMAR), 2019a, p. 9]. The guiding principles of CMAR are equity, sovereignty, precaution, transparency and adaptive management [Corredor Marino del Pacífico Este (CMAR), 2019a, p. 19–20].

### Regional Cooperation Mechanism

In order to achieve its goals, the SJD provides for the establishment of a regional mechanism, made up of political and technical components, which complement each other (**Figure 2**). The political element consists of a Regional Ministerial Committee (RMC) which is made up of the Environment Ministers of each State [San Jose Declaration (SJD), 2004, para. 4a]. This is the main decision-making body of CMAR [Corredor Marino del Pacífico Este (CMAR), 2019a, p. 10]. It issues guidelines and supports the process of implementation politically in accordance with conservation priorities for CMAR, the policies of each participating State and the relevant international framework [San Jose Declaration (SJD), 2004, para. 4a]. The RMC meets once a year [Corredor Marino del Pacífico Este (CMAR), 2004, p. 29] and has a “Pro Tempore” Presidency, which rotates every 3 years between the four participating States [Corredor Marino del Pacífico Este (CMAR), 2019a, p. 10]. The RMC is advised by each State’s Foreign Ministry with respect to matters of international relations between the four States [Corredor Marino del Pacífico Este (CMAR), 2019a, p. 10].

The technical component of CMAR comprises of a Regional Technical Committee (RTC), which is responsible for defining the actions needed to implement CMAR [San Jose Declaration (SJD), 2004, para. 4b]. It acts as the advisory body to the RMC and is made up of a delegate (also known as a focal point) of each State’s Ministry of Environment [Corredor Marino del Pacífico Este (CMAR), 2019a, p. 10], who is often a Director of one of the core MPAs. Currently, the delegates are the Vice Minister for Water and Seas, Costa Rica, the Director of the Galapagos National Park, Ecuador, the Director of National Natural Parks, Colombia, and the Director of Coasts and Seas, Panama. The RTC meets twice a year; in terms of decision making, each State has one vote, yet all decisions are adopted by consensus [Corredor Marino del Pacífico Este (CMAR), 2004, p. 30]. It is supported by a “Pro-Tempore” Secretariat, which rotates between States in conjunction with the Presidency [Corredor Marino del Pacífico Este (CMAR), 2019a, p. 10]. The Secretariat is responsible for carrying out CMAR management actions and coordinating cooperation between the four participating States and any involved international organizations and NGOs [Corredor Marino del Pacífico Este (CMAR), 2019a, p. 10].

The structure of CMAR also provides for Regional Working Groups, which are made up of experts representing key thematic areas identified as priorities for the conservation of the biodiversity of the region: Tourism, MPAs, Science, Fisheries and Communications

<sup>4</sup>United Nations Environment Program (UNEP), the International Union for the Conservation of Nature (IUCN), and Conservation International (CI).

<sup>5</sup>United Nations Educational, Scientific and Cultural Organization (UNESCO), United Nations Development Program (UNDP), IUCN, and CI.

[Corredor Marino del Pacífico Este (CMAR), 2019a, p. 10]. These groups provide input and advice to CMAR and are made up of representatives from government institutions, NGOs, research and academia. Each group is led by a coordinator and works with the Secretariat to push forward technical matters such as the creation and joint management of projects for CMAR [Corredor Marino del Pacífico Este (CMAR), 2019a, p. 10]<sup>6</sup>.

At the national level, multisectoral and interinstitutional National Commissions are provided for in order to deal with any CMAR related matters in a national context, which are to be convened by the focal point in each State [Corredor Marino del Pacífico Este (CMAR), 2019a, p. 10]. Each State is responsible for forming its own National Commission and establishing its functions and rules. The purpose of the National Commissions is to ensure the involvement of different sectors, for example, fisheries institutes, tourism authorities, government ministries dealing with the environment and agriculture, biodiversity, forestry, ecosystems, water resources, and the Naval and Defense forces [Corredor Marino del Pacífico Este (CMAR), 2019a, p. 10]. To date, only Colombia has officially established a National Commission, which has been in operation since 2012 [Corredor Marino del Pacífico Este (CMAR), 2019a, p. 10]. Costa Rica and Panama are currently in the process of forming their National Commissions by identifying appropriate actors and deciding whether there is already an established organ which could assume this function. Ecuador has not yet begun a process.

## Governance Challenges

CMAR is a voluntary, political initiative between four States and therefore not legally binding [Corredor Marino del Pacífico Este (CMAR), 2004, p. 29]. This type of less formal approach is sometimes viewed as a positive at the regional level as it can secure political engagement more readily and may result in less opposition from industry. As a political initiative, it offers the possibility to harmonize national positions in the region with respect to marine environmental protection. On the other hand, the lack of a legally binding element has significant implications for implementation and enforcement. It also implies no devoted funding mechanism, which impacts on critical issues such as institutional infrastructure and capacity for monitoring and enforcement.

At a 2004 RMC meeting, it was deemed essential that the Secretariat have the physical infrastructure, and human and financial resources necessary to effectively carry out its functions. Yet, it was concurrently decided that the Secretariat would be funded by support from other interested governments, international organizations and NGOs [Corredor Marino del Pacífico Este (CMAR), 2004, p. 30], creating circumstances which have not been conducive to a stable and secure funding stream. The Secretariat does not yet have a permanent physical infrastructure and currently rotates between each State every

3 years, in conjunction with the Presidency. The State that exercises the Presidency and the Secretariat (both roles rotate jointly) currently covers the associated expenses of operating the Secretariat with funds that are provided by that government's budget or via international cooperation. Financial sustainability is a chief concern in CMAR's current Action Plan. Coordination between four countries and multiple organizations is resource intensive in addition to the many legal and institutional challenges involved in managing shared biological resources [Corredor Marino del Pacífico Este (CMAR), 2019a, p. 21]. To this end, the Action Plan for 2019–2024 recommends evaluating the possibilities for transforming CMAR into a legally binding agreement, which it asserts would revitalize CMAR politically as well as increase visibility internationally, thus leading to more opportunities for long term sustainable funding (p. 45). During the RMC meeting of August 2020, the Technical Secretariat was instructed to elaborate a draft proposal for such an agreement between the four States, which is due to be presented during the latter half of 2021.

Another limiting factor is that CMAR was not framed in a multi-sectoral manner from the outset, resulting in resistance from the fisheries sector (Bensted-Smith and Kirkman, 2010, p. 98), who were concerned that the marine corridor sought absolute protection of marine resources [Corredor Marino del Pacífico Este (CMAR), 2019b, p. 6]. Although there are strong commercial fishing links between the four CMAR States, there is not a history of collaboration on issues relating to environmental management (WildAid, 2010, p. 2). In order to create a level of sectoral engagement, Regional Working Groups and National Commissions are provided for within the structure of CMAR, as described above, whose goal is to incorporate the viewpoints of different groups who carry out activities in the ETP. However, the private sector is notably absent from both. The Action Plan for 2019–2024 acknowledges the important role of the thematic working groups but notes that interaction with the fishing sector has been limited, pointing to the restricted capacity of CMAR to take political or institutional decisions affecting this sector (pp. 11–12). In terms of concrete actions with regard to fisheries, CMAR restricts itself to producing a report with a set of recommendations on better fishing practices in the region [Corredor Marino del Pacífico Este (CMAR), 2019a, p. 29, 43]. However, the tourism sector has been more receptive to engagement with CMAR.

The scale of a project like CMAR involving transboundary marine management across four jurisdictions is a significant challenge and progress on formalizing the initiative has been slow to date as a result. Such an undertaking is without precedent in the region and execution is naturally complex due to the number of different actors involved (technical, political, and governmental/non-governmental), the limited resources available and the large amount of biodiversity and oceanographic area to be covered [Corredor Marino del Pacífico Este (CMAR), 2005, p. 2]. CMAR has not yet been officially delimited from a geographical or jurisdictional perspective [Corredor Marino del Pacífico Este (CMAR), 2019a, p. 11]. Based on current applicable legal frameworks, it is likely that the eventual delimitation of CMAR will only cover an area within the Exclusive Economic

<sup>6</sup>Examples of recent projects within the Science and MPA Working Groups include addressing plastic pollution in the ETP; monitoring of pelagic migratory species and marine invasive species in the ETP and working toward standardizing methodologies.

Zones (EEZs) of the respective member States, not the high seas pocket included in the proposed map (**Figure 1**)<sup>7</sup>. This is due to the absence of a regional or internationally agreed legal framework with the power to establish protected areas on the high seas. Given that the high seas do not fall under the jurisdiction of any single State, MPAs can only be designated there under an appropriate authority or instrument with a mandate (UNEP-WCMC, 2017, p. 23). Efforts have been ongoing since 2018 to create a new international legal framework for the establishment of MPAs in areas beyond national jurisdiction (ABNJ), as part of the BBNJ negotiations [United Nations General Assembly (UNGA), 2017]. How this may impact existing governance mechanisms in the ETP region will be discussed in the next section.

CMAR also needs to be integrated into the political, legal and economic systems of four different member States, each with its own distinct culture [Corredor Marino del Pacífico Este (CMAR), 2019a, p. 13]. Given that all CMAR member States have already faced significant challenges in effectively managing MPAs within their national jurisdictions from a law enforcement perspective (WildAid, 2010, p. 72; Cremers et al., 2020, p. 11), it remains to be seen how this can be effectively done on a larger scale. MPA managers within CMAR territory have previously identified several limiting factors affecting their work, including overlapping or interfering jurisdiction between authorities, lack of coordination between authorities, lack of resources, lack of political will regarding conservation, and institutional weakness in the government environmental sector (WildAid, 2010, p. 4). These challenges continue to remain relevant today (Cremers et al., 2020, p. 11). CMAR offers an opportunity to redress many of these issues, but only if adequately equipped to do so. The Action Plan for 2019–2024 has acknowledged the need to strengthen the governance of CMAR as a priority action (pp. 20–24). Specific actions listed in order to achieve this include identifying mechanisms for long term financial sustainability, establishing the envisaged National Commissions in each CMAR member State and strengthening the advisory and technical execution role of the Regional Working Groups (p. 23). In order to improve regional coordination in a cost-effective manner, the Action Plan proposes implementing a digital platform for communication between the four States (p. 24). Despite the ambitious scale of CMAR as currently proposed, the 2019–2024 Action Plan recommends considering possibilities for expanding the initiative to include other MPAs and countries in the region [Corredor Marino del Pacífico Este (CMAR), 2019a, p. 46].

## REGIONAL OCEAN GOVERNANCE IN THE EASTERN TROPICAL PACIFIC

### A Picture of Fragmentation

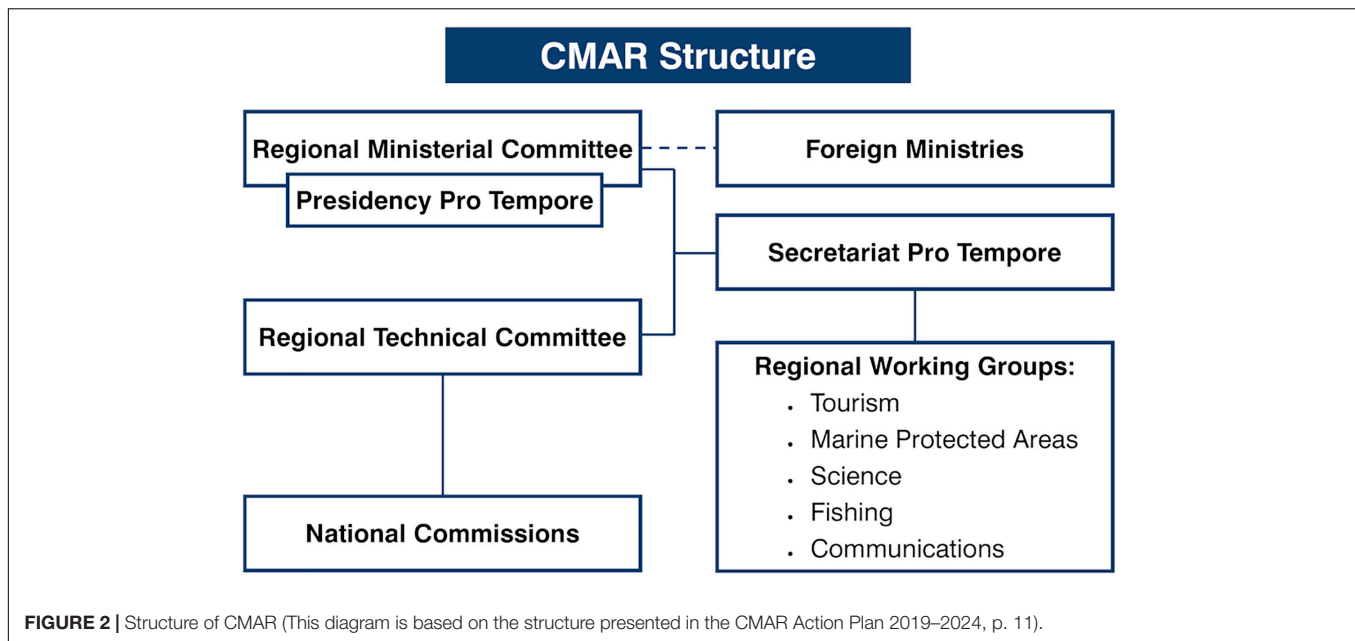
One of CMAR's original objectives was to establish an adequate regional framework to facilitate the development

and management of the marine corridor, in a manner compatible with the politics and legislation of the four member States and any applicable international conventions and agreements [Corredor Marino del Pacífico Este (CMAR), 2005, p. 4]. CMAR cites several international agreements as legal justification for its creation [Corredor Marino del Pacífico Este (CMAR), 2004, pp. 9–12]. Specific reference is made to the [International Convention for the Regulation of Whaling (ICRW), 1946], the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention, 1971), the Convention concerning the Protection of the World Cultural and Natural Heritage (United Nations Educational, Scientific and Cultural Organization (UNESCO), 1972), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, 1973), the United Nations Law of the Sea Convention (UNCLOS), 1982 and the Convention on Biological Diversity (CBD, 1992). Regional agreements such as the Inter-American Convention for the Protection and Conservation of Sea Turtles, 1996 and the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere, 1942 are also mentioned.

However, a comprehensive, overarching regional ocean governance (ROG) framework is lacking in the ETP. In their global study of ROG arrangements, Mahon and Fanning identified ten different arrangements for the ETP region but no integration mechanism (Mahon and Fanning, 2019a, p. 6; Supplementary Material, p. 4). From a global perspective, there are three main ways that ROG is carried out: via the Regional Seas Programs (RSP), Regional Fishery Bodies (RFB), and Large Marine Ecosystem (LME) mechanisms (Rochette et al., 2015, p. 9). These global approaches are complemented by other regional initiatives, such as those taken by political and economic organizations (e.g., the European Union), leaders and heads of State, NGOs, coastal communities and individuals (Johnson et al., 2014, p. 75; Wright et al., 2017, p. 13).

The RSP was established in 1974 by the United Nations Environment Program (UNEP) to serve as a regional mechanism for the conservation of marine and coastal environments [United Nations Environment Programme (UNEP), 2017, p. 1]. It has been credited with pioneering the regional approach to the management of the marine environment (Johnson et al., 2014, p. 76) and now covers 18 marine and coastal regions worldwide, with more than 146 countries participating in the program [United Nations Environment Programme (UNEP), 2021a]. The mandates of the different RSPs have evolved over time from an initial focus on pollution to encompass biodiversity conservation more broadly, with an emphasis on MPA creation [United Nations Environment Programme (UNEP), 2016, p. 25]. Some regions also include the objective of achieving sustainable development, as can be seen below in the RSP for the North East Pacific. RSPs are usually implemented through strategic action plans (Ehler, 2006, p. 26), which outline the environmental problems in the region and the actions necessary to address them (Oral, 2015, p. 347). Many regions also adopt legally binding instruments and framework conventions to underpin the action plan [United Nations Environment Programme (UNEP), 2016, p. 3].

<sup>7</sup>In this context, it should be noted that Ecuador has declared its right to extend its continental shelf to 350 nm measured from the baselines of the Galapagos Archipelago. <https://www.cancilleria.gob.ec/en/ecuador-seeks-to-expand-its-continental-shelf-beyond-200-nautical-miles/>.



There is no functioning RSP for the ETP region. The Antigua Convention for the North East Pacific (Antigua Convention, 2002) was signed by Panama, Costa Rica and Colombia, as well as several other Central American States in 2002<sup>8</sup>, however, it has not yet entered into force [United Nations Environment Programme (UNEP), 2021b]<sup>9</sup>. The principal purpose of the Convention is to establish a regional cooperation framework to encourage and facilitate the sustainable development of marine and coastal resources of the North East Pacific (Article 1, Antigua Convention). State parties approved an Action Plan in 2002 detailing how they planned to improve the environment of the North-East Pacific [Plan of Action for the Protection and Sustainable Development of the Marine and Coastal Areas of the North East Pacific United Nations Environment Programme (UNEP), 2002], however, it is not yet supported by legally binding instruments. The geographic area covered by the Convention extends from the south of Colombia to the north of Mexico [Plan of Action, United Nations Environment Programme (UNEP), 2002, para. 1]. Ecuador is not a Party.

The Lima Convention for the South East Pacific (Convention for the Protection of the Marine Environment and Coastal Area of the South-East Pacific, 1981) counts Ecuador, Colombia, and Panama as State parties but not Costa Rica. It is primarily focused on the prevention, reduction and control of pollution and the environmental management of natural resources (Lima Convention 1981, Article 3.1). It is an associated RSP which means that it is not directly administered by UNEP<sup>10</sup>. Rather, the Executive Secretariat of the Lima Convention is held by

the Permanent Commission for the South Pacific (CPPS)<sup>11</sup>, an intergovernmental body, classified as an RFB by FAO [Food and Agriculture Organization of the United Nations (FAO), 2021]. It was originally established in 1952 by Chile, Peru, and Ecuador to fight illegal fishing, with Colombia joining in 1979 [Comisión Permanente del Pacífico Sur (CPPS), 2012a, Article 1]. CPPS plays a key coordinating role in the region. One of its main objectives is to coordinate the maritime policies of its member States in its area of competence in order to adopt united regional positions at international fora [Comisión Permanente del Pacífico Sur (CPPS), 2012a, Article 3]. It also plays a key linking role between marine scientific research and regional policy (UNEP-WCMC, 2017, p. 75). CPPS became the Executive Secretariat for the Lima Convention in 1981 and thus effectively carries out a dual role. In terms of geographic scope, the Lima Convention applies to the territorial seas and EEZs of participating States and has a narrow mandate in the adjacent high seas, restricted to pollution (Lima Convention 1981, Article 1). However, State parties to both CPPS (Comisión Permanente del Pacífico Sur (CPPS), 2000) and the Lima Convention have expressed their desire to expand their remit in ABNJ (Comisión Permanente del Pacífico Sur (CPPS), 2012b). Expansion of regional coverage into the high seas has been encouraged by the United Nations [United Nations Environment Assembly (UNEA), 2016, para. 13] given that only five Regional Seas Conventions (RSCs) currently have jurisdiction in ABNJ. In relation to MPAs, it is important to note that CPPS has an advisory mandate only and no management authority (UNEP-WCMC, 2017, p. 75) which means it does not yet have the power to establish such legally binding conservation measures. However, State parties to the Lima Convention adopted a Protocol for the Conservation and Administration of Marine and Coastal Protected Areas in the South East Pacific (1989) in which they committed to establishing

<sup>8</sup> Mexico, El Salvador, Honduras, Nicaragua and Guatemala.

<sup>9</sup> The Convention needs at least four country ratifications to come into force and only two countries (Guatemala and Panama) have ratified it thus far (as of 2016) (United Nations Environment Programme (UNEP), 2021b).

<sup>10</sup> When UNEP administers a RSP, the Secretariat, administration of the Trust Fund and financial and administrative services are provided by UNEP. However, in an associated RSP, the financial and budgetary services are managed by the program itself or hosting regional organizations (Rochette et al., 2015, p. 10).

<sup>11</sup> CPPS is the Spanish acronym for Comisión Permanente del Pacífico Sur.

more protected areas within their national jurisdictions (Article II). This protocol led to the creation of a regional network of MPAs in the South East Pacific, which aims to strengthen the management of existing MPAs in the region and expand the network based on scientific information and in line with international law [Comisión Permanente del Pacífico Sur (CPPS), 2010]. The network includes the MPAs of Galapagos, Malpelo, Gorgona, and Coiba.

Regional Seas Programs usually have no management or regulatory mandate in relation to fisheries, which are covered by RFBs. RFBs are advisory regional mechanisms through which States cooperate on the sustainable use and conservation of marine living resources, established pursuant to UNCLOS (Article 118). Regional Fishery Management Organizations (RFMOs) are a subset of RFB with a management mandate and the power to establish legally binding conservation measures regarding fisheries, which include area-based management tools such as temporary closures [UN Fish Stocks Agreement (FSA), 1995, Articles 8–13]. The only competent RFMO in the region covered by CMAR is the Inter-American Tropical Tuna Commission (IATTC), of which all four States are members. The IATTC covers a large geographic area in the eastern Pacific Ocean bounded by the coastline of North, Central, and South America (Antigua Convention, Article 3); it includes both the national jurisdictions of the Contracting parties and the high seas in the Convention area. The fish stocks covered are tunas and tuna-like species and other species of fish taken by vessels fishing for tunas and tuna-like species in the Convention area (Antigua Convention, 2003 Article 1). Given that the CMAR region is surrounded by the high seas, it is also worth mentioning that Ecuador is a member of the South Pacific RFMO (SPRFMO), and Panama is a non-contracting Party. The SPRFMO was established in 2012 to cover a gap regarding management of non-highly migratory fishing resources and associated marine ecosystems in the high seas of the South Pacific (Articles 1, 2, 5, Convention on the Conservation and Management of High Seas Fishery Resources in the South Pacific Ocean, 2012).

The RSP and RFBs are intergovernmental bodies made up of State parties whereas LME mechanisms are usually projects which bring together coastal States, international agencies and regional bodies [United Nations Environment Programme (UNEP), 2016, p. 42]. LMEs are large areas of ocean space adjacent to continents in coastal waters where primary productivity is generally higher than in open ocean areas, and which are based on ecological delimitations rather than political or economic criteria (Sherman and Hempel, 2008, pp. 3–5). They are considered a useful addition to the ROG landscape in terms of their emphasis on science [United Nations Environment Programme (UNEP), 2016, p. 39]. A significant coastal part of the ETP region, including the coastal waters of the CMAR states, is covered by the Pacific Central American LME, however, CMAR has not had any interaction with it. While LMEs are considered as having a solid ecological basis, they have been criticized for weak governance components, especially in developing countries (Bensted-Smith and Kirkman, 2010, p. 3).

Therefore, as demonstrated, CMAR is not covered by one single ROG framework, but rather parts of it fall within the

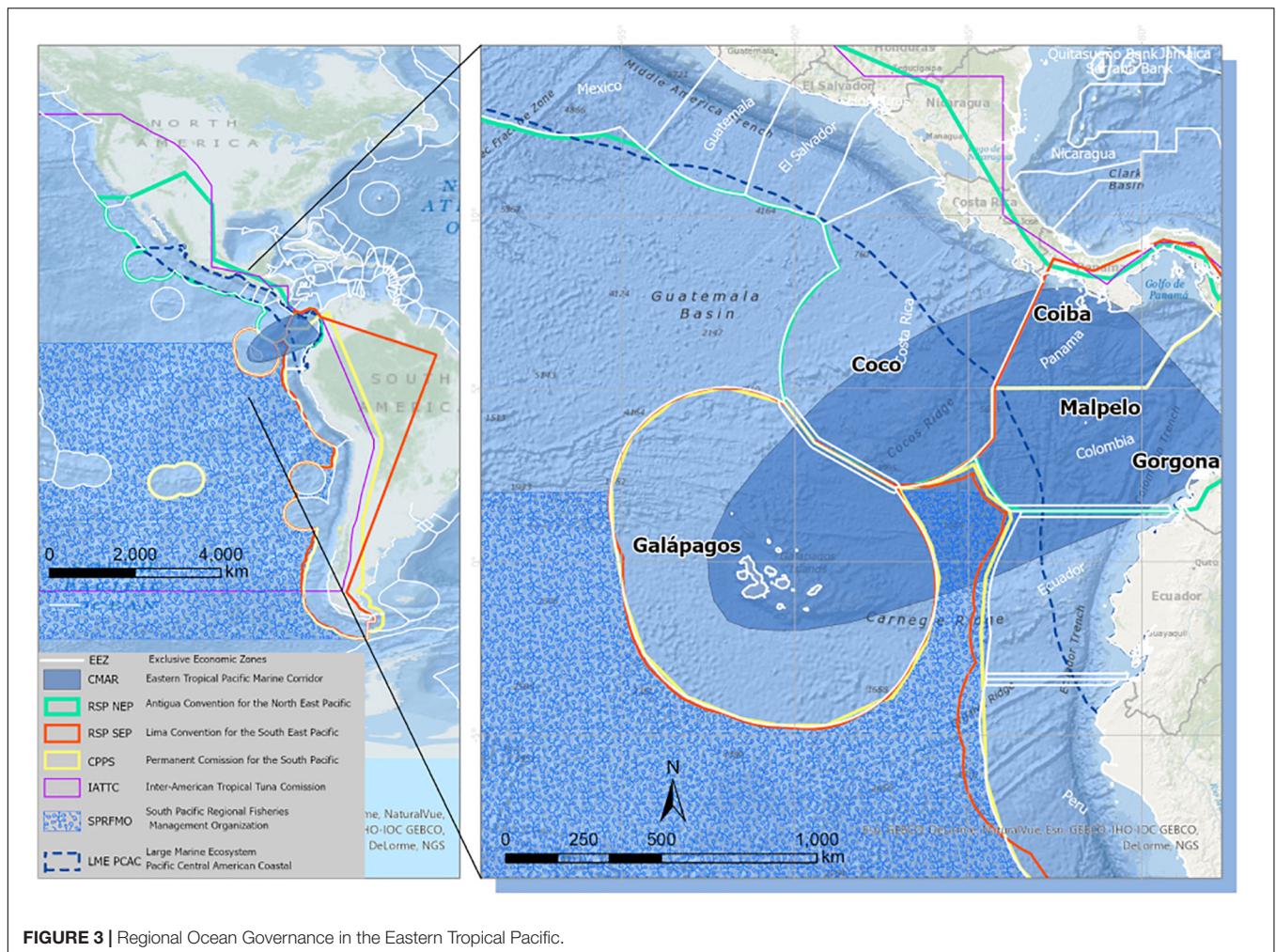
geographic mandates of several mechanisms (see **Figure 3** and **Table 1**). Studies on ROG have warned that where there is different State participation in different ROG mechanisms, decisions of one mechanism may not be applicable to all participants in other relevant mechanisms [United Nations Environment Programme (UNEP), 2016, pp. 50–51], which can lead to wider fragmentation in the region and a lack of a cohesive ocean governance approach. The overlaps and gaps between mandates and geographical coverage of all these different mechanisms is a key challenge for effective ROG.

## Possibilities for Integration

Previous studies examining ROG arrangements in the ETP region have observed that integration is weak with no overarching mechanism in place (Mahon and Fanning, 2019a, p. 5). In general, cooperation between the key actors is not well developed and enthusiasm for enhanced collaboration is varied. For example, the IATTC has expressed concern that cross-sectoral area-based planning initiatives may compromise its ability to adopt a flexible approach to species protection (UNEP-WCMC, 2017, p. 83). Given that fishing is a fundamentally important socio-economic activity in the region, there has been a reluctance by some authorities to commit to sharing data and information on those resources (UNEP-WCMC, 2017, p. 81). Therefore, it is not surprising that at the time of the adoption of the San Jose Declaration (SJD) in 2004 the creation of a new regional mechanism was criticized as being premature prior to adequately exploring the scope for working with existing bodies in the region, such as the CPPS, Navies and the fishing sector (Bensted-Smith and Kirkman, 2010, p. 98).

While the CPPS has a lot of support in the South East Pacific as a cross sectoral coordinating mechanism (UNEP-WCMC 2017, p. 79), it does not cover enough of the ETP region to play an integrating role (Mahon and Fanning, 2019a, Supplementary Material, pp. 4–5). In recent years it has signed bilateral cooperation agreements with the IATTC (IATTC, 2015) and the SPRFMO (SPRFMO, 2019) for the purposes of improving conservation. Areas of cooperation between the CPPS and the SPRFMO are focused on information exchange, specifically sharing of scientific data, meeting reports and other documents or publications considered to be of mutual interest. Specific mention is made of data exchange in relation to *inter alia* IUU fishing activity and bycatch [SPRFMO, 2019, Clause 2 (iiib,c)]. Given the importance of the fishing sector in the region, this type of cooperation is to be commended, especially given that RFMOs have the power to establish legally binding conservation measures. With regard to the IATTC, its 2015 Memorandum of Understanding (MoU) with the CPPS expired in 2020 and cooperation efforts have stalled. Analysts say more efforts are needed in general with regard to cross sectoral cooperation in the region. A recent report recommends the adoption of a tri partite MoU agreement between the CPPS, IATTC, and SPRFMO for the purposes of formalizing cross sectoral cooperation on data collection, data analysis, joint monitoring and enforcement actions in the South East Pacific (Cremers et al., 2020, p. 40).

CMAR and CPPS have similar action plans and are currently working toward a cooperation agreement. In relation to cooperation between CMAR and the RFMOs, CMAR has had



**FIGURE 3 |** Regional Ocean Governance in the Eastern Tropical Pacific.

no contact with the SPRFMO, but the Technical Secretariat of CMAR has participated as an observer in IATTC committee meetings and meetings of the Parties. There may be scope for a cooperation agreement with the IATTC in the future. CMAR has also held meetings with other fisheries organizations in the region, which operate within the EEZs, the Central American Fisheries and Aquaculture Organization (OSPESCA), of which Costa Rica and Panama are members, and the Latin American Organization for Fisheries Development (OLDEPESCA), which counts Ecuador, Panama and Costa Rica as members.

The BBNJ negotiations and subsequent international instrument may offer a unique opportunity to improve ROG in the ETP region. In response to the significant governance gaps under the current international legal framework for the oceans, such as the incomplete coverage of ABNJ by existing instruments, a disjointed institutional framework lacking mechanisms for coordination across sectors and regions and the lack of a global legal framework for MPAs (Gjerde et al., 2019, p. 4–5), the international community initiated negotiations for a new international treaty under UNCLOS for the conservation of marine biodiversity in ABNJ. The treaty negotiations are limited to four issues: marine genetic resources, including

benefit-sharing, area-based management tools, including marine protected areas, environmental impact assessments and capacity-building and marine technology transfer [United Nations General Assembly (UNGA), 2017]. From the outset, the United Nations General Assembly (UNGA) instructed States that the new instrument ‘should not undermine existing relevant legal instruments and frameworks and relevant global, regional and sectoral bodies’ [United Nations General Assembly (UNGA), 2017, para. 7]. While it is likely that existing ROG bodies will have an important role to play under the new instrument, questions of institutional design and delegation of authority to existing or newly created bodies have been key sticking points in negotiations (De Santo et al., 2020). Thus far, a range of institutional design options have been proposed, encompassing a spectrum of global, hybrid, and regional approaches (Clark, 2020). Those advocating a global approach would like to see the creation of a new global body with the power to make legally binding decisions, including with respect to the establishment of MPAs, which would coordinate existing sectoral and regional bodies and fill governance gaps (Morgera et al., 2018, p. 16). Advocates of the regional approach would prefer efforts to be focused on strengthening existing regional bodies and enhancing

**TABLE 1 |** Regional Ocean Governance in the Eastern Tropical Pacific.

| Organization   | Jurisdiction  | Mandate   | Parties  | Legal basis   |
|--|---|---|--|---|
| Eastern Tropical Pacific Marine Corridor (CMAR)  | [Proposed] EEZs of Ecuador, Colombia, Panama and Costa Rica and high seas pocket between the Galapagos Islands and Ecuador  | Conservation and sustainable use of marine biodiversity in the Eastern Tropical Pacific   | <i>Ecuador, Colombia, Panama, Costa Rica</i>   | San Jose Declaration (SJD), 2004<br>Not yet officially delimited  |
| UN Regional Seas Program for North East Pacific (RSP NEP)  | [Proposed] The area between the extreme south of the Pacific seaboard of Colombia, where it borders Ecuador, to the extreme north of Mexico on the Pacific, at its border with the United States                          | Sustainable development of the marine and coastal resources of the North East Pacific   | <i>Colombia, Panama, Costa Rica, Nicaragua, El Salvador, Guatemala, Mexico, Honduras</i>   | Antigua Convention for the North East Pacific 2002<br>Not yet in force  |
| UN Regional Seas Program for South East Pacific (RSP SEP)  | EEZs of Chile, Peru, Ecuador, Colombia, Panama and the high seas up to a distance within which pollution of the high seas may affect that area  | Prevention of pollution and environmental management of natural resources within area of competence   | <i>Ecuador, Colombia, Panama, Chile, Peru</i>  | Lima Convention for the South East Pacific 1981   |
| Permanent Commission for the South Pacific (CPPS). Regional Fisheries Body (RFB)                   | EEZs of Chile, Peru, Ecuador, Colombia  | Conservation and sustainable use of all living resources within area of competence  | <i>Ecuador, Colombia, Chile, Peru</i>  | Santiago Declaration 1952   |
| Inter-American Tropical Tuna Commission (IATTC). Regional Fisheries Management Organization (RFMO) | The area of the Pacific Ocean bounded by the coastline of North, Central, and South America and by the lines described in Article III of the Antigua Convention Includes EEZs of Ecuador, Colombia, Panama and Costa Rica | Conservation and sustainable use of tuna and tuna like species  | <i>Ecuador, Colombia, Panama, Costa Rica, Belize, Nicaragua, Guatemala, El Salvador, Venezuela, Mexico, Canada, United States, China, Japan, Taiwan, Kiribati, South Korea, Vanuatu, France, EU</i>      | Antigua Convention 2003   |
| South Pacific Regional Fisheries Management Organization (SPRFMO)                                  | Waters of the Pacific Ocean beyond areas of national jurisdiction as delimited in Article 5 of the Convention Includes high seas pocket between Galapagos and Ecuador   | Conservation and sustainable use of all fish (except sedentary species, highly migratory species, anadromous and catadromous species, marine mammals, marine reptiles, seabirds) in the high seas of the South Pacific and the safeguarding of the ecosystems in which they occur | <i>Ecuador, Peru, Chile, China, Cook Islands, Cuba, European Union, Denmark (re. Faroe Islands), South Korea, New Zealand, Chinese Taipei, United States, Vanuatu. Panama is a non-contracting Party</i> | Convention on the Conservation and Management of High Seas Fishery Resources in the South Pacific Ocean, 2012 |
| Large Marine Ecosystem Pacific Central American Coastal (LME PCAC)                                 | Bordering Mexico, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Colombia, and Ecuador  | Integrated, ecosystem-based Management of the Pacific Central American Coastal Large Marine Ecosystem   | <i>Ecuador, Panama, Costa Rica, El Salvador, Guatemala, Honduras, Mexico</i>   | N/A   |

coordination among them (Morgera et al., 2018, p. 16). A hybrid approach would seek to share competences between existing bodies and a new global body (Oude Elferink, 2019, p. 3). Whichever option is eventually taken, there is clearly an opportunity here for interested ROG bodies to expand their role in high seas governance.

## CONCLUSION

“Indigenous” or “home grown” ROG approaches such as CMAR appear to engage more active participation of coastal States. In the case of CMAR, its four member States have remained politically engaged in the initiative since its inception 17 years ago and are committed to strengthening CMAR from a legal, governance and financial sustainability perspective. Notable successes to date include permanent coordination between the technical components of CMAR, knowledge exchange and coordination between the core MPAs of CMAR and political coordination between the four Ministries of the Environment, which has facilitated the adoption of joint positions at international fora and in the face of common threats in the region such as overfishing (e.g., CMAR Comunicado de Prensa, 12 August 2020 regarding the presence of an industrial fleet of foreign flagged fishing vessels in international waters adjacent to the Galapagos Islands).

However, CMAR suffers from several of the same weaknesses that afflict ROG more generally, including a lack of interaction with important socio-economic sectors such as fisheries, scarce resources and political instability among some participating States (Rochette et al., 2015, p. 13). Given that individual governments are ultimately responsible for the implementation and enforcement of conservation measures within their respective territories, the long-term success of CMAR will depend on political will. However, from a policy perspective, integration within the wider ROG context via cooperation and coordination with key intergovernmental bodies in the region, such as the CPPS, could be a way to enhance CMAR's standing, especially on a wider regional and global scale. Bensted-Smith and Kirkman (2010, p. 4). suggest that the UNEP RSP program can play an important role in management of large marine areas if they collaborate with the governments involved and other relevant organizations that can bring about results in terms of *inter alia* behavior change, enforcement, biodiversity and species populations. Benefits that engagement with the RSP can offer include its well-established institutional structure, which provides a useful global platform for regions to insert themselves into the global ocean governance architecture while at the same time retaining their focus on the particularities of their region [United Nations Environment Programme (UNEP), 2016, p. 27]. There is general agreement that ROG, including the RSP, plays an essential linking role between the global and national level of governance (Rochette et al., 2014, p. 109). For example, the RSP has valuable regional frameworks for assessing the state of the marine environment, addressing key activities that impact on it and agreeing appropriate responses, which can provide a useful baseline for tracking progress against globally agreed targets, such as MPA coverage (Johnson et al., 2014,

p. 76–77). This can be seen via the MPA Protocol and associated MPA Network created by the RSP for the South East Pacific. Additionally, it has been found that a coherent regional approach to design, compliance and enforcement of MPA networks is an optimal way to counter commercial and industrial forces actively working against sustainable development (Johnson et al., 2014, p. 75). If the global ocean governance system is to move toward a more joined up, connected and coordinated approach, encouraged by the new BBNJ instrument, then it too would benefit from increased links with “bottom-up” regional cooperation mechanisms such as CMAR, which are often left out of global coordination mechanisms due to lack of direct association with a UN body (Mahon and Fanning, 2019b, pp. 10–11).

The importance of the regional and sub-regional levels of governance is being increasingly recognized in the field of ocean governance. There is a growing understanding of the effectiveness of multi-level governance, whereby governance arrangements at any level (local, national, subregional, regional and global) are recognized as equally important (Blanchard et al., 2019, p. 5; Mahon and Fanning, 2019b, p. 1). In fact, it has been recommended that the BBNJ agreement specifically recognize regional cooperative agreements as a means of operationalizing ecosystem-based management (Gjerde and Wright, 2019, p. 18). The BBNJ agreement could create supportive conditions as well as practical arrangements to enable effective cross-sectoral cooperation within and between regions by providing “top down” oversight via global rules and standards (Gjerde and Wright, 2019 p. 18), ensuring an appropriate distribution of competence across the global, regional and sectoral levels (Blanchard et al., 2019, p. 7) and adopting a flexible approach to institutional arrangements which would recognize that different options may be required for different regions of the world (Clark, 2020, p. 5). In any event, as a critical first step, the ROG framework applicable to the ETP needs to be strengthened. As it currently stands, it is fragmented, with limited cross sectoral cooperation, differing membership compositions and varying geographic coverage. When the IPCC recently emphasized the importance of MPA networks for the maintenance of essential ecosystem services provided by the ocean, it cautioned that “geographic barriers [...] and barriers to regional cooperation limit the potential for such networks” [Intergovernmental Panel on Climate Change (IPCC), 2019, p. 35]. The move by CMAR towards cooperation with the CPPS is a positive step forward for integration in the wider region. However, in order to eventually achieve a truly integrated ecosystem-based approach to management for the region, all regional players will need to coordinate their efforts and share information. Finding a suitable platform for this level of engagement is a crucial next step.

## DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

## AUTHOR CONTRIBUTIONS

SE was the main author of the manuscript. RM-O contributed data and input to the following sections: Eastern Tropical Pacific Marine Corridor, Regional Ocean Governance in the Eastern Tropical Pacific, and Conclusion. IK assisted in the writing of the section on the Eastern Tropical Pacific Ocean. All authors contributed to the article and approved the submitted version.

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# The Sargasso Sea Commission: An Evolving New Paradigm for High Seas Ecosystem Governance?

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The Sargasso Sea is to be found within the North Atlantic Subtropical Gyre. Its borders are the major ocean currents. These boundaries shift with these currents, but there is a core area that covers approximately 2 million square nautical miles situated around the Bermuda archipelago, the majority of which is beyond the national jurisdiction of any State. Ten governments have now signed the 2014 Hamilton Declaration on Collaboration for the Conservation of the Sargasso Sea, which mandated the Government of Bermuda to appoint the members of the Sargasso Sea Commission—the first such body to take on a stewardship role for a high seas ecosystem. The Commission has committed to working with the existing international organizations with jurisdictional competences over a myriad of high seas activities. This paper will examine the work of the Commission and lessons learned over the past decade; it will discuss its possible role as a “boundary spanning” organization and look forward to its future in the light of recent grants from the Global Environment Facility (GEF) and the *Fonds Français pour l'Environnement Mondial* (FFEM).

**Keywords:** ocean governance, Law of the Sea Convention, Sargasso Sea Commission, boundary spanning, GEF, FFEM

## INTRODUCTION

In June 2014, five governments—the Azores, Bermuda, Monaco, the UK and the US met in Bermuda and signed the Hamilton Declaration on Collaboration for the Conservation of the Sargasso Sea (Freestone and Morrison, 2014; Hamilton Declaration, 2014). This was the culmination of a two year negotiation that involved representatives of 14 governments, plus the Canadian Senate and the EU Commission; representatives of seven international organizations also attended one or more of the meetings. Although at the last minute the EU and its Members States decided not to sign, the representatives of a number of other governments attended the 2014 meeting and spoke in support—the Bahamas, British Virgin Islands, Netherlands, South Africa, Sweden and the Turks and Caicos Islands. Puerto Rico and Trinidad and Tobago sent messages of support.

The 2014 Declaration expressly authorizes the Government of Bermuda to establish the Sargasso Sea Commission (“the Commission”) to act as “a steward” of this extraordinary part of the ocean and to “keep its health, productivity and resilience under continual review.” (Annex II para a). To date, five additional governments have signed the Declaration—the British Virgin Islands, the Bahamas and Canada in 2016, the Cayman Islands in 2017 and the Dominican Republic in 2018. The Commission and the Government Signatories to the Declaration have undertaken a number

of steps to promote conservation of the Sargasso Sea, including through interactions with other regional bodies, such as regional fisheries management organizations, and sectoral organizations, such as the International Seabed Authority.

The Declaration itself was negotiated under the auspices of the Sargasso Sea Alliance, established in 2010 and led by the Government of Bermuda. The Alliance had three aims—to draw international attention to the importance of the Sargasso Sea as a unique high seas ecosystem; to seek to work with existing international and sectoral bodies to put conservation measures in place for the Sargasso Sea; and to demonstrate what does and does not work in this context. The idea of developing a political declaration on the conservation of the Sargasso Sea arose in the early days of the Sargasso Sea project (Balton, 2021). After the development of a preliminary text by a working group, two negotiating meetings were held in Tarrytown, New York, in November 2012 and December 2013 (Freestone, 2016). The choice of a declaration, rather than a binding international agreement, was essentially pragmatic, in that it was seen as a more effective way of developing initial support from concerned governments than attempting a treaty negotiation. Binding agreements can take a long time to negotiate and then to enter into force. Moreover, governments may tend to negotiate softer language to reflect their commitments in a text that will be legally binding. Those involved in the early days of the Sargasso Sea project also recognized that it might be possible to start with a political declaration and move to a binding agreement in the future, a scenario that has worked well in other contexts, such as the North Sea (Freestone and IJlstra, 1990), dolphin conservation in the East Pacific (Hampton, 1998) and more recently in the Arctic (Schatz et al., 2019).

Having chosen to develop a political declaration rather than a binding agreement, those involved next turned their attention to the *content* of what was to become the Hamilton Declaration. Once again, they chose to begin with a gentle approach, in hopes of attracting maximum support from relevant governments. This approach emphasized voluntary cooperation between governments in protecting the Sargasso Sea, working within the accepted framework of the 1982 United Nations Convention on the Law of the Sea (LOS, 1982), and engaging with existing regional and sectoral regimes such as the regional conventions for the conservation of the environment of the North East Atlantic (OSPAR, 1992), the Wider Caribbean (Cartagena Convention, 1983) and West Africa (Abidjan Convention, 1981), regional fisheries management organizations, and the International Seabed Authority, among others. The Hamilton Declaration would not establish a new international organization with the authority to adopt binding measures, nor would it include mandatory financial commitments. The Commission to be created would have an essentially custodial and educative role, would have legal status under Bermudian law rather than international law, and would receive support solely through voluntary contributions.

The Declaration envisages a light institutional structure with a regular Meeting of Signatories, a Commission and a Secretariat “to assist the Commission and the Signatories.” The Hamilton Declaration structure is unusual in that not all the Signatory

governments represent autonomous States and that the Sargasso Sea Commission is not composed of representatives of the participating governments. Instead, the Declaration envisages that the Government of Bermuda, after consultation with the Signatories and Collaborating Partners, will appoint the Commission “composed of distinguished scientists and other persons of international repute committed to the conservation of high seas ecosystems that would serve in their personal capacity.” Not only do the Commission members not represent the Signatory governments, they do not even need to hold their nationality. The role of the Commission members is set out in Annex II of the Declaration. It is to “exercise a stewardship role for the Sargasso Sea and keep its health, productivity and resilience under continual review.” The Commissioners serve three-year renewable terms, although the terms of the first Commissioners were staggered to ensure regular rotation. The first five Commissioners were appointed by the Bermuda Cabinet in August 2014 and appointments have been made in that way annually since then. In 2017 the number of Commissioners was increased to seven.

## A UNIQUE HIGH SEAS ECOSYSTEM

The Sargasso Sea has been described as:

“a unique and extraordinary ecosystem located within the North Atlantic Subtropical Gyre and bounded on all sides by the clockwise flow of major ocean currents: the Gulf Stream and North Atlantic Drift to the west and north, the Canary Current to the east, and the North Equatorial Current and Antilles Current to the south. Hence, the boundaries of the Sargasso Sea shift with these currents, but its core area covers approximately 2 million square nautical miles around the islands of Bermuda, most of which is beyond the national jurisdiction of any state<sup>1</sup>. The Sargasso Sea is named after its floating *Sargassum* seaweed that supports a diverse and productive ocean ecosystem. Two species of distinctive golden *Sargassum*—which reproduce holopelagically without contact with land—are found primarily in the Sargasso Sea (*Sargassum natans* and *S. fluitans*).

The *Sargassum* mats and windrows provide shelter and nutrients for a wide variety of species, some endemic and some endangered, like sea turtles, as well as a number of commercially important species like billfish and tunas. It is also on the migration route of many species, including sharks and cetaceans. It is also thought to be the only place in the world where the critically endangered catadromous European eel (*Anguilla anguilla*) and endangered American eel (*A. rostrata*) spawn (Schmidt, 1922). Surrounding the archipelago of Bermuda and within the area of the Sargasso Sea lies an abyssal plain some 4,000 metres deep, with three groups of seamounts that are 70 to 90 million years old: the New England and the Corner Rise seamounts to the north, and to the east the Mid-Atlantic Ridge Seamounts (Freestone and Bulger, 2016).

Since 2011 there have been regular mass strandings of thousands of tons of *Sargassum* on beaches within the Caribbean, Gulf of Mexico and the coasts of West Africa and South America (Freestone et al., 2016; Roe et al., 2021). The blooms were

<sup>1</sup>For a map see <http://www.sargassoseacommission.org/index.php>

identified as a previously rare form of *Sargassum* (*S. natans* VIII) (Schell et al., 2015; Amaral-Zettler et al., 2017). It differs morphologically from both *S. fluitans* and *S. natans* and hosts reduced communities of animals which in turn make it less attractive to fish, turtles and seabirds which feed on or beneath the *Sargassum* mats (Martin, 2016). Consequently, changes in *Sargassum* type or distribution could impact species diversity and abundance. So far, these blooms have not impacted the Sargasso Sea directly but they have the potential to do so via reduced *Sargassum* communities and because they are preventing successful nesting of turtles on the affected beaches around the Caribbean (Johnson et al., 2013; Franks et al., 2016; Djakouré et al., 2017; Putman et al., 2018; Johns et al., 2020).

The Sargasso Sea is also of interest from a legal perspective, in that although it is situated between Europe and North America, there is no regional environment agreement equivalent to the OSPAR in the North East Atlantic region, and while the International Convention for the Conservation of Atlantic Tunas (ICCAT, 1966)—the sectoral Atlantic tuna convention—covers the whole Atlantic, there is no regional fisheries regime covering its core areas—equivalent to the North-west Atlantic Fisheries Organization (NAFO, 1992) or the North East Atlantic Fisheries Commission (NEAFC, 1980). The only international bodies with regulatory powers are ICCAT (for tuna and tuna-like species), the International Maritime Organization (IMO, 1958) for vessel movement and pollution control and the International Seabed Authority (ISA) established by the LOSC to regulate deep sea mineral exploration and exploitation).

## THE WORK OF THE COMMISSION

In October 2014 the newly established Commission met with the Government Signatories to the Declaration and together they agreed six priority areas for its first 2 year work program (Freestone and Bulger, 2016). These priority areas are each discussed below, although not in any order of importance.

### International Recognition of the Ecological Importance of the Sargasso Sea

The first achievement of the new Commission in relation to its first aim of achieving international recognition of the importance the Sargasso Sea was its “description” as an Ecologically or Biologically Significant Area (EBSA) by the Parties to the 1992 Convention on the Conservation of Biological Diversity (CBD, 1982). The Sargasso Sea project supported the presentation by Bermuda of the case for the description of the Sargasso Sea as an EBSA at a workshop in Recife, Brazil, it was then recognized by the CBD Parties at the 11th Session of the Conference of the Parties (COP11) in Hyderabad, India, in October 2011 (CBD, 2011). The Commission has continued to leverage this description in other fora (Freestone and Morrison, 2013).

In 2012 and every year since then the UN General Assembly (UNGA) has included text welcoming the work of the Sargasso Sea Alliance, and latterly the Commission, in its Annual Omnibus Resolution on Oceans and Law of the Sea. In 2016 the *First*

*Assessment Report of the UN Global Reporting and Assessment of the State of the Marine Environment*—commissioned a chapter on the Sargasso Sea. The Sargasso Sea was the only named ecosystem with a separate chapter in that report (Freestone et al., 2016). That chapter was updated in the Second Assessment in 2020 (Roe et al., 2021). The Commission has also established a network of bilateral links with key organizations with related competencies or similar objectives. The Commission has formal Observer status with the Northwest Atlantic Fisheries Organization, with the International Seabed Authority, the Western Central Atlantic Fisheries Commission (WECAFC, 1973) and the Inter-American Convention for the Protection and Conservation of Sea Turtles. It has a Collaboration Arrangement with OSPAR dating from 2011, which is being updated, and a 2017 MOU with the UN Environment Programme in relation to the West African Abidjan and the Wider Caribbean Cartagena Conventions—its closest Regional Seas Programmes. Finally, the Commission is in the process of negotiating MOUs with NAFO and with ICCAT. In total, the Commission also has more than 30 formal Collaborating Partners (envisaged by paragraph 11 of the Hamilton Declaration), as well as a number of Programmatic Partners.

### Fisheries and Fisheries Habitat Conservation

As indicated above, two Regional Fisheries Management Organizations (RFMOs) have jurisdiction in areas of the Sargasso Sea—ICCAT (ICCAT, 1966) and NAFO (NAFO, 1979). Since 2010, representatives of the Sargasso Sea project and the Sargasso Sea Commission have attended the annual round of meetings of ICCAT and its scientific bodies. More than fifteen dedicated major research papers have been contributed to the ecosystem subcommittee of the Standing Committee on Research and Statistics (SCRS or the Science Body), and the government of Bermuda—with Commission support—has proposed two resolutions relating to the Sargasso Sea, both of which were adopted after some amendment in the Commission plenary sessions (ICCAT, 2012). The most recent Resolution, 16–23 provided that “As part of advancing the work of Ecosystem Based Fisheries Management, the SCRS will examine the available information on the trophic ecology of pelagic ecosystems that are important and unique for ICCAT species in the Convention Area” (ICCAT, 2016). The Commission ICCAT team is currently working on extending the “indicator-based ecosystem report card” developed by the SCRS ecosystem sub-committee to the Sargasso Sea (Kell and Luckhurst, 2018; Kell et al., 2019).

In September 2012, after the CBD EBSA description, the NAFO Scientific Council was formally asked, on behalf the Sargasso Sea project, to comment and advise on whether the Sargasso Sea provides forage area or habitat for living marine resources that could be impacted by different types of fishing, and on whether there is a need for any closure to protect this ecosystem. After some considerable internal discussion, in late 2016 at its 37th Annual Meeting in Halifax, NAFO agreed to:

“(1) prohibit the use of attachments of mid-water trawling gear that could damage or touch the seabed, and required all

Vulnerable Marine Ecosystem indicator species caught during mid-water trawling be reported;

(2) close completely all seamounts in the NAFO area to bottom trawling activities until the end of 2020 by prohibiting bottom trawling exemptions for exploratory fishing, to the closure of seamounts [including those in the Sargasso Sea EBSA] to deep sea bottom fishing through 2020 and included restrictions on the use of certain types of midwater trawling gear in the areas near those seamounts (Diz, 2016).

This decision by NAFO is the first legally binding measure that the Sargasso Sea initiative has achieved to date.

## Impacts From International Shipping

In 2011, the Alliance sponsored the preparation of a detailed report—based on AIS data—on shipping through the Sargasso Sea (SSC, 2011b). The Alliance also hosted It has sponsored two side events at the IMO Marine Environment Protection Committee Meetings. Some considerable interest was generated by these events. The Commission is still considering the possibility of making proposals to IMO in relation to shipping activities in the Sargasso Sea.

## Impacts to the Seafloor and Seabed

In October 2014 the Commission collaborated with the International Cable Protection Committee (ICPC) to co-host a workshop on *Submarine Cables in the Sargasso Sea: Legal and Environmental Issues in Areas beyond National Jurisdiction*. The Workshop Report is published on the Commission and ICPC websites (De Juvigny et al., 2015; SSC, 2015). The ICPC is a formal Collaborating Partner of the Commission.

The regulation of the exploration and exploitation of seabed minerals in the areas beyond national jurisdiction (ABNJ) in the Sargasso Sea (SSC, 2011a) is within the explicit mandate of the International Seabed Authority in Jamaica (ISA). The ISA was represented as an observer at the Hamilton Meeting. In 2016/5 the Commission was granted Observer status and in 2020 the Secretariats of the ISA and the SSC signed an MOU.

## Conservation of Migratory Species

At various point in their respective life cycles, a number of migratory species pass through the Sargasso Sea and make use of it. These include several endangered or critically endangered species of sea turtle, including green turtles (*Chelonia mydas*), hawksbill turtles (*Eretmochelys imbricate*), loggerhead turtles (*Caretta caretta*), and Kemp's Ridley turtles (*Lepidochelys kempii*). The young turtles in particular use *Sargassum* weed for cover, feeding and nursery habitat.

Since 2013, the SSA has been working with the Secretariat of the Inter-American Convention for the Protection and Conservation of Sea Turtles (IAC, 2001). In 2014 the Secretariats collaborated on the development of a joint information paper on the crucial significance of *Sargassum* and the Sargasso Sea for Atlantic sea turtles. That short paper demonstrated how important the migration links between Bermuda and the Sargasso Sea and many of the Central American countries were for sea turtles (SSC, 2014).

In 1922 Johannes Schmidt first proposed that the European eel (*Anguilla anguilla*) and American eel (*A. rostrata*) spawn in the Sargasso Sea (Schmidt, 1922). In the hundred years since then eel populations have plummeted worldwide and both these species are classified as “endangered” by IUCN Red List and the European eel is “critically endangered” (Freestone and Morrison, 2012). In the spring of 2014 the London Zoological Society was commissioned to prepare a scientific proposal to support the listing of the European Eel under Appendix II of the Convention on Migratory Species (CMS, 1979). The Convention envisages such a listing to be appropriate if the species has an “unfavorable conservation status” and if their “conservation status” would “significantly benefit from the international cooperation that could be achieved by an international agreement.” (CMS, Art IV (1)).T

In 2014, the government of the Principality of Monaco (in its capacity as a signatory to the Hamilton Declaration) put forward the report on behalf of the Commission. After approval by the CMS Science Council it was sent to the CMS Conference of the Parties in Quito in November 2014 where it was approved (CMS, 2014). Since then, the SSC Secretariat has collaborated with the CMS Secretariat in the convening of Three Workshops of the Range States of the European eel. In February 2020 as a result of a proposal from the Third Workshop in Malmo in June 2019 the CMS COP 13 approved the preparation of a Single Species Action Plan for the European eel, work that is being supported by the SSC but also by the Governments of Monaco and Sweden and the EU Commission.

The Commission has also sought to develop a role in relation to the American Eel in 2018—at the request of (and with financial support of) Canadian DFO and the US FWS it organized a workshop of American Eel Range States in Santo Domingo, Dominican Republic, to develop a joint submission to the CITES Animals Committee meeting in the spring of 2018 (SSC, 2018a). At the request of DFO in 2021, it will organize a virtual workshop of those range States with significant American eel fisheries to develop a future plan of action for collaboration.

## Defining Role in Data and Information Management

The Commission, assisted by key marine researchers and scientists, is also involved in an invaluable collaboration with the US National Aeronautics and Space Administration (NASA) aimed at developing a multidimensional mapping tool. This tool will use the Sargasso Sea as a pilot area. The CEOS Ocean Variables Enabling Research and Applications for GEO (COVERAGE) initiative is a NASA-led research and development project and cross-cutting, collaborative effort within the Committee on Earth Observation Satellites (CEOS) that aspires to help more fully realize the potential of satellite remote sensing data among prospective, new data user communities which have a need for such products.

COVERAGE seeks to provide improved, more seamless access to inter-agency, multivariate satellite data spanning the four CEOS Ocean Virtual Constellations—sea surface temperature, ocean vector winds, ocean surface topography, ocean color

radiometry—in support of a priority set of application use cases identified by stakeholders. It additionally seeks to demonstrate a technical framework facilitating more synergistic use of remote sensing and *in situ* data for the oceans from distributed sources.

The COVERAGE project completed its pilot Phase B in 2020 and in 2021 is now moving into Phase C of implementation. This project is designed to permit users to access and visually display relevant data of their choosing. These data can combine NASA satellite observation data of oceanographic conditions, such as currents, temperature, salinity, chlorophyll as well as possibly seaweed presence and movement, with data from other sources on commercial, recreational, ecological and biological uses of the sea. The expectation is that this important project will provide an important tool with considerable future potential for high seas conservation and governance.

## A NEW PARADIGM FOR HIGH SEAS CONSERVATION?

The establishment and the work of the Commission have been described as “a new paradigm for high seas ocean conservation” (Freestone and Morrison, 2014). As can be seen, it was deliberately designed to be different from existing treaty regimes with which it has inevitably been compared (Freestone et al., 2014). One of the basic principles adopted by the Sargasso Sea project has been to base its proposals and approaches on the best available science. In 2010 it sponsored the production, and publication in a research series, of some 12 specialized reports that collected the latest scientific information on a full range of Sargasso Sea ecosystem issues, from oceanography to seabed resources, from whale migration to eels and eel spawning. These constituted the foundation for a full scale baseline science study published in 2011. This study had some fifty contributors and carried the logos of 10 leading marine science institutions from Europe and the Americas (Laffoley et al., 2011). The Commission has continued to be able to draw on the wide spread of expertise in key partners from many different disciplines—many of them now among the thirty or more formal Collaborating Partners of the Commission.

This commitment to bring the science of the Sargasso Sea to the table as the basis for all its work appears to meet the criteria for what has become known as “boundary spanning” (Goodrich et al., 2020) and has led commentators to suggest that the Commission can be seen as a boundary spanning organization (Mahon and Fanning, 2021). In 2017 it was suggested that

“... boundary spanning as a distinct practice can play a critical role in facilitating [the contribution of scientific knowledge], by reconciling the production and use of scientific knowledge to support sustainability policy and solutions ... boundary spanning has the potential to increase the efficiency by which scientific evidence informs policy, foster the capacity to absorb new evidence and perspectives, enhance research relevance for societal challenges, and open new policy windows.” (Bednarek et al., 2017)

In the context of the work on the Sargasso Sea, the discussion above may already have highlighted the preeminent role of science in the work of the Commission, but a couple of examples may illustrate the way the Hamilton Declaration design is intended to function. As part of the preparations for the Sargasso Sea baseline study in 2011, a series of detailed scientific reports were also commissioned and published on the website. One of these related to the European eel (Gollock, 2011). It was clear from this that the state of the stock met the criteria for listing under Appendix II of the Convention on Migratory Species and, as discussed above, Monaco—one of the Signatory States which is an active party to CMS—put that proposal forward. So it was the scientific work which prompted the legal action. As a follow on to that process the Commission has organized and financed, with partners, some five workshops for American and European Eel Range States representatives and scientists. As seen above, in 2020 the CMS COP13 mandated the preparation of a Single Species Action Plan for the European eel using a participatory process. It is likely that policy proposals for future conservation measures will result from that work—which is ongoing.

Another example would be the continued interaction with the ICCAT Eco-system subcommittee, again discussed above, designed to reinforce the importance of the Sargasso Sea within the ICCAT regulatory area. The Commission has sponsored basic science research including the preparation of a pelagic food web analysis for tuna and non-tuna species (Luckhurst, 2014, 2015, 2017; Luckhurst and Arocha, 2016). That work continues to drive the development of environmental indicators for an Ecosystem Based approach to Fisheries Management in the area, which is ICCAT's main EBFM initiative.

## Lessons Learned

For the last decade the UN has been discussing the idea of a new international agreement linked to the LOSC on the conservation and sustainable use of biological diversity in areas beyond national jurisdiction; since 2017 an Inter-Governmental Conference (IGC) has been negotiating such an instrument (Freestone, 2019). The lessons learned from the Sargasso Sea project have demonstrated many of the problems and limitations of working within the existing sectoral and fragmented system of ocean governance (Freestone and Gjerde, 2016).

These issues were highlighted in 2016 by Freestone and Gjerde who wrote:

“... it is clear why no one else has undertaken such an effort for a marine ecosystem beyond national jurisdiction—it is not an easy task. Despite the plethora of international organisations with an interest in ABNJ, there are only a handful with actual management competence in the Sargasso Sea area and none with a core focus on comprehensive conservation of marine biodiversity or ecosystems. The Sargasso Sea project thus provides an interesting insight into the way in which the current system of high seas governance operates.

Each sectoral regime with competence over activities in the Sargasso Sea study area has its own distinctive protection mechanisms and each assesses differently the factors that need to be taken into account. The result is a patchwork of sectoral area-based management tools designed to protect specific marine

areas from sectorally specific threats. For example, the IMO has the power to adopt MARPOL Special Areas and Particularly Sensitive Sea Areas (PSSAs) to limit some shipping impacts, non-tuna RFMOs have the power to protect vulnerable deep seabed ecosystems, and the ISA has designated nine no-mining “Areas of Particular Environmental Interest” in the Clarion Clipperton Zone based on design principles for representative networks of marine protected areas.

Each of these sectoral approaches has value, but each is developed and assessed by its own criteria and scientific evidentiary demands. None were developed with any reference to the work of other sectoral bodies and no mechanism exists for coordinating between the various sectors. Moreover, regulation within sectors may be inconsistent both globally and regionally. For example, global criteria and guidelines exist to put biodiversity conservation squarely on the agenda of RFMOs such as NAFO responsible for managing deep sea bottom fishing on the high seas, but no such criteria or guidelines exist for other forms of fishing, despite the potential for significant biodiversity impacts. On top of this, there is no mechanism for consideration of cumulative impacts from different sectors or the aggravating factor of climate change (Freestone and Gjerde, 2016).

It is also clear from the efforts of the Sargasso Sea project that there is considerable reluctance among key sectoral regulatory organizations to put into practice a number of important principles that are in major international legal and policy instruments—including the ecosystem approach and the precautionary approach. The 1992 Rio Declaration on Environment and Development provides “Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation” (UN, 1992). Despite the widespread acceptance of the precautionary approach in many international instruments relating to the marine environment (Freestone, 2011) there is still obvious reluctance to apply a precautionary approach in relation to activities on the high seas, despite that fact that precaution is particularly appropriate in these areas because scientific evidence is often scanty. An example is provided by the IMO PSSA Guidelines that provide that is “helpful” to have “...any evidence that international shipping activities are causing damage and whether damage is of a recurring or cumulative nature.” (IMO, 2001). This suggestion in the guidelines is in practice, treated as if it is an evidentiary requirement by many influential delegations at IMO. It is significant that IMO has yet to designate a high seas area as a PSSA (Freestone and Harris, 2017).

These lessons learned have also demonstrated what has been called the “fractured” system of high seas governance (Freestone, 2018)—where too little attention is paid by one sector to the activities of other sectors and the cumulative impacts that may result. The UN IGC is considering a draft treaty text which would provide an overarching legal framework for areas beyond national jurisdiction. This could provide the mechanisms for an holistic over view of all human activities in ABNJ with more rigorous requirement for Environment Impact Assessments and maybe Strategic Environmental Assessments. The Conference of the Parties (COP) may also be able to provide a much needed impetus for global recognition of regional initiatives

in high seas conservation—using the so called area based management tools like MPAs—thereby widening their legal impacts (Freestone, 2019).

While these lessons learned may have been of some value to the IGC negotiators in addressing the challenges of the new treaty regime being negotiated, they did also demonstrate that the innovative structure developed by the Hamilton Declaration did have a number of intrinsic limitations.

In March 2019, again with the important support of the Canadian government, the Commission organized a major meeting in Bermuda entitled “Next Steps to Strengthen Stewardship of the Sargasso Sea” (SSC, 2019). The purpose of the meeting was to gather the Commission, Signatory governments and important partners together to review their work and achievements since 2014, but also to consider whether there might be ways to increase the role and influence of the arrangements established by the Hamilton Declaration.

The Secretariat had prepared a paper “Taking the Hamilton Declaration to the next level” (SSC, 2018b) and Ambassador David Balton also prepared a more detailed background paper in consultation with the Secretariat for consideration by the meeting (Balton, 2021). In that paper he reviewed the limitations of the Hamilton Declaration arrangements and the limited mandate of the Sargasso Sea Commission. In particular, the Commission’s lack of authority to adopt binding decisions means that it cannot truly act as a steward of the Sargasso Sea directly, as more robust international regimes, such as the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR, 1980) or the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR, 1992), have done for other areas of the ocean. The Commission can only seek to influence other organizations that do have such authority, organizations that, by their own terms, have missions that do not focus on the stewardship of the Sargasso Sea. Hence, it seems likely that the ability of the Commission to broker comprehensive solutions working in partnership with existing organizations would be strengthened if it had a legally binding mandate. Not to precipitate conflicts with the powers of existing organizations but to fill regulatory gaps and facilitate arrangements between existing authorities. It may well be that a number of changes to the legal structure and mandate of the Commission will be needed to make it a more effective vehicle for stewardship of the Sargasso Sea. The most significant might entail replacing the Hamilton Declaration with a legally binding agreement that would give its Parties, acting through the Commission, authorities that are presently lacking. A new mandate could also address the governance gaps in the Sargasso Sea not covered by other organizations (SSC, 2019).

## THE GLOBAL ENVIRONMENT FACILITY GRANT

Prior to the Bermuda Meeting, the Secretariat had hired Dr. David Vousden as a consultant to prepare a draft proposal to the Global Environment Facility (GEF) to address some of the issues subsequently discussed in Bermuda. The proposal was submitted through UNDP as Implementing Agency to the GEF Secretariat

(GEFSEC) for review in autumn of 2018. Not only did GEFSEC approve the idea in principle but they also pointed out that as the project was primarily concerned with an ecosystem in ABNJ it would need to be contained within the ABNJ program planned with the financing from the seventh replenishment of the GEF trust fund (known as GEF7). This was allocated to the Food and Agricultural Organization (FAO) based in Rome to administer as a new phase of its “Common Ocean” Program. After some delays the \$30 m program proposed by FAO was approved by the GEF Council at its session in June 2020, with a \$3 m allocation to the Sargasso Sea project. UNDP had in the meantime chosen the Intergovernmental Oceanic Commission (IOC-UNESCO) as the Executing Agency for the project with a small grant to finance a team to prepare the final detailed project documentation for 4 year project for approval by the GEF CEO by summer of 2021.

The Sargasso Sea proposal follows the general format developed by GEF in relation to Large Marine Ecosystem Projects in the past. First, the preparation of a comprehensive Transboundary Diagnostic Analysis (TDA); followed by and informing a Strategic Action Programme (SAP) for future action. The SAP, to be formally approved by all the partners, may involve future funding. As this is the first project to consider a high seas ecosystem, the TDA was adapted to an Ecosystem Diagnostic Analysis (EDA) followed by an SAP.

The Secretariat has also been collaborating since 2018 with the French Office for Biodiversity and Marviva—the Central American NGO committed to the conservation of the Thermal Dome—and the Ocean University of Brest, on the preparation of a separate but complementary grant from the French Global Environment Facility (*Fonds Français pour l'Environnement Mondial*). This €3 million 5-year grant, titled “Contributing to hybrid governance to protect and manage remarkable areas on the high seas: Tropical East Pacific and Northwest Atlantic Oceans” is on track to begin during the first half of 2021 (Mackey and Arroyo, 2020).

The award of these substantial grants allows the Commission and partners to reassess the position in which it finds itself. The project began with a baseline study of the Sargasso Sea ecosystem and an assessment of human impacts, published in 2011. An excellent assessment of the state of knowledge at the time, it also highlighted how little is known about the functioning of deep water oceanic ecosystems—even of one that had been studied for decades. Moreover, in the 10 years since then a number of situations have changed. The Sargasso sea is increasing demonstrating the effects of Climate Change (Bates and Johnson, 2020); the annual influxes of *Sargassum* from the equatorial recirculation zone—now called the Great Atlantic Sargassum Belt—have become the new normal and risk contaminating the Sargasso Sea itself with the new less biodiverse *Sargassum* variant *Natans VIII*. International attention has been focused on the impacts in the ocean of plastics—especially in gyres like the North Atlantic subtropical gyre in which the Sargasso Sea sits; and the international trade in glass Anguillid eels has burgeoned, feeding a billion dollar eel farming industry in Asia, which further threatens these already endangered species. Moreover through tagging mature eels on their migrations, scientists species have inched forward in their understanding of

their spawning habitat in the Sargasso Sea (Miller et al., 2019). At an institutional level the existing FAO Fisheries Advisory Body which covers the Sargasso Sea—the West and Central Atlantic Fisheries Commission (WECAFC) has embarked on a process to negotiate its transformation into a Fisheries Management body. If the treaty revisions are agreed it may take on managerial role for the non-tuna fisheries in the high seas areas of the west and central Atlantic—including the Sargasso Sea area—which is currently a governance gap.

The GEF grant and its associated co-financing from a wider range of Collaborating Partners will enable a much more intensive diagnosis than was possible a decade ago and reflect changing global concerns—including those reflected in the UN Sustainable Development Goals—particularly Goal 14 “Life below Water.” In the initial data collection phase, for example, financed by the FFEM, key partners will collect state of the art data on key aspects of the ecosystem. The Bermuda Institute for Ocean Science (BIOS) will draw on the data collected by the two oldest running ocean time series: Hydrostation “S” and the Bermuda Atlantic Time Series (BATS); the Duke University Marine Spatial Ecology Laboratory (working with Global Fishing Watch) and Imperial College London.

The diagnosis is expecting new insights into the increases in vessel traffic though the North Atlantic—reflecting increases in global trade but also the widening of the Panama Canal in 2016 which doubled its capacity. These insights into vessel routing and possible impacts may enable a more science based approach to the International Maritime Organization—which has global responsibility for international vessel traffic issues but with whose members the Commission has not yet been able to engage constructively.

Once the Ecosystem Diagnosis begins to reveal this new level of data then there will be an opportunity to reexamine the governance issues in the light of the detailed data on human activities and impacts in the area. It will also provide an opportunity—as discussed above—to re-examine the unique system established by the Hamilton Declaration. The overarching vision of the Declaration was that the work of the Commission would be able to take an holistic overview and to highlight and then remedy the defects of the primarily sectoral system of ocean governance. While a great deal has been done in working with the sectoral organizations, there is no mechanism for assessing for example the cumulative impacts of different activities or of “filling regulatory gaps” which exist. It seems likely that the WECAFC negotiations will result in a new body with responsibility for non-tuna fisheries in the high seas area which covers the Sargasso Sea, but it clear that the fisheries bodies are still not interacting in any systematic way with the bodies which regulate for example vessel movement and operational discharges from vessels or seabed mineral exploration and possible exploitation.

## CONCLUSION

The Sargasso Sea project has been running now for more than a decade (Gjerde and Varmer, 2021). While it has certainly achieved its primary objective of bringing international

attention to the importance of this unique high seas ecosystem, it has had limited success to date in implementing conservation measures. Despite the early success of having it described as an EBSA in 2012, only one legally binding measure has resulted from its efforts—that related to the 2016 NAFO restrictions on mid water trawling.

The GEF grant and the important complementary project of the FFEM now provide an opportunity to conduct a major ecosystem assessment mobilizing significant resources and using the best of current information sources. The project has already mobilized an impressive array of stakeholders—including the Signatory governments, the Commission, associated international organizations and collaborating partners. It is also now able to use tools—not available in 2010—such as remote sensing data of natural process (now available through the NASA COVERAGE project and as well as details of vessel activities (through the pioneering work of Global Fishing Watch). Once the diagnostic work is complete then the project will look at possible new models for governance or stewardship of the Sargasso Sea. The existing work of the Commission, and the changing atmosphere brought about by the work of the UN Intergovernmental Conference on BBNJ, suggest, as the 2019 Balton report cited above indicates, that a number of changes to the legal structure and mandate of the Commission might well be needed to make it a more effective vehicle for stewardship of

the Sargasso Sea. The most significant might entail replacing the Hamilton Declaration with a legally binding agreement that would give its Parties, acting through the Commission, authorities that are presently lacking. If nothing else this might provide a consistent financing source for the work of the Commission and its Secretariat, but it seems likely that, if by then the BBNJ Treaty negotiations are completed, the stage may be set for the growth of a new class of Regional Ocean Governance Organizations (ROGOs) which would be able to take advantage of the opportunities presented by the new treaty and which will be needed to implement its provisions at a regional level. The Sargasso Sea may well be ideally positioned to be a first mover in this new arena.

## DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

## AUTHOR CONTRIBUTIONS

The author confirms being the sole contributor of this work and has approved it for publication.

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# Orchestrating the Ocean Using a National Ocean Policy: The Case of the Solomon Islands

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Oceans are governed by multiple policies at international, regional and national levels. National level policies have traditionally been sector-based, covering fisheries, tourism, environment etc. Recently more integrated and holistic National Ocean Policies (NOP) have been promulgated. The Pacific Ocean also has well-developed regional ocean-related policies spanning decades. The work presented here uses lexicometric analysis to map the interlinkages between regional and national policies to determine if they are evolving synergistically. Focusing on the Solomon Islands, due to its reliance on the ocean and producing a NOP in 2018, 13,622 expressions were extracted from the corpus of 8 national and 10 regional ocean-related policies. Network analysis displayed limited differentiation between the NOP, national sector-based policies and regional policies. Clustering of policies showed progressive splitting of policies from a single cluster, rather than by formation of a number of separate clusters. This behaviour reflects the thematic interlocking of policies: all share many themes, and the more integrative policies add a few additional sectoral themes. The themes rarely addressed in the corpus include energy, agriculture, pollution and education. The NOP was predominantly built on existing national or regional policies and their main themes rather than setting a new direction in ocean governance. The benefit of the NOP may be less about its content itself, but the creation of allied cross-ministerial architecture. With the intense pressure on the oceans and its resources in present times, there will be a growing need for more substantive policy evolution.

**Keywords:** ocean, policy, Pacific, regional, Solomon Islands, sustainability, network, lexicometry

## INTRODUCTION

### The Emergence of the Regional Ocean

The Regional Seas Programme, launched in 1974 under the auspices of the United Nations Environmental Programme (UNEP) aimed to address the accelerating degradation of the world's oceans and coastal areas through the sustainable management and use of the marine and coastal environment, by engaging neighboring countries in comprehensive and specific actions to protect

their shared marine environment (Ehler, 2006). The Regional Seas Programme implements region-specific activities, bringing together stakeholders including governments, scientific communities and civil societies (UN Environmental Regional Seas Programme, 2016). The approach echoes the Preamble of United Nations Conventions on the Law of the Sea (UNCLOS) which states “the problems of ocean space are closely interrelated and need to be considered as a whole,” (UNCLOS, 1982). This consideration led to the development of policies related to marine resources and to the sea in general which contribute to the need for a multiscale and integrated approach to the ocean (Pyć, 2019).

According to the Report of the 2002 World Summit on Sustainable Development, ensuring the sustainable development of the oceans requires effective coordination and cooperation as well as action at all levels to “promote integrated, multidisciplinary and multisectoral coastal and ocean management at the national level and encourage and assist coastal States in developing ocean policies and mechanisms on integrated coastal management,” (WSSD, 2002). Moreover, the implementation of multilateral environmental agreements such as the Convention on biological Diversity (CBD), CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) or CMS (Convention on the Conservation of Migratory Species of Wild Animals) as well as UNCLOS and the Agenda 2030 for Sustainable Development contain synergies at the regional level to foster implementation (UN General Assembly, 2003; UN ESCAP, 2020).

## Pacific Regional Ocean Approaches

Regional instruments have become important means of translating global commitments, serving as a nexus for action (Durussel et al., 2017). This is apparent in the Pacific, which although lacking a Regional Seas Programme, has a long history of regional ocean policy, perhaps reflecting the dominance of the ocean in identity, culture, geography, transport, and natural resources (Ehler, 2006). Collectively, the Pacific Island Countries and Territories (PICTs) are custodians of a vast ocean space, covering at least 40 million square kilometers, which approximately is 98 percent of the Pacific region (Fache et al., 2016). It is fair to term the Pacific Islanders as “the people of the sea,” who derive substantial socioeconomic and environmental advantage from the ocean (Pratt and Brierley, 2016).

Issues related to the sustainable management and development of the colossal Pacific Ocean are challenging (WORLD BANK, 2017; Searight et al., 2019). Consequently, the PICTs have developed frameworks and agreed to numerous commitments at regional and international levels in a bid to manage the ocean (IPCC, 2014; Pratt and Brierley, 2016). Regional policy guidance on oceans management was historically derived from the Pacific Plan and the PIROP (Pacific Islands Regional Ocean Policy and the Framework for Integrated Strategic Action; Pratt and Govan, 2010). In 2014, the Pacific Leaders synonymously decided to replace the Pacific Plan with the Framework for Pacific Regionalism (Pacific Islands Forum Secretariat, 2014). When the emphasis was shifted from Small Islands Developing States to Large Ocean States in 2015, the

ocean states were recognised as a “ocean continent” (Chan, 2018). To this effect, in 2017 the Blue Pacific narrative was endorsed by the Pacific Islands Forum (PIF) Leaders (Searight et al., 2019).

Regional institutional arrangements have followed the development of regional ocean approaches. Cross-sectoral cooperation and coordination of policies is prominently handled by the Pacific Islands Forum which was established in 1971 and its Council of Regional Organisations of the Pacific (CROP) was formed in 1988 by Forum Leaders, complimented by the Office of the Pacific Ocean Commissioner (Quirk and Harden-Davies, 2017). Council of Regional Organisations of the Pacific agencies (like SPREP, SPC, FFA, and USP) support the PIF. A Pacific Ocean Commissioner and the Office of the Pacific Ocean Commissioner (OPOC) was set up on request of PIF Leaders to focus on regional ocean management (Pacific Islands Forum Secretariat, 2015). OPOC is supported by the POA (Pacific Ocean Alliance) which is a broad coalition of ocean stakeholders from across the region, which supports inclusivity through channels of involvement of local communities and stakeholders (Evans et al., 2019).

## Multiple Ocean Policies

Notwithstanding, regional and international instruments for the ocean, nation states have agency with respect to the ocean (Pratt and Govan, 2010). This operates as multiples layers, as member countries of ocean-related international agreements (such as UNCLOS, CMS, CITES, CBD) and regional agreements through PIF (such as the framework for a Pacific Oceanscape), as well as direct responsibilities for their national ocean jurisdiction through UNCLOS (Pacific Ocean Commissioner, 2021). Thus, from a national perspective, national ocean-related sector policies, such as in fisheries, tourism and environment, have been promulgated (Pacific Ocean Commissioner, 2021).

More recently efforts have been made for the development of more holistic ocean policies, often called National Ocean Policies (NOPs) or similar, especially in Pacific countries (Vierros et al., 2016). As opposed to a more traditional sector-based management framework related to the likes of fisheries (Allan, 1957), environment and conservation (Keesing, 1993), NOPs for Pacific countries focus on the sustainable management of ocean, its resources and boundaries (Sloan et al., 2020; Pacific Ocean Commissioner, 2021). The NOP is set out to provide a cross cutting transdisciplinary instrument which remarkably has a unique disposition and can tackle the many challenges the country is exposed to (Keen and Masu, 2019; Sloan et al., 2020; Pacific Ocean Commissioner, 2021).

The work presented here focusses on Solomon Islands as it is a member country of the PIF and other regional CROP agencies through which regional ocean-related policies are disseminated. The Solomon Islands also has ocean-related sector policies and a recent National Ocean Policy approved in 2018. The NOP of the Solomon Islands followed concerted efforts through “Ocean 12”<sup>1</sup> and its working group, the Government of Solomon

<sup>1</sup>In 2015 a National Ocean summit was held by the Government of Solomon Islands, at the recommendation of which the cabinet established the “Ocean 12”; a national steering committee for integrated ocean governance.

Islands, Provincial Government staff, other stakeholders (like MACBIO, SPREP, and BMU) and community members country wide. The NOP states its alignment with existing national policies (like the National Development Strategy 2016–2035, Solomon Islands National Climate Change Policy 2012), regional policies [like Pacific Islands Regional Ocean Policy (PIROP 2015), Pacific Oceanscape 2011] and international policies and commitments [like CBD, UN Sustainable Development Goals (SDGs), UNCLOS, (SINOP, 2018; Keen and Masu, 2019)].

## The Contemporary Ocean Policy Nexus

The Pacific Ocean is steadily becoming congested with complementary policies (Song et al., 2019). Many policies antecede or overlap with the publication dates of others, including international conventions, thereby creating a pre-existing policy frame into which policies should conform, increasing diffusion and limiting evolution (Song et al., 2019). Already, noting the possible fragmentation between policy regimes, calls have been made to increase the interplay and synergy (i.e., co-operation, coordination and action) between the regional and global levels of ocean governance, especially including Areas Beyond National Jurisdiction (Gjerde et al., 2018). However, focusing on the area within national jurisdiction, the emergence of multiple regimes is also apparent, forming around the regional policies, national sector-based policies and NOPs. Whilst policies have been assumed to be supportive and complementary, limited detailed analysis of regional and national ocean-related policies have been undertaken (Dorah, 2007).

For the Solomon Islands, a Least Developed Country (LDC) and highly vulnerable to natural disasters (Bergin et al., 2019), the ocean represents a vital resource and transport route between the > 340 inhabited islands (Barclay and Cartright, 2007; UNOCHA (United National Office for the Coordination of Humanitarian Affairs), 2021). The work presented here focuses on the Solomon Islands and the interplay between the regional and national ocean-related policies as well as the 2018 NOP. The aim of the research is to map the interlinkage between regional and national ocean-related policy, in order to determine if policies are developing synergistically. Specifically, the research aimed to define the positioning and role of the recent NOP within the national and regional policy architecture.

## MATERIALS AND METHODS

### Policy Selection

Policies were selected through literature review, shortlisting and then verification/amendment by appropriate representatives. The main ocean-related policies were identified through a summary review of reports and literature to draw up a short-list of all substantial ocean-related policies at a national and regional level. The shortlist of national policies was the amended/validated by selected representatives. For the national policies three representatives from the Ministry of Fisheries and Marine Resources and one International Fisheries Law Specialist from the Solomon Islands were consulted (Transform, 2007). For the regional policies, representatives from the Office of the Pacific

Ocean Commissioner were consulted. The final list, approved by the selected representatives, included eight Solomon Islands policies (S01 – 08) and ten regional policies (R01 – R10) is provided in **Table 1**.

### Policy Profiles and Similarity

The approach used to analyse the policies is based on lexicometric content analysis, which measures the frequency of use of words within the studied texts. From these usage frequencies, mathematical and statistical indices can be derived which allow the interlinkages between texts to be interrogated and emergent perspectives to emerge. The specific methods used and described here have been designed and coded specifically for the particular requirements of the analysis rather than using proprietary lexicometric software. The application of the employed lexicometric analyses are novel for ocean policy and for the Pacific, but lexicometric analyses have been widely used in other studies including law and public policy (Boulet et al., 2019).

The extraction of the information for the analysis from the corpus of 18 policy texts into a structured hierarchical classification involved the following 6 steps (a set of definitions, a list of themes and further technical detail on steps 2, 5, and 6 are all provided in the **Supplementary Material**):

- Step 1: convert documents from .PDF to.txt format and cleaning up the files;
- Step 2: extract noun phrases (or “expressions”) from the corpus of policy texts;
- Step 3: edit and filter the list of all the distinct expressions extracted from the corpus. The list obtained forms the vocabulary of the corpus;
- Step 4: identify the main themes of interest for the characterisation and analysis of the content of policies. Partition of all themes into domains;
- Step 5: each word of each expression is put in its canonical form, its lemma, and each lemma is assigned to one and only one theme. The hierarchy lemmas < themes < domains form the taxonomy;
- Step 6: for each policy, for each theme, counting the number of distinct lemmas assigned to the theme and found in the expressions of the text. The distribution of the number of lemmas by theme constitutes the profile of the policy. Estimation of the similarity between the policies taken by pairs.

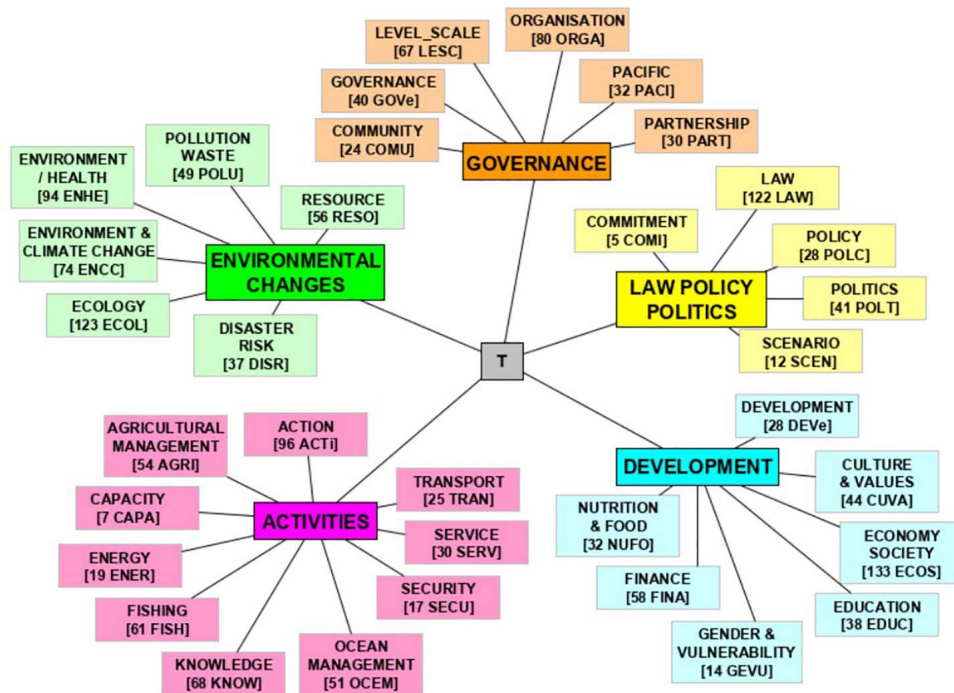
Step 1 is commonly performed in natural language processing (NLP) of textual corpora but it is not a fully automated process. It includes the homogenisation of texts (UTF08 encoding), the elimination of layout markers and references to figures, etc. For this reason, text tables have been omitted unless they presented useful information in textual form.

Step 2 uses algorithms for the automatic extraction of noun phrases. However, this extraction is a relatively complex task which requires in particular the parsing of the text into sentences, then their parsing into tokens (most of them being words), followed by a syntactic analysis making it possible to identify the noun phrases through the grammatical function they occupy in

**TABLE 1** | List of policies of the corpus.

| Label | General Issue and Publ. date | Policy   | # Count     | Cover (%) |
|-------|------------------------------|--|-------------|-----------|
| S01   | Ocean 2018                   | NOP: Solomon Islands National Ocean Policy   | 803 (1737)  | 97.1      |
| S02   | Development 2016             | NDS: Solomon Islands Government: National Development Strategy 2016 to 2035                    | 3424 (6857) | 100.0     |
| S03   | Biodiversity 2016            | BSAP: Solomon Islands: The National Biodiversity Strategic Action Plan 2016 – 2020             | 2489 (6253) | 100.0     |
| S04   | Tuna 1999                    | TMDP: Solomon Islands Tuna Management and Development Plan                                     | 650 (1162)  | 94.1      |
| S05   | Fisheries 2019               | NFP: Solomon Islands National Fisheries Policy 2019–2029                                       | 496 (792)   | 91.2      |
| S06   | Environment 2008             | ER: The Environment Regulations  | 159 (280)   | 76.5      |
| S07   | Climate Change 2012          | NCCP: Solomon Islands National Climate Change Policy: 2012 – 2017                              | 1717 (3206) | 97.1      |
| S08   | Waste 2017                   | WMPC: Solomon Islands Government: Waste Management and Pollution Control Strategy 2017 – 2026  | 2382 (4291) | 100.0     |
| R01   | Regionalism 2014             | FPR: Framework for Pacific Regionalism   | 105 (140)   | 64.7      |
| R02   | Ocean 2005                   | PIROP: Pacific Islands Regional Ocean Policy and the Framework for Integrated Strategic Action | 1217 (2149) | 100.0     |
| R03   | Ocean-scape 2010             | FPO: Framework for a Pacific Oceanscape  | 1852 (4423) | 100.0     |
| R04   | Development 2016             | FRDP: Framework for Resilient Development in the Pacific                                       | 1521 (3028) | 100.0     |
| R05   | Marine Litter 2018           | PRAP-ML: Pacific Regional Action Plan- Marine litter   | 600 (1106)  | 94.1      |
| R06   | Development 2017             | PRSD: Pacific Roadmap for Sustainable Development  | 377 (604)   | 76.5      |
| R07   | Sustainability 2016          | POS: Pohnpei Ocean Statement: A course to sustainability                                       | 123 (146)   | 76.5      |
| R08   | Ocean Future 2014            | PD: Palau Declaration on “The Ocean: Life and Future”  | 180 (223)   | 85.3      |
| R09   | Fisheries 2015               | SPF: Regional Roadmap for Sustainable Pacific Fisheries  | 238 (307)   | 85.3      |
| R10   | Blue Pacific 2017            | BP: Blue Pacific: Forum Communiqué   | 275 (432)   | 88.2      |

Labels beginning with an “S” (respectively an “R”) refer to policies of the Solomon Islands (respectively of the Pacific Region). Count column indicates the number of selected distinct expressions extracted from the policy text (in parenthesis: raw number of selected expressions, with duplicates). Last column gives the % of the 34 themes covered by the policy.



**FIGURE 1 |** Taxonomy built from the vocabulary of significant autonomous expressions extracted from the policy corpus. The total field of the taxonomy is partitioned in five domains – Activities, Development, Environmental Changes, Governance, and Law Policy Politics. Each domain is partitioned into themes which number of related lemmas (see text) and label are given into brackets (see the Annex for details).

each sentence. In order to ensure a good recall of this step, we use three free- or share-ware as detailed in the **Supplementary Material**. The lists of expressions produced by these three approaches are then merged into a single list, keeping both any nested expressions and the phrases into which they fit (e. g. “environmental impact assessment” is nested in “application of environmental impact assessment”).

This resultant single list is then analysed (step 3) to remove all expressions that have an indeterminate or too general meaning when they are detached from the sentences in which they were used. Reading them in a list, outside the textual context, does not allow to link them to a theme or policy sector (e. g. “annual growth rate,” “potential earnings”). After this lexical filtering, more than 13,500 distinct expressions endowed with an autonomous meaning (independent of the context), form the vocabulary of the corpus of 18 policies. Each expression or noun phrase is made up of one or more words.

A set of themes is then formed from the vocabulary. The approach chosen in this fourth step is based on the differentiated and complementary expertise of the co-authors to identify these themes rather than on a purely lexical-semantic analysis or a clustering statistic. In this way the identified themes are meaningful in the context of the making of policies and regulations related to the oceans and marine resources, socio-ecological changes and development, in particular in the specific context of the Pacific region. The 34 themes thus obtained were divided into 5 domains, “activities,” “development,”

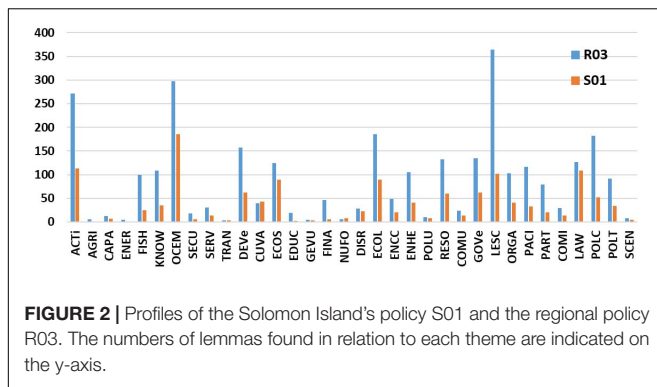
“environmental changes,” “governance,” and “law, policy, and politics” (see **Figure 1**).

In step 5 (see **Supplementary Material** for details), each word entering the composition of an expression of the vocabulary, except stop-words, is lemmatised. More than 3,800 of such lemmas were obtained and each lemma is then assigned to a theme. The hierarchy formed by the list of lemmas assigned to the 34 themes themselves partitioned into five domains. This constitutes the taxonomy of the corpus of policies analysed. By construction, an expression comprising several lemmas can be linked to more than one theme, for example, “advocacy for low carbon development” is related to the themes “law” [label: LAW], “environment and climate change” [ENCC] and “development” [DEVe] via the lemmas “advocacy,” “carbon,” and “development,” respectively. Acronyms and frozen expressions are not lemmatized but directly related to a theme.

The policy texts are taken one by one in step 6, to search for each expression. For each policy, the number of distinct lemmas assigned to each theme is counted. The presentation of this result in the form of a histogram constitutes the profile of policy. By way of example, the profiles of the similar policies S01 *Solomon Islands National Ocean Policy* and R03 *Framework for a Pacific Oceanscape* are presented in **Figure 2**.

Details of the definitions of the hierarchical taxonomy and further definition of the 34 themes are provided in the **Supplementary Material**.

To ease the comparison between these policy profiles a cosine measure of similarity is provided (e.g., Yearwood and Wilkinson,



1997; Graesser et al., 2000; see **Supplementary Material**) so that two policies presenting the same relative number of lemmas in the same themes will be of maximum similarity (cosine = 1). Two policies dealing with distinct themes will be of maximum dissimilarity (cosine = 0).

## Policy Networks and Clustering

Beyond the profiles of policies and the measurement of their pairwise similarity, further understanding of the interconnections between the policies and socio-environmental and development themes can be elucidated.

The counting of lemmas by theme was dependent on the identification of expressions and the assignment of the lemmas resulting from these expressions to a theme. This approach provided meaningful results for establishing the profiles of policies and was relevant for comparing them (having been built on the same mould). However, we wanted to establish a more robust policy network for analysis.

For this purpose, we now only consider the Boolean information indicating whether or not a theme was addressed by a policy. Note that the importance of a theme in a policy or in a regulation is not necessarily reflected by the number of expressions or lemmas that refer to it. A low number of term occurrences is sometimes the weak signal associated with the emergence of a new theme (Lajaunie and Mazzega, 2016; Lajaunie et al., 2018). On this basis, a non-oriented graph (network) was constructed as follows: each policy was a node to which the corresponding label was attributed (see **Table 1**); a link was established between the policies (nodes)  $P_j$  and  $P_k$  ( $jk$ ) if they addressed at least one same theme; a weight  $N_{jk}$  was assigned to the link between two policies which address the same  $N_{jk}$  themes.

This reduction from the information carried by the counting of lemmas by theme, to just the occurrence of themes in a policy, reinforced the robustness of network analysis while sacrificing its lexico-semantic finesse. Thus, as will be seen in Section “Results”, the graph produced in this way was complete. In other words, there was always at least one theme addressed by any pair  $[P_j, P_k]$ . To better understand the thematic articulation of all policies, we must therefore take into account the weights of the policies interlinkages.

The distance between  $P_j$  and  $P_k$  is defined as the inverse of the weight of their mutual links. In other words, the greater the

number of common themes that two policies address, the lower their distance. Considering all policy pairs, a dendrogram was built that showed which policies group together in clusters and how these clusters gradually merge into larger clusters with the increase in the distance tolerated for being part of the same cluster (see **Supplementary Material**, section “Materials and Methods”).

As with policies, it is possible to produce a graph whose nodes were themes linked in pairs when they were addressed by at least one and the same policy. Each link was weighted by the number of policies that address the two themes. An analysis of the strength of these interconnections was also carried out via the production of the dendrogram representing the clustering of themes as a function of their mutual distances.

## RESULTS

### National and Regional Policies

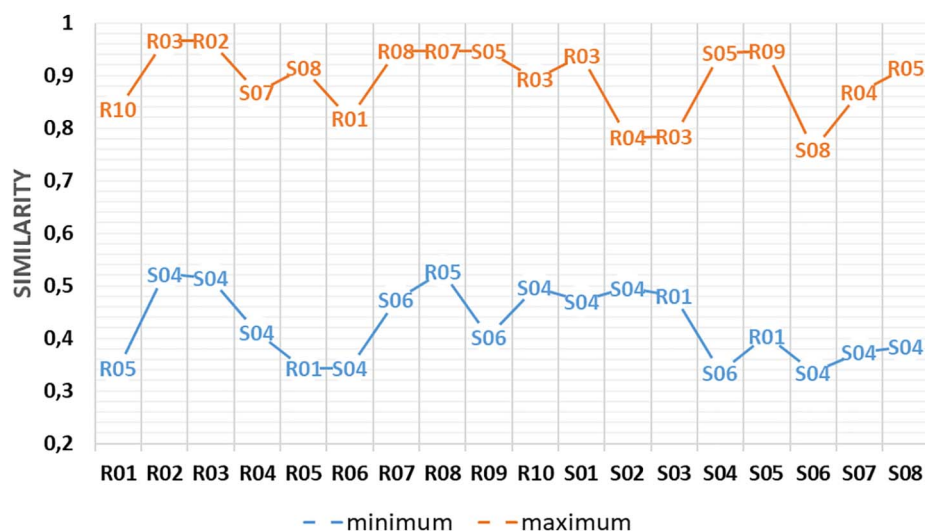
A total of 13,622 expressions, assigned to 1,826 lemmas, forming the 34 themes subsumed by five domains, were harvested from the national and regional policies (see domains and themes in **Figure 1**).

Each policy has been profiled (**Figure 2** shows some of them). Beyond the information provided by the analysis of each profile, their comparison gives indications on the similarity of their treatment of the various themes. **Figure 3** indicates, for each policy, the most similar policy and the most dissimilar policy. The maximum and minimum similarity scores are clearly distinct for all policies, which expresses important differences in the balance given to the various themes in the different policies. If we consider the Solomon Islands policy group on the one hand, and the regional policy group on the other hand, it is notable that several policies find in the other group the most similar policy, or on the contrary the most dissimilar one. The similarity of the distribution of lemmas by topic is often more prominent in the other policy group. In other words, there is no clear and consistent differentiation between national and regional policies.

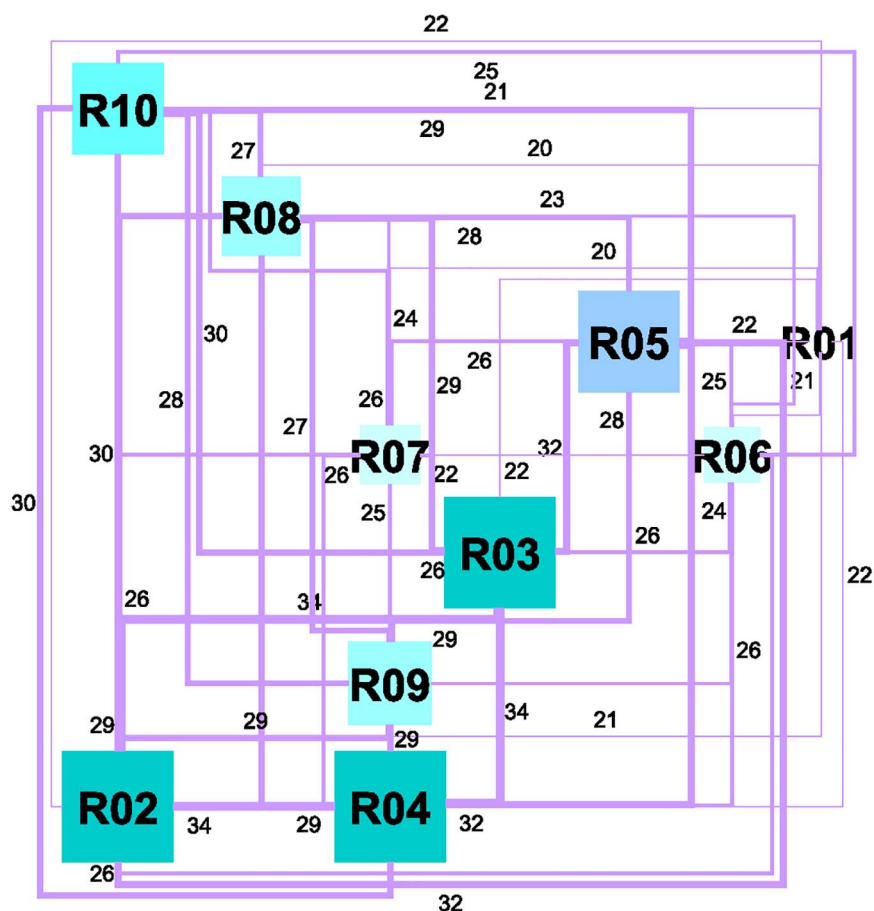
For example, the similarity measure for policies, which profiles are shown in **Figure 2**, indicates that ocean policies S01 and R03 are very similar, whereas S04 on the contrary is, among the 16 other policies, the most dissimilar from S01 and R03.

### National and Regional Policy Networks

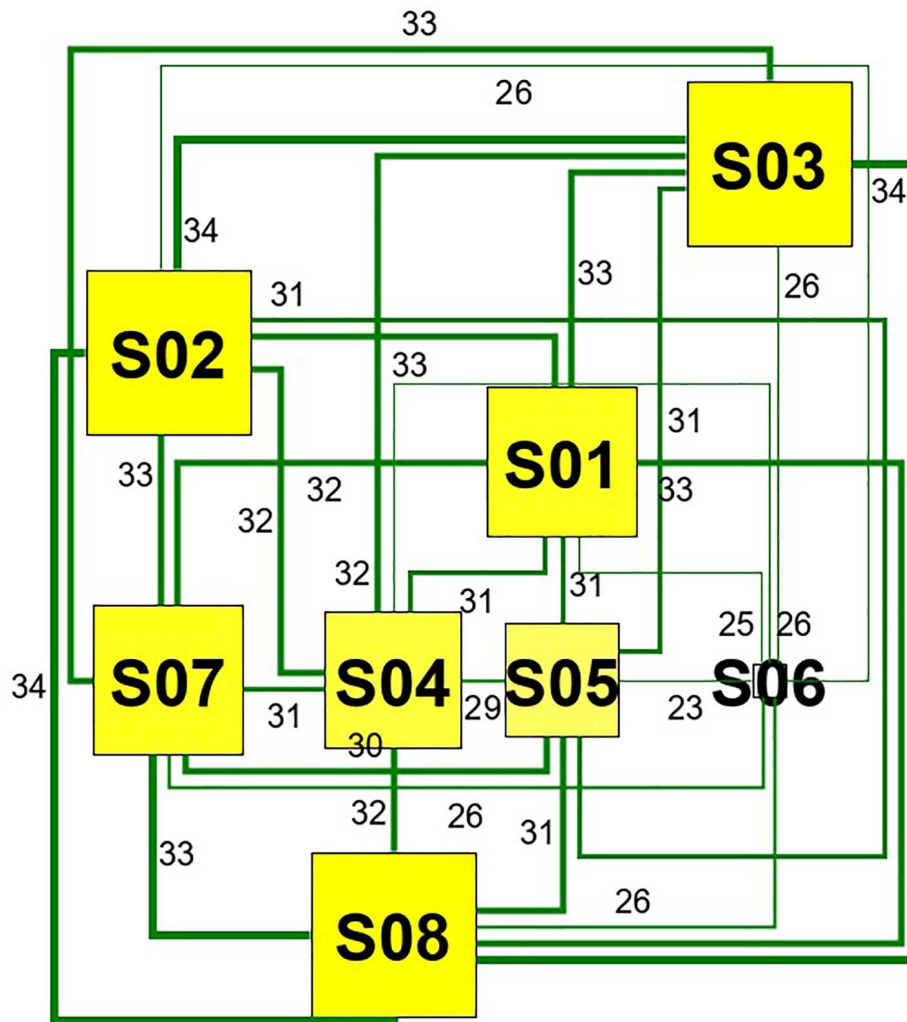
Beyond the similarities of policies, the information permitted an analysis of the interlinkages between the national policies and regional policies, to be undertaken. For regional policies the most interlinked policies were PIROP (R02), FPO (R03), and FRDP (R04) (**Figure 4**). These three regional policies displayed a shared use of all 34 themes. The PRAP-ML (R05) is also strongly linked to this triad but two themes are not shared, the “capacity” and “energy” themes. The BP (R10) policy is even less connected with the triad, sharing 30 themes with the policy triad and 29 with the PRAP-ML policy. POS (R07) and PRSD (R06) were moderately linked to other policies, however, FPR (R01) was weakly connected to most regional ocean-related policies, suggesting differential narratives between regionalism and the Ocean.



**FIGURE 3 |** The highest (top orange curve) and lowest (bottom blue curve) cosine-similarity (value on the y-axis) with other policies of each policy named on the x-axis (see **Table 1** for the policy labels).



**FIGURE 4 |** Interlinkages between regional policies. Each box represents a policy indicated by its label. Two policies are linked if they both address the same N themes (N being the weight indicated on the links); links with higher weights are thicker, and lines with weights < 20 are not labelled. Box size is related to the sum of the weights of its links.



**FIGURE 5 |** Interlinkages between Solomon Island policies. Each box represents a policy indicated by its label. Policies are linked if they both address the same N themes (N being the weight indicated on the links); links with higher weights are thicker. Box size is related to the sum of the weights of its links.

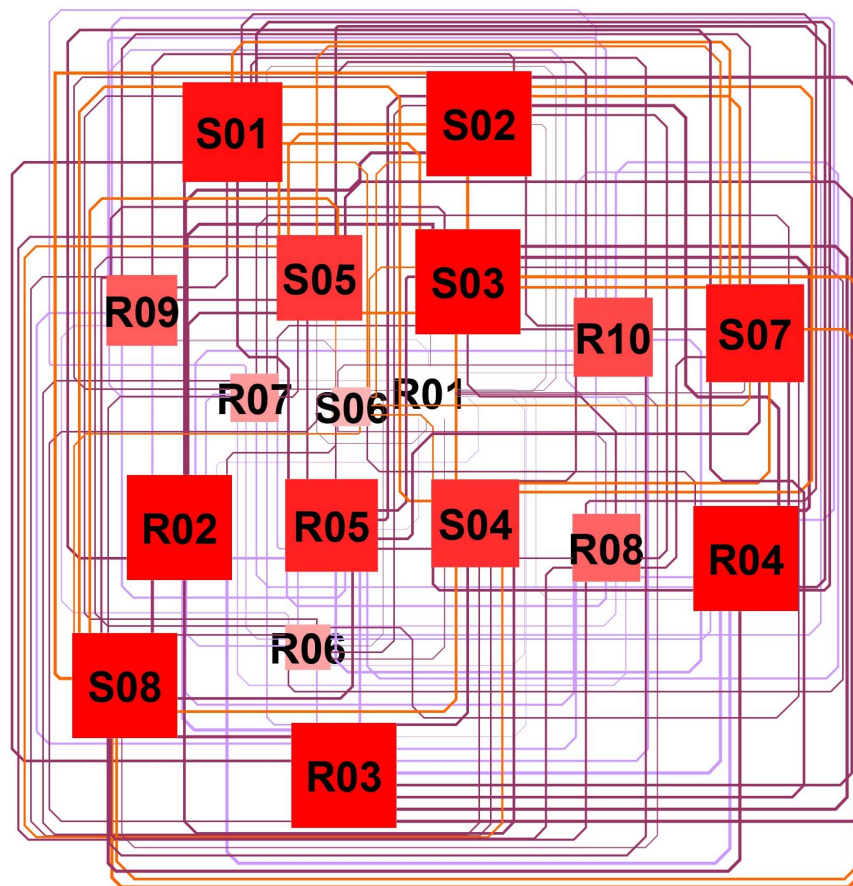
The Solomon Islands ocean-related policies provide a general picture of strong interlinkages between most policies (Figure 5). Another triad stands out here with maximum connectivity between policies NDS (S02), BSAP (S03), and WMPC (S08); each of these three policies take into account all the 34 themes. The NOP (S01) and (NDS) (S02) are well connected to most of the other policies, suggesting that aspects NDS published in 2016 are embedded within the NOP of 2018. Tuna, fisheries and climate change (S04, S05, S06, respectively) are also well connected to the NOP and NDS, suggesting good coherence. However, ER (S06) is poorly linked to other ocean-related policies, suggesting limited inclusion of the identified ocean-related expressions.

### Integration of National and Regional Policy

Combining regional and national policies we see a degree of integration at theme level (Figure 6). The regional triad (R02 – 4) as well as the Solomon Island's triad of policies (S02-3, S08)

appear on the diagram as large boxes due to the high amount of links (the addition of the other group of policies does not change the links and weights presented in Figures 4, 5). Each policy of each of two triads deals with 34 themes, thus the connection between each component of the two triads is also necessarily maximum. The national policies of S04 (TMDP), S05 (NFP), and S07 (NCCP) are also strongly linked to regional triad sharing > 30 themes. This initial interpretation suggests that the regional triad and a majority of the national policies are so closely interlinked they are largely overlapping at the theme level.

Lower levels of theme interlinkages are in fact found in other regional policies including PRSD (R06), POS (R07) and PD (R08) which are weakly linked to the regional triad, the main Solomon Islands group, and also each other. However, most notable is the Framework for Pacific Regionalism (FPR; R01) which is weakly linked to most other policies (small size of box in Figure 6). The Blue Pacific Communique (BP; R10) has a medium level of linkage to other policies overall, however, it has the lowest level



**FIGURE 6 |** Network of the regional and Solomon Islands policies. Policy nodes with higher level of interlinkages are larger; links with higher weights (not shown) are thicker. Regional to regional (resp. Solomon Islands to Solomon Islands) policies are in light purple (resp. orange); links between regional and Solomon Islands policies are in dark violet.

of linkage to FPR (sharing just 21 themes) of all studied national and regional policies.

Preliminary interpretation of national and regional policy nexus suggests that the NOP (S01) is well aligned to the NDS (S02), but it is also highly linked to a group of existing national ocean-related policies. Consequently, the NOP is not providing increased or differential policy dimensions to those that already existed in sector-based ocean policy. The NOP, along with its allied national ocean policy cluster, is closely related to the regional triad (PIROP, FPO, and FRDP; R02 – 4), this group shares a high level of themes between them with little differentiation. BP (R10) shares medium levels of connectivity with the regional and national collective group. Finally, FPR (R01) has limited connection to any policy, suggesting that regionalism dimensions are not embedded in regional or national ocean policies, including the Blue Pacific (R10).

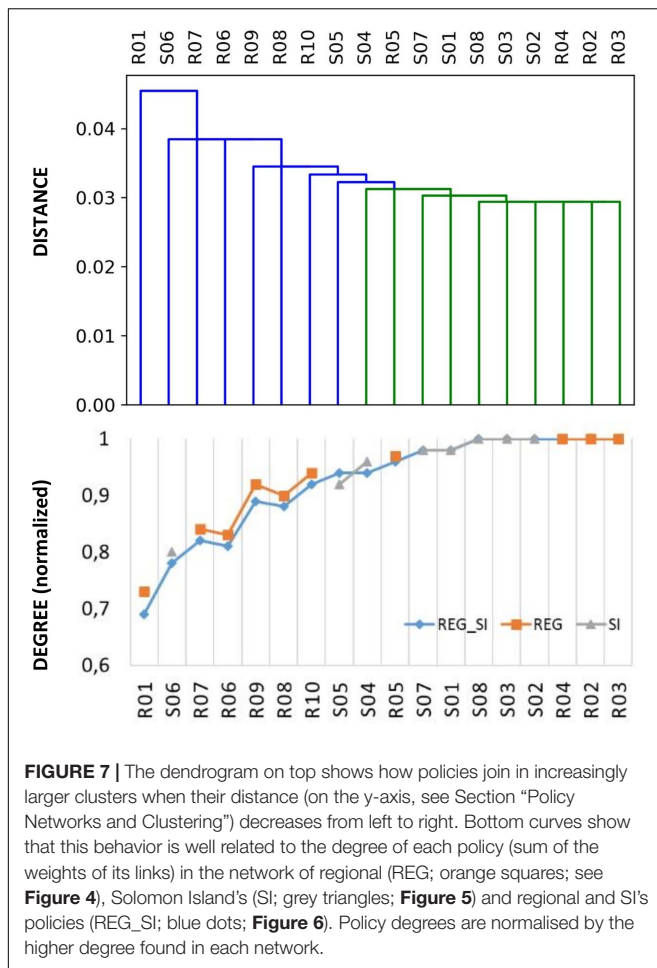
## Deconstructing the Policy Nexus

To move to a more structured basis for deconstructing the policy nexus, a dendrogram was constructed (Figure 7, top diagram), which shows how some policies gather in clusters

when the distance tolerated between policies increases. The first (and single) cluster formed appears at the right most of the dendrogram; it gathers the six policies, formed from the regional policy triad, of FPO(R03), PIROP(R02), and FRDP (R04), with NDS (S02), BSAP (S03), and WMPC (S08) of the Solomon Islands. Each of these policies develop the full set of 34 themes, as shown on Figure 7 bottom panel. Therefore, taken by pair they have the minimal distance and form the most central<sup>2</sup> and robust set of policies in our corpus.

The National Ocean Policy (NOP – S01) and climate change (NCCP – S07) policies also show a strong connectivity – sharing 33 themes – with the previous central set. In the middle there is a combination of sectoral (marine litter PRAP-ML R05, tuna TMDP S04, then fisheries NFT S05, and fisheries SPF R09) and more integrated policies (Blue Pacific BP R10, ocean future PD R08) from both regional and national sources. Even weaker links (increasing distances) are found with the regional PRSD (R06 development) and POS (R07 sustainability) policies, and the national regulations ER (S06 environment). Again, FPR (R01) has

<sup>2</sup>This qualifier should not be taken here with the operational meaning of graph theory, but with an institutional meaning.



highest distance suggesting that ocean policies are not capturing regionalism as laid out in FPR.

The whole dendrogram demonstrates that there are not several clusters separated from each other but rather policies which cover an increasing number of themes (when reading Figure 7 from left to right). This explains the incremental monotonic growth of policies (Figure 7 bottom), which are homothetic to the persistence of a single cluster (Figure 7 top). This thematic interlocking of policies does not distinguish between regional policies on the one hand and national policies on the other.

## Key Ocean Constructs

The prior analysis has provided results on the distances and similarities between national and regional policy instruments. This section analyses the various ocean constructs, or themes, that are used within the policies. The interlinkages between themes form a complex array with some themes being highly linked and other weakly linked (Figure 8). The node size can be small when there are minimal interlinkages, for example with energy and agriculture, but also with capacity and education. Alternatively, highly linked nodes are interlinked to nearly all other nodes, such as health of the environment and knowledge.

Figure 8 shows that a few themes are poorly linked to the other themes in regional or national policies. They concern important policy sectors: Energy, Transport, Agriculture, and Pollution and Waste. Additionally, they also refer to means to reach the objectives of the policies through Capacity Building and Education (two of the 34 themes illustrated by Figure 8 under the CAPA and EDUC labels).

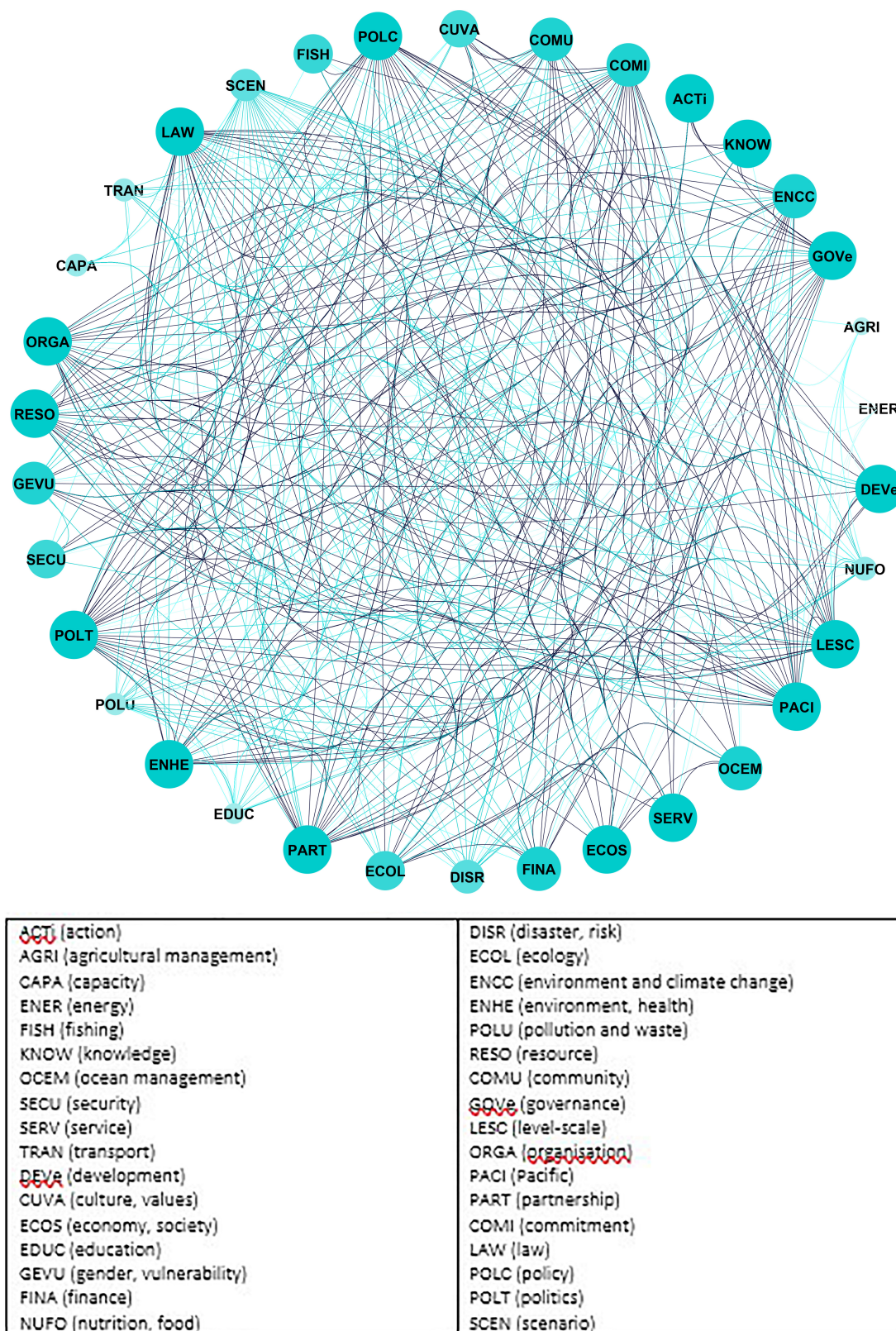
This limited connection could be explained by various factors. First, these specific themes are addressed mainly by sectoral policies as in the case of waste and pollution national policy WMPC (S08) or the Pacific Regional Action Plan-Marine litter (PRAP-ML R05). Energy, Transport, Nutrition and Food or Education are considered together under the head title “Development sectors” in the Framework for Resilient Development in the Pacific (FRDP R04). Second, these themes might be discussed in other political arenas and they are to be taken into account by UN agencies such as the International Maritime Organisation (IMO) for transport or UN ESCAP – which the secretariat has been requested by member States to facilitate the dissemination and exchange of information by “increasing the coherence and availability of energy statistics and policy-related information.”<sup>3</sup> when it comes to Energy. The themes Nutrition and Food concern various political sectors which may result in cross-sectoral tensions among policymakers and stakeholders such as between the food industry on the one hand and the health sector on the other hand (Dodd et al., 2020). Nevertheless, while the population in Solomon Islands rely heavily on agriculture and small-scale fisheries as the main sources of food and income (Keen et al., 2018), the lemma “agriculture” does not appear once in the NOP (S01). It can be explained by the fact that the NOP refers to a more integrated objective “Ensure sustainable food and nutritional security.” More generally, it indicates that it is crucial to use an iterative process to integrate complex scientific knowledge into policies in order to formulate truly integrated policies.

However, interrogating such networks along specific dimensions are necessary to extract conclusions from such entanglements. The previous analysis has showed that there is a commonality between many oceans related national and regional policies, but this analysis focusses on differentiation between national and regional policies. To do this analysis required accessing more detailed information at the sub-theme level from the lemmas.

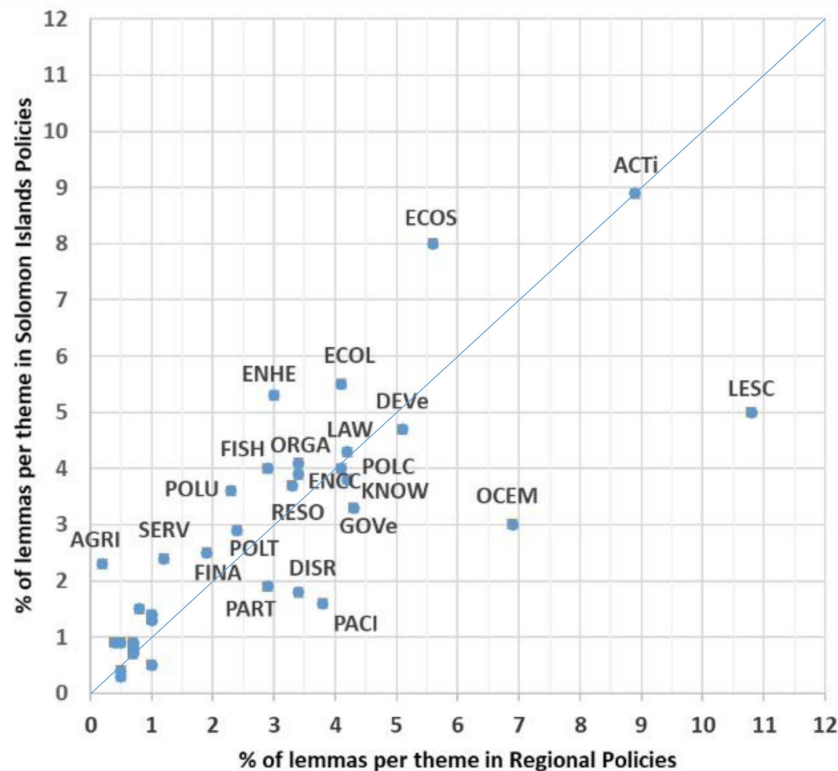
If national and regional policy use a similar number of lemmas of each theme, then there is evidence that the importance of the theme is similar between the national and regional policy. If, however, regional policy uses many lemmas under the theme, but national policy uses only a few then the proportion of lemmas, then it can be construed that the regional policy has developed that theme more strongly than the national policy. In this analysis we compare the proportion of lemmas used for each of the 34 themes separately for national and regional policy (Figure 9).

Themes which are above the line of parity have a higher proportion of lemma use in national policies than the regional

<sup>3</sup>Through the Asia Pacific Energy Portal <https://asiapacificenergy.org/> consulted on the 28/02/2021.



**FIGURE 8 |** Network of the 34 themes. Each node represents a theme indicated by its label. Two themes are linked if they are both addressed by the same N policies (N values not shown). The ball size is related to its level of linkage (defined as the sum of the weights of its links); with higher weights being represented as darker shading. Theme summary description in table below, for further detail and description of lemmas in each theme see **Supplementary Material**.



**FIGURE 9 |** Percentage of lemmas dedicated to each theme in regional policies (x-axis) and Solomon Islands policies (y-axis). Equal percentage of lemmas about the same theme in regional and national policies align to the diagonal line or parity. The themes above the diagonal are more developed in Solomon Island policies, whereas those below are more developed in regional policies. Labels of themes below 2% limit on both axes are not given for the readability of the figure (i.e.) CAPA, ENER, SECU, TRAN, CUVA, EDUC, GEVU, NUFO, COMU, COMI, SCEN.

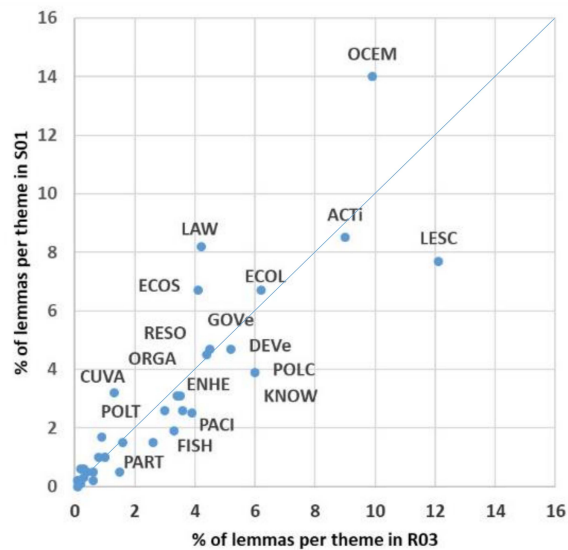
policies. Thus, economy and society (ECOL), environment – health (ENHE), ecology (ECOL), and fishing (FISH) are stronger developed in the national policies as compared with regional policies. On the other hand, themes below the line of parity are more strongly espoused in regional policies and include level and scale of decision making (LESC), ocean management (OCEM), Pacific (PACI), and partnership (PART). Analysis at this scale provides clear differentiation between national and regional policies *en masse*.

Restricting the lemmas to those used by two anchoring policies of national and regional scale (NOP, S01; and FPO, R03) frames the other policies by their proportion use of lemmas in those two selected policies (**Figure 10**). In this case the themes such as OCEM, law (LAW) and ecology and society (ECOS) are more strongly developed in national policies compared to FPO. Whereas LESC, policy (POLC) and knowledge (KNOW) are more strongly developed in regional policies compared to NOP.

The juxtaposition of OCEM from being on the regional side of parity when compared with national and regional policy (**Figure 9**), but on the NOP side of a line of parity with FPO (**Figure 10**), suggests that there has been an evolution. With the NOP of 2018 more strongly taking on elements of ocean management, and also ecology and society and law than the FPO itself.

These analyses have also uncovered a consolidation among policies, including:

- i. Considerable homogeneity between the regional triad of policies (FPO, PIROP, and FRDP) and many of the national policies. In terms of use of constructs the regional triad were similar to national policies but just having regional coverage.
- ii. Slightly different were a suite of sector policies but these were largely undifferentiated between national or regional policies. Such regional sector policies (e.g., litter, R05 and fisheries, R09) seemed to be similar to national sector policies but, again, just having regional coverage.
- iii. Regionalism, *sensu* the FPR (of 2014; R01), has been shown to have little connection to both national and regional policies related to the ocean. Through the lens of ocean-related policy, regionalism is a largely absent narrative. However, the Blue Pacific Communique of 2017 seems to partially bridge the gap between ocean policies and regionalism.
- iv. The intense overlapping of regional and national policies does not seem to provide required synergies; themes tend to be repetitive rather than synergistic. The NOP of 2018 has largely captured and consolidated policy



**FIGURE 10 |** Percentage of lemmas dedicated to each theme in the Framework for a Pacific Oceanscape (R03; x-axis) and National Ocean Policy (S01; y-axis). Equal percentage of lemmas about the same theme in R03 and S01 align to the diagonal line of parity. The themes above the diagonal are more developed in S01, whereas those below are more developed in R03. Labels of themes below 2% limit on both axes are not given for the readability of the figure.

elements of prior national and regional policies, but there is little evidence that it has created new policy space. Indeed, PIROP and NOP share 33 of the 34 themes, although they are produced 13 years apart (2005 and 2018, respectively); this suggests limited ocean policy evolution. For the Solomon Islands the constructs of the NOP suggest that it is largely a consolidation of national and regional policies rather than a new direction in ocean management and governance.

## DISCUSSION

The global marine system has been in decline from multiple anthropogenic pressures including overfishing (Food and Agriculture Organization of the United Nations (FAO), 2018), destruction of marine ecosystems (United Nations General Assembly (UNGA), 2017) and marine litter (Secretariat of the Convention on Biological Diversity (CBD), 2012). The World Ocean Assessment stated that human pressures impact the ocean in complex and cumulative ways, especially from failure to deal quickly with these multiple problems (United Nations General Assembly (UNGA), 2017). The United Nations General Assembly adopted a Resolution in 2015 on “Oceans and the Law of the Sea” (A/RES/70/235) which specifically recognised the importance of Small Island Developing States (SIDS) which tend to rely heavily on marine resources but have high levels of vulnerability (Article 267). “Transforming Our World: the 2030 Agenda for Sustainable Development” and the associated

Sustainable Development Goals (SDGs) (United Nations General Assembly (UNGA), 2015; United Nations, 2017) were premised on addressing the interlinked and indivisible dimensions of sustainable development (economic, social, and environmental) in a holistic and coordinated way (Nerini et al., 2018; Singh et al., 2018). Pacific SIDS undertook a diplomatic campaign to promote international commitment for an ocean-based SDG (now SDG 14), recognising themselves as global ocean guardians (Quirk and Hanich, 2016).

Beyond the international stage policy initiatives have also been progressing at the regional and national scales. For the Pacific, the Blue Pacific Regional Ocean Report (2021) is the first attempt at the regional level to compile a comprehensive, multi-faceted, cross-cutting and holistic review, and stock take of the state of affairs of ocean governance in the region. The conclusion from the BPOR is that progress on implementation has been a mixed but to maintain the oceans health, productivity and resilience requires a cross-sectoral, cooperative, and integrated approach in governance and implementation of plans, activities and measures. However, with the BPOR as a backdrop to the Solomon Islands analysis presented in this work, we find multi-decadal policy development at the national and regional level has largely homogenously and convergently evolved.

At the regional level we find maximum similarity between a triad of policies (PIROP, R02; FPO, R03 and FRDP R04) which were produced from 2005 (PIROP) to 2016 (FRDP). The upshot is that there has been a notable lack of emergence of new policy objectives over this period and even regional sector policies had a medium to high degree of similarity to this regional triad. These policies have developed with thematic interlocking and thus in a largely monotonic way, by way of analogy more akin to cloning or budding.

The analysis presented here demonstrated that the Solomon Islands NOP has a very close allegiance to FPO (and thus PIROP, and FRDP), and also to other national sector-based ocean policies. According to Vince et al. (2017), PIROP was actually envisaged “as a template for the PICTs to adopt and adapt in the development of national policy, reflecting the range of interests, priorities and capacity within the region.” The NOP thus consolidates existing national and regional policy instruments rather than extending or evolving them. In terms of policy content, the NOP in terms of content does not seem to meet the transformative call of the 2030 Agenda for Sustainable Development or regional leaders, such as through the Pohnpei Ocean Statement (POS, R07). However, the collaborative *Ocean 12* approach of cross-government working on policy development and implementation, and institutional arrangements set up to facilitate this, may initiate a transformation of ocean management. The NOP states that “more detailed guidance of implementation of this policy will be forthcoming,” so the extent to which the more integrated institutional architecture can deliver in term of implementation will take number of years to determine. With the NOP oversight role mandated to the Ministry of Foreign Affairs and External Trade, the development of the NOP Action Plan, which must find a compromise between conflicting interests, is an important next stage for “keeping the wheels turning” (Keen and Masu, 2019).

Some regional policies were distinguishable from the FPO – NOP nexus. The Framework for Pacific Regionalism (FPR, R01) is relatively dissimilar to all policies (see for example **Figure 4**). But the vitalness of the Ocean to the identity of the region as extolled by Hau'ofa in his seminal article *Our Sea of Islands*, does not seem to come out through the FPR. Indeed, the FPO – NOP approach to the ocean from a social- and enviro- centric standpoint, includes few elements about identity and regionalism in the sense of FPR. Increasingly, the broader role of the ocean in multidimensional security and geopolitics is becoming apparent. In contrast the Blue Pacific: Forum Communique (BP, R10) forms a connection with the FPR well as the homogeneous FPO – NOP nexus. The “Blue Pacific” identity is the core driver of collective action to advance the Leaders’ vision under the Framework for Pacific Regionalism and regional priorities such as ocean management and conservation, fisheries, resilience, regional security, and sustainable development. However, as stated in the BPOR, “our ocean custodianship identity lives only through a paper-trail of declarations” and there is a need to revitalise this (OPOC, 2021). BP is thus set out as more of a bridging policy.

Wright et al. (2017) note the usefulness of tailor-made and context-specific regional partnerships for sustainable management, especially for harmonised implementation across SDG14 targets and other ocean related SDGs. Ocean policy has been largely focussed on place-based attributes of natural and non-living resources and socio-economics (Aswani and Hamilton, 2004; McCarter et al., 2018), permitting harvesting and exploitation, balanced by protectionist regimes for biodiversity (OECD, 2020). This ocean view was not brought into the Pacific regionalism narrative, even though it connected the aforementioned Sea of Islands. The Blue Pacific narrative would seem to act more as a bridging policy which links into identity and broader governance and power issues, but also recognises the reliance and resource base of the ocean.

The broader conclusions of this paper challenge the norm of viewing policies at different levels. In the case of the Solomon Islands, national policy has actually increasingly merged with regional policy, through a form of convergent evolution. This has led to minimal differentials between national and regional policy and maybe has constrained the required transformations demanded by Agenda 2030. New directions which build on this merged nexus only arrived through the Blue Pacific Communique in 2017. By way of analogy, the ocean orchestra may have an increasing number of conductors, but they all beat at the same tempo; only by adding a conductor beating at a different tempo does the harmony become disrupted and change.

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## DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## AUTHOR CONTRIBUTIONS

JH initially conceived the study, but the research was designed jointly by all authors. PNM and JH undertook policy selection and PM, CL, and PNM extracted policy texts. Methodology and computer codes were designed and developed by PM. Data analysis and visualisation was predominantly carried out by CL and PM. All authors contributed to drafting of the manuscript as well as multiple revisions. All authors approved the submitted version.

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## SUPPLEMENTARY MATERIAL

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# Scoping Science-Policy Arenas for Regional Ocean Governance in the Wider Caribbean Region

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This paper explores the diversity of relationships that exist between science and policy and which underpin the uptake of science in oceans policy-making in the Wider Caribbean Region (WCR). We refer to these complex relationships, influenced by organizational culture and environments, as science-policy arenas. The paper examines the types of decisions that require science input, where the decision-making responsibility lies, who the science providers are, and how science gets translated into advice for a suite of 20 regional Intergovernmental Organizations (IGOs). The picture that emerges is one of a diverse suite of well-structured and active science-policy processes, albeit with several deficiencies. These processes appear to be somewhat separated from a broad diversity of potential science inputs. The gap appears largely due to lack of accessibility and interest in both directions (providers <-> consumers), with IGOs apparently preferring to use a relatively small subset of available expertise. At the same time, there is a small number of boundary-spanners, many of which are newly emerging, that carry out a diversity of functions in seeking to address the gap. Based on our scoping assessment, there is an urgent need for actors to understand the networks of interactions and actively develop them for science-policy interfaces to be effective and efficient. This presents a major challenge for the region where most countries are small and have little if any science capacity. Innovative mechanisms that focus more on processes for accessing science than on assembling inventories of available information are needed. A managed information hub that can be used to build teams of scientists and advisors to address policy questions may be effective for the WCR given its institutional complexity. More broadly, recognition of the potential value of boundary spanning activities in getting science into policy is needed. Capacity for these should be built and boundary spanning organizations encouraged, formalized and mainstreamed.

**Keywords:** boundary-spanning, science producers, science consumers, regional institutions, information hubs

## INTRODUCTION

This paper scopes the science-policy arenas involved in regional ocean governance in the Wider Caribbean Region (WCR). It builds on a study by McConney et al. (2016a) that explored factors affecting the uptake of science in policy making. The purpose is to illustrate, for an ocean region, the diversity and complexity of actors and processes with which any actor seeking to promote or improve the uptake of science in policy making in this region must cope. This descriptive

elaboration is considered to be an essential precursor to deeper understanding of science-policy interfaces in the region and to developing approaches to improving uptake (Ostrom, 2010). There is increasing recognition of the role of regional organizations in achieving effective governance of the global oceans, and of the importance of building regional processes that have access to and make use of 'best available scientific evidence' (BASE) (Wright et al., 2017; IASS et al., 2020). However, other than the study by McConney et al. (2016a), we know of no other systematic attempt to elaborate a picture of science-policy arenas for ocean governance at the regional level. In our view, such studies are needed to develop a perspective of what is required to improve use of BASE at the regional level for global ocean governance.

The principle that decisions regarding conservation and management of living marine resources should be based on BASE is enshrined in the UN Convention on the Law of the Sea (UNCLOS) (United Nations, 1982). Countries and their regional organizations are legally obligated to operationalize this principle. Consequently, it has become well established in national, regional and global management policies and agreements. Even with the best intentions, managers have found many challenges to developing, obtaining and using BASE (Wolters et al., 2016). These range from low capacity to produce or access relevant scientific evidence, through poor communication of science to decision makers, to governance processes that are poorly or inadequately structured for the uptake of scientific advice (UNEP, 2017). The problem of linking science and policy for ocean governance has been extensively discussed in the literature for decades (e.g., Rice, 2005; Watson-Wright, 2005; Chilvers and Evans, 2009; MacDonald et al., 2016; Schumacher et al., 2020). Recently, the adoption of ecosystem based approaches to management which require a wide diversity of information for operationalization has resulted in renewed attention to this issue (Rice et al., 2014; Borja et al., 2016; Fanning et al., 2021a).

Developing countries and regions, particularly those with small islands developing states (SIDS) are particularly affected by the above challenges. The WCR is one such region in which the role of science in policy making has been noted as weak (Mahon et al., 2011; CLME+ Project, 2011; Deane and McConney, 2011; McConney et al., 2016a). Consequently, the Caribbean Large Marine Ecosystem Strategic Action Programme (CLME+ SAP) includes a strategy to promote the uptake of science in management for the sustainable use of living marine resources in the region (Debels et al., 2017). The importance of this strategy has been reemphasized in the development of a regional coordination mechanism (CM) for the WCR which has strengthening science-policy interfaces as one of its functions (CLME+ Project, 2019).

The regional institutional context for governance of marine ecosystems in the WCR is complex (Chakalall et al., 1998; Fanning et al., 2009; Mahon et al., 2014; Cooke, 2017). It comprises a suite of regional and subregional intergovernmental and non-governmental arrangements<sup>1</sup> that

<sup>1</sup>The term arrangement refers to an agreement and the organs and processes established to give effect to it.

includes sectoral organizations (fisheries, pollution, biodiversity, etc.), multipurpose economic integration organizations and supporting organizations (academia, science and technology). The effective functioning of these arrangements is highly dependent on technical inputs from, and implementation at, the national level. Consequently, the importance of interfaces between national and regional levels has frequently been noted (McConney et al., 2016a). A multistakeholder consultation on marine ecosystem-based management (EBM) for the WCR that included representatives from academia, regional IGOs, Non-governmental organizations (NGOs) and national governmental departments identified use of BASE as the second most important principle for EBM after participation (Fanning et al., 2011). Additionally, that consultation identified strengthening science-policy interfaces as critical for marine EBM in the WCR.

Clearly there is wide agreement that effective science-policy interfaces have a key role to play in promoting the use of BASE in ocean governance policy making in the WCR. However, in a region as complex as the WCR with ocean governance comprising a multi-organizational, multilevel system of arrangements (Mahon et al., 2010, 2014; Mahon and Fanning, 2019b; Degger et al., 2021), a key component to understanding the diversity of science-policy arenas, their structure and how they operate is to unpack the complexity of the system. As pointed out by Ostrom (2010) and Jordan et al. (2018), unpacking complexity is an undervalued step in the process of understanding and prescribing ways of improving a system. We believe that this unpacking is a necessary and valid step for assisting with the uptake of BASE in ocean governance decision making in the WCR and may also be instructional for other regions of the global ocean. We believe that the literature on science-policy interfaces, including boundary spanning, provides a valuable lens through which to approach this task. We first provide a brief conceptual overview of the components of a science-policy arena, the types of actors involved and their roles. Using the Large Marine Ecosystem (LME) Governance framework as a conceptual basis for multilevel ocean governance processes and interactions (Fanning et al., 2007), we then assess 20 key regional ocean governance arrangements within the WCR in terms of their type, origin and mandate. This scoping contributes to unpacking the complexity within the WCR by providing a broad perspective on where the decision-making responsibility lies, who the science providers are, and how science for ocean governance gets translated into advice in the WCR. We conclude with a reflection on brokering/boundary-spanning roles and approaches to strengthening these.

## DIMENSIONS OF SCIENCE-POLICY INTERFACES

### Conceptual Basis

This section provides a perspective that underpins the exploration of the science-policy arenas for ocean governance in the WCR. van den Hove (2007) defines science-policy interfaces as "...social processes which encompass relations between scientists and other actors in the policy process, and which

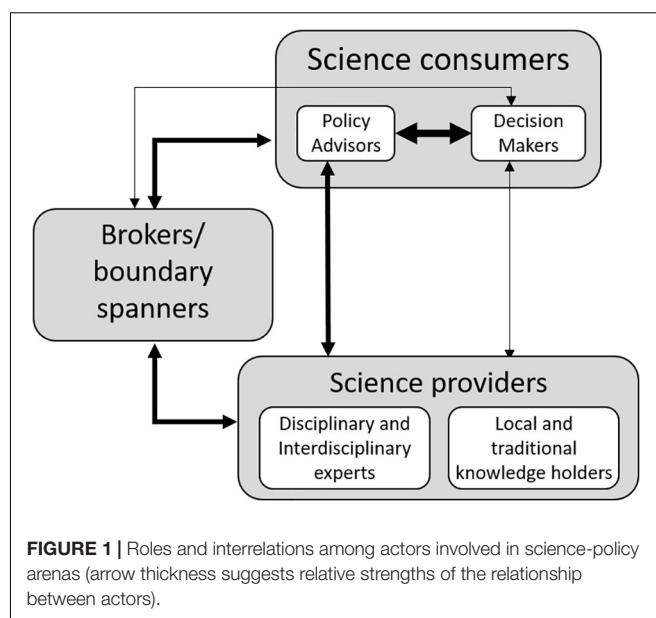
allow for exchanges, co-evolution, and joint construction of knowledge with the aim of enriching decision-making.” (p. 815). Consistent with this definition is the perception of science-policy interfaces as networks of all the actors engaged in a particular science-policy arena (McConney et al., 2016a). Sarkki et al. (2020) refer to these networks as ‘meshworks’ and emphasize the need to understand and facilitate them. Hartley (2016) promotes a similar view and emphasizes the potential role of network analysis in understanding connectivity between science and policy. These studies underscore the reality that the relationship between science and policy is much more complex than just an interface between two entities. Consequently, in this paper the entire science-policy system for an issue is referred to as a science-policy arena.

It is also necessary to recognize that in governing, there are different levels of policy making - strategic policy, planning and operational - that will require science inputs (Fanning et al., 2013). The actors, the questions to be addressed and types of input will differ among these levels. In a multilevel, multi-organizational regional system, these processes may take place at different levels, namely local, national, subregional regional and global. In a regional perspective, the global level may be considered an externality, but may still be a major influencer of the structure and function of science-policy interfaces at regional and subregional levels. For example, many regional organizations are sub-bodies of global organizations, especially within the UN system (Mahon and Fanning, 2019b). At the same time, the national level may be so closely integrated into the regional level that it may even be difficult to identify policy processes that operate entirely at the regional level (McConney et al., 2016a).

In many instances policy-making pertaining to a single issue will cut across two or more levels (Fanning et al., 2013). For example in the case of managing a fishery, the overarching policies may be set at the global level by the United Nations Food and Agriculture Organization (FAO) Code of Conduct agreed upon at the FAO Commission of Fisheries (COFI). These policies are then translated to regional policies within regional economic integration organizations and regional fisheries organizations. The latter may then convert these policies into regional management plans at geographical scales appropriate to the resource distribution. Finally, in most cases the decisions for operational planning for enforcement, and data collection are taken at the national or even local level, and also require science/technical input. Fanning et al. (2013) provide more detailed examples of such multilevel policy-interfaces. Effective interoperation of these processes requires linkages among the various levels of the regional governance system and may even require a regional cooperation mechanism (Fanning et al., 2007; CLME+ Project, 2019; Mahon and Fanning, 2019a).

## Roles in Science-Policy Arenas

To simplify the exploration of science-policy arenas, it is convenient to consider various categories of actors and their diversity (MacDonald et al., 2016; UNEP, 2017; Gluckman, 2018). In this study, three categories of actors are proposed: science consumers, science providers, and science-policy brokers/boundary-spanners (Figure 1). However, as pointed



out by Bednarek et al. (2018) within a science-policy arena for a particular issue, several individuals may play the same role, and/or some individuals may play more than one role.

## Science Consumers

Consumers of coastal and marine science are of two broad types ‘advisors’ and ‘decision-makers.’ Advisors are usually the primary users with whom the research providers and brokers/boundary spanners engage. They weigh the technical advice together with other factors such as feasibility, competing interests and broader societal values to formulate the final advice. Ultimately, the decision-makers merge the advice with their own suite of factors before reaching final policy conclusions (Gudmundsson, 2003). It is important for scientists to understand that their input is usually only one of several factors influencing policy decisions, otherwise they may develop a negative view of the process and become disinclined to participate (Singh et al., 2014; MacDonald et al., 2016). On occasion, the providers and/or brokers may engage directly with decision-makers (Figure 1). It is also useful to note that regional level science advisors may formulate advice for input to decision making processes at global, regional and national levels. Serving the needs of these diverse science consumer processes at multiple levels will present advisors with challenges in formulating advice appropriately.

## Science Providers

Ecosystem based management (EBM) of ocean ecosystems requires a wide range of disciplines: biogeophysical sciences (e.g., geology, biology, ecology, physics, chemistry), social sciences (e.g., political, economic, social), legal studies, management studies and technological studies, *inter alia* (UNEP, 2017). Science users must engage with this diversity among the research provider community (in terms of disciplines, institutions and research orientation) if they are to ensure use of BASE. Additionally interdisciplinary studies that bring the above

together to address a research problem are required (Rice, 2016). The information may originate from many sources including from local stakeholders and communities (UNEP, 2012; Weichselgartner and Marandino, 2012) (**Figure 1**). As governance becomes more widely accepted as including all stakeholders, the need to provide for the coproduction of information by scientists, users and other interested parties is increasing and adds further complexity (Gustafsson et al., 2017; Norström et al., 2020).

### Science-Policy Brokers/Boundary-Spanners

Connecting science and policy as described above is thought to require yet another kind of expertise in the form of an intermediary or broker that facilitates the exchange of information between science providers of all kinds and science consumers (Bednarek et al., 2015; Goldsmith et al., 2016). Actors in this role are often referred to as boundary-spanners (Cook et al., 2014; MacDonald et al., 2016; Bednarek et al., 2018). Bednarek et al. (2018) define the practice of boundary-spanning as “work to enable exchange between the production and use of knowledge to support evidence-informed decision-making in a specific context” and define boundary-spanners “as individuals or organizations that specifically and actively facilitate this process” (p. 1176).

There is a substantial literature on boundary spanning which has its origin in organizational and management studies (e.g., Tushman and Scanlan, 1981; Levina and Vaast, 2005). A full review of these concepts is beyond the scope of this paper. More recently, these concepts have been applied to science-policy interfaces (see review by Gluckman et al., 2021). Of particular interest for this paper is their application in science-policy interfaces for environmental governance (e.g., Guston, 2001; Smith et al., 2018; Jensen-Ryan and German, 2019) and especially for oceans (e.g., Driscoll et al., 2011; Cook et al., 2014; Goodrich et al., 2020; Posner et al., 2020). The conceptual developments pertaining to boundary spanning in science-policy arenas include activities by individuals and organizations. Note however, that most of the research has been done on national science-policy interfaces, with less attention to regional transboundary science-policy arenas (e.g., McConney et al., 2016a).

## MATERIALS AND METHODS

This study includes 20 major regional intergovernmental arrangements for governance of ocean ecosystems in the WCR. These arrangements were included based on previous analyses in this region (Mahon et al., 2015; Fanning et al., 2015; Cooke, 2017; Mahon and Fanning, 2019a,b). The LME Governance Framework which provides the conceptual basis for this evaluation is based on the premise that effective regional governance requires complete policy cycles, each with five stages; namely ‘data and information (DI),’ ‘provision of advice,’ ‘decision making,’ ‘implementation,’ ‘review and evaluation,’ at multiple levels (local, national, subregional, regional and global) with appropriate lateral and vertical linkages among them (Fanning et al., 2007). The first three stages above encapsulate the science-policy

interface with ‘DI’ representing science providers, ‘provision of advice’ representing translation of science into policy relevant advice, including brokerage and boundary-spanning functions, and ‘decision making’ representing science users.

Following the approach of Mahon et al. (2015), this study examines the occurrence of each of the three stages in policy cycles associated with each arrangement in the WCR. Regarding the data and information stage, the main question asked is who the science providers are. Regarding the provision of advice stage, the questions pursued are: Is the science advisory function clearly specified in the agreement? If not, is it identifiable as a regular process based on documented outputs, or is it irregular, unsupported by formal documentation, or even entirely absent? Regarding the decision-making stage a key question is who decides and whether decisions are binding, passed to another arrangement as recommendations for decision-making there, or only recommendations for participating countries for voluntary implementation?

For each arrangement, the institutional mechanisms for policy making were determined from constituting documentation such as conventions and operating rules. Sources and pathways of scientific input to the identified science-policy arenas were determined by examining documentation of key meetings. In addition to the regional IGOs reviewed, the activities of NGOs that have been involved in regional science-policy interfaces are considered to evaluate the roles that they have played. In all cases, attention was paid to boundary spanning activities by actors within the science-policy arenas. In order to evaluate the extent of boundary spanning activities, a broad view of what constitutes a boundary spanning activity was taken. We found the seven possible functions suggested by Goodrich et al. (2020) provided guidance appropriate for our scoping exercise:

- (1) “Connecting producers and users of knowledge by enabling and organizing their interaction, including providing logistical, mediation, facilitation, and financial support;
- (2) Reconciling and protecting interests, different motivations, and cultures at the boundary and attending to issues of equity, unequal power, inclusivity, and trust building;
- (3) Acting as ‘honest brokers’ by specifically focusing on integrating scientific knowledge with stakeholder input and offering (or helping influence) alternative approaches;
- (4) Fostering mutual understanding among different interests while representing the interests of all (i.e., a stabilizing role at the science-policy interface);
- (5) Co-producing and disseminating materials, tools, and objects (e.g., communication and visualization resources, scenarios, models, maps, apps) that can help bridge users and producers of knowledge but also customize information to different decision contexts;
- (6) Providing services, training, and complementary expertise to enhance the production of actionable knowledge;
- (7) Supporting and fostering the creation and maintenance of knowledge networks and communities of practice that sustain the co-production of knowledge and use.”

These functions were used to identify boundary-spanning activities by individuals within all types of organizations, and by entire organizations. Brief descriptions of these activities are provided to facilitate this evaluation and illustrate the diversity of boundary-spanning functions occurring within the WCR.

There are other actors whose activities may impact marine ecosystems in the WCR. Their science input needs are also relevant; for example tourism, oil and gas, shipping, energy, mining. Some have regional IGOs that could also play a role in regional ocean governance, such as the Caribbean Tourism Organization (CTO), Caribbean Shipping Association (CSA), Port Management Association of the Caribbean (PMAC), Regional Association of Oil, Gas and Biofuels Sector Companies in Latin America and the Caribbean (ARPEL). However, these bodies are not included in the current analysis which focuses only on those bodies with a mandate for ecosystem management.

Finally, every effort has been made by the authors to objectively assess the identified science-policy arenas in the WCR through the use of the peer-reviewed frameworks and guidance. However, it must be noted that we have been engaged in regional and subregional ocean governance arrangements and activities involving all of the regional organizations included in this study for over 40 (RM) (Mahon, 2020) and 16 (LF) years and we draw extensively on our experiences. While being aware of the potential drawbacks of insider research (Teusner, 2016; Fleming, 2018), it is important to note that some of the information and insights acquired for this study are not readily available on websites or in easily accessible documents.

## RESULTS AND DISCUSSION

This section first examines the diversity of science-policy arenas at the regional and subregional levels and the types of decisions that require science input. It examines where the decision-making responsibilities lie and resulting lateral and vertical linkages among regional organizations and with the global level. Next, it examines who the science providers are. Finally, it considers the types and operations of science-policy brokers/boundary-spanners and how their role might be strengthened. The picture that emerges is one of a diverse suite of well-structured and active science-policy processes, albeit with several deficiencies. These processes appear to be somewhat separated from a broad diversity of potential science inputs. The gap appears largely due to lack of accessibility in both directions (providers <-> consumers), with IGOs apparently preferring to use a relatively small subset of available expertise. At the same time, there is a relatively small number of diverse boundary-spanning activities, many of which are newly emerging.

### Science-Policy Arenas for Regional Ocean Governance

Within the WCR, the regional IGOs<sup>2</sup> with responsibility for ocean issues are the core of the emerging Regional Ocean Governance Framework (CLME+ Project, 2013; Mahon et al.,

2014). The mandates, science-policy processes and sources of science input of the key IGOs that are relevant to sustainable use of marine ecosystems in the WCR are shown in **Table 1**. These intergovernmental arrangements provide the majority of arenas for the uptake of science in policy making at the regional level. Some of these IGOs are indigenous multipurpose economic integration organizations with a broad mandate that includes oceans; namely the Association of Caribbean States (ACS), the Caribbean Community (CARICOM), the Organisation of Eastern Caribbean States (OECS), and the Central American Integration System (SICA) (**Table 1**). These organizations are mostly high-level policy-setting bodies and, with the exception of the OECS, have subsidiary organizations with mandates for marine ecosystem management in areas such as fisheries, pollution and biodiversity.

These four high-level bodies tend to use science only after it has been processed by other organizations into overarching policy advice. Nonetheless, ensuring that the advice that reaches them is based on the best available science is important, as they are where science policy meets multisectoral financial policy and planning (Söderbaum and Granit, 2014). Among the four indigenous multipurpose IGOs, only two, the OECS Commission and the ACS have policies and institutions for the broader topic of ocean governance. Although SICA and CARICOM have subsidiary arrangements (**Table 1**) addressing aspects of ocean governance, neither has overarching oceans policy. The development of such policy and supporting arrangements that would provide an integrating science-policy arena within which science providers and brokers/boundary-spanners could engage is long overdue in both IGOs; especially as they are now pursuing blue economic growth.

In the OECS, these sectoral responsibilities are encompassed within the structure of the OECS Commission. The OECS Caribbean Regional Oceanscape Project (CROP) which underpins the development of ocean governance in the OECS subregion links national to subregional ocean policy in an integrated program that feeds advice to sectoral ministerial decision-making processes and the heads of government. Nonetheless, the OECS arena has a limited science base within its member countries and relies on inputs from projects and external scientists selected for their specific expertise. The establishment of a fifth University of the West Indies (UWI) Campus in 2019 in an OECS Member country (Antigua and Barbuda), and the Centre of Excellence for Oceanography and the Blue Economy based at this campus augurs well for the development of a stronger science base and a more integrated OECS science-policy arena.

Most other IGOs have a sectoral focus and use science directly. All have been established by signed agreements, have secretariats and hold regular intergovernmental meetings (IGMs) in which member countries take decisions (**Table 1**). Five are fisheries IGOs (CRFM, ICCAT, OSPESCA, OLDEPESCA, WECAFC)<sup>3</sup> (**Table 1**). However, as the Ecosystem Approach to Fisheries (EAF), requires attention to ecosystem health as well as the wellbeing of the social and economic systems associated with

<sup>2</sup>In this study the term IGO refers to the entire arrangement.

<sup>3</sup>Refer to **Table 1** for full names of each IGO.

**TABLE 1 |** Key regional ocean governance arrangements in the Wider Caribbean Region and their science-policy processes.

| Arrangement   | Type, origin and mandate  | Science-policy process  | Sources of input   |
|---|---|---|--|
| ACS – Association of Caribbean States   | Indigenous multipurpose economic integration organization for all Caribbean coastal states except the United States   | The ACS's top decision making organ is the Ministerial Council comprising heads of member states. The Secretariat supported by Special Committees on key topic areas and the Caribbean Sea Commission prepare recommendations for the Council.  | Technical input is mainly from national experts as well as a small number of experts from regional organizations.  |
| CSC – Caribbean Sea Commission  | Established under the ACS to promote cooperation and coordination for sustainable development of the Caribbean Sea. Its membership includes all Caribbean coastal states except the United States.  | The Caribbean Sea Commission was established as a high level ocean policy making body to integrate ocean policy making in the WCR. The Secretariat and three technical sub-commissions develop advice for ratification by the Commission and onward submission to the ACS Ministerial Council for final decision making.  | Technical input is from sub-commissions which are not often operational. These comprise mainly national experts as well as a small number of experts from regional organizations. No iterative management processes for issues have been established requiring regular science-policy inputs. Science input has been primarily <i>ad hoc</i> addressing one-off issues perceived as priority for the region.   |
| CARICOM – Caribbean Community and Common Market                                 | Indigenous multipurpose economic integration organization for 15 Member States, and 5 Associate States, ex British colonies (except Suriname). It promotes economic integration and cooperation among its members, to ensure that the benefits of integration are equitably shared, and to coordinate foreign policy. | The decision making organs are Conference of Heads of Government which provides overarching policy and three ministerial councils with responsibility for ocean topics, <i>inter alia</i> ; Council for Trade and Economic Development (COTED), Council for Human and Social Development (COHSOD) and the Council for Foreign and Community Relations (COFCOR). These policies guide the functioning of the CARICOM institutions with responsibility for marine ecosystems (CRFM and CARPHA).             | Technical input to the CARICOM decision making organs comes from the relevant CARICOM-associated organizations, the Sustainable Development Desk at the CARICOM Secretariat and the national technical advisors to the relevant ministers.   |
| CARPHA – Caribbean Public Health Agency   | Implementing agreement under CARICOM covering pollution as it relates to human health.  | Waste management and marine pollution is a relatively small part of CARPHA's mandate. Its work is guided by CARICOM policies established at COHSOD and by the Heads of Government. These policies are developed by the Secretariat and a Technical Committee drawn from national and regional experts and vetted by an Executive Board before they are put forward to higher level organs of CARICOM  | Technical input to CARPHA policy and plans comes from national technical experts on water pollution as well as consultants engaged to carry out specific technical and policy development projects. The secretariat and work of the Cartagena Convention LBS Protocol is another key source of input. These two arrangements often collaborate on projects.  |
| CRFM – Agreement establishing the Caribbean Regional Fisheries Mechanism (CRFM) | Implementing agreement under CARICOM Fisheries  | The highest decision-making body is the CRFM Council of Ministers. However, high level overarching policy making takes place at the level of CARICOM's COTED or even CARICOM Heads of Government as in the case of the CARICOM Fisheries Policy. Advice is prepared by the Secretariat and taken to the CRFM Fisheries Forum (comprising heads of fisheries departments) for adoption before going to the Council of Ministers.   | Technical input to CRFM comes from a variety of sources including an annual science meeting in which national technical experts participate as well as technical experts from other regional IGOs, academic institutions and consultants. Not all science input passes through the science meeting. Some, primarily from consultants working on projects goes directly to the Secretariat. CRFM has a document information system that includes meeting, policy and technical reports. |
| OECS Commission – Organisation of Eastern Caribbean States                      | Indigenous multipurpose economic integration organization for 11 Eastern Caribbean SIDS (7 Full and 4 Associate Members) dedicated to economic harmonization and integration, protection of human and legal rights, and good governance among countries in the Eastern Caribbean                                      | Ocean governance in the OECS subregion is the responsibility of the Ocean Governance and Fisheries Unit (OGFU) within the secretariat. Its work is guided by the Eastern Caribbean Regional Ocean Policy (ECROP) and Strategic Action Plan adopted by the Heads of Government. Implementation is by the OECS Ocean Governance Team (OGT) comprising focal points from member countries and OGFU staff.  | Technical input to OECS policy and its implementation comes from national technical experts, primarily from government departments, as well as consultants engaged to carry out specific technical and policy development projects. Much of the consultant expertise is extra-regional associated with World Bank and Commonwealth Secretariat projects.   |
| SICA – Central American Integration System                                      | Indigenous multipurpose economic integration organization for seven Central American states and the Dominican Republic addressing political, social-cultural, economic issues and the sustainable management of natural resources.  | The Meeting of Presidents (MoP) is the top decision making body in SICA. The Council of Foreign Affairs Ministers is responsible for matters that may have international repercussions, including policy relating to transboundary marine ecosystems. The SICA family of organizations is well integrated at the SICA level, where policy is determined by the MoP, but associated organizations, notably CCAD and OSPESCA for marine ecosystems have their own Ministerial Councils for decision making. | Technical input to SICA policy comes primarily from national technical experts, mainly from government departments, as well as consultants engaged to carry out specific technical and policy development projects.  |

(Continued)

**TABLE 1 |** Continued

| Arrangement  | Type, origin and mandate  | Science-policy process   | Sources of input   |
|--|---|--|--|
| CCAD – Central American Commission for Environment and Development   | Implementing agreement under SICA. Aimed at developing a regional regime of cooperation and environmental integration across all environmental issues.  | The Council of Ministers is the top decision-making body of CCAD. Technical committees supported by the Secretariat prepare technical advice to the Commission of senior environmental bureaucrats from member countries. This advice is reviewed and put before the Council of Ministers.   | Science input is through technical committees, primarily from national government scientists, academics from regional institutions and consultants. Much of the input is derived from projects.  |
| OSPESCA – Central America Fisheries and Aquaculture Organization   | Implementing agreement under SICA. Fisheries for development and coordinated management of regional fisheries and aquaculture activities.   | The Council of Ministers is the top decision making body of OSPESCA. Working groups formulate technical input which is reviewed by the Commission of Directors of Fisheries and Aquaculture, which provides scientific and technical leadership for OSPESCA. Recommendation from the Commission of Directors goes to the Committee of Vice Ministers, which is the executive level of the organization and provides integrated advice to the Council of Ministers. | Science input is through working groups primarily from national government scientists, academics from regional institutions and consultants. Much of the technical input is derived from projects.   |
| Cartagena Convention – Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region | UNEP Regional Seas overarching convention with three implementing Protocols: Oil Spills, Land Based Sources of Pollution (LBS) and Specially Protected Areas and Wildlife (SPAW).   | The Conference of Parties is the highest level body of the Cartagena Convention. Much of its technical input comes from the COPs of its three protocols. Its output is agreed upon advice for national government or recommendations that may be input to other IGOs.  | Technical input comes from national experts, experts at the secretariat, experts in regional institutions (e.g., colleges and universities), consultants and technical staff of projects primarily via the COPs of the three Protocols.  |
| Cartagena Convention LBS – Protocol Concerning Pollution from Land-Based Sources and Activities                              | Implementing protocol under the Cartagena Convention to prevent, reduce and control land based sources pollution in the Convention area and to ensure sound environmental management.   | The Conference of Parties is the highest-level body of the LBS Protocol. Its output is agreed upon advice for national government or recommendations that may be input to other IGOs. Input to the COP is vetted by the LBS Scientific and Technical Committee which comprises national technical experts, as well as other regional experts.  | Technical input comes from national experts, experts at the secretariat, experts in regional institutions (e.g., colleges and universities), consultants and technical staff of projects.  |
| Cartagena Convention Oil Spills – Protocol Concerning Co-operation in Combating Oil Spills                                   | Implementing protocol under the Cartagena Convention to prevent, reduce and control oil pollution of the Convention area and to ensure sound environmental management   | The Conference of Parties is the highest-level body of the Oil Spills Protocol. Its output is agreed upon advice for national government or recommendations that may be input to other IGOs.   |  |
| Cartagena Convention SPAW – Protocol concerning Specially Protected areas and Wildlife                                       | Implementing protocol under the Cartagena Convention to protect rare and fragile ecosystems and habitats, thereby protecting the endangered and threatened species residing therein.  | The Conference of Parties is the highest-level body of the SPAW Protocol. Its output is agreed upon advice for national government or recommendations that may be input to other IGOs. Input to the COP is prepared by experts in the Secretariat as well as in the SPAW Scientific and Technical Committee, which comprises national technical experts and other regional experts.  |  |
| IOCARIBE – IOC Sub-Commission for the Caribbean and Adjacent Regions   | This sub-body of UNESCO-IOC is responsible for the promotion, development and co-ordination of IOC marine scientific research programs, the ocean services, and related activities, including training, education, and mutual assistance in the Caribbean and adjacent regions  | The Commission is the highest level decision making body. The Secretariat compiles and coordinate technical input for the Commission. In addition IOCARIBE holds topic specific technical meetings from which advice goes directly to participating countries.   | Commission members often have technical expertise or are supported by technical experts from their institutions. Nonetheless technical input to Commission meetings is primarily from experts engaged in IOCARIBE projects and programs.   |
| PSC MOU LA – Memorandum of Understanding on Port State Control in Latin American   | Implementing agreements under the Intergovernmental Maritime Organization. Mandates cover the inspection of foreign ships in national ports to verify that the condition of the ship and its equipment comply with the environmental and safety at sea requirements of international regulations and that the ship is manned and operated in compliance with convention standards of relevant instruments, mainly IMO and ILO agreements. | The executive body is a Latin American Port State Control Committee comprising representatives of all member states.   | There appears to be little need for science input as the MOU-PSC is primarily about implementing globally agreed measures through monitoring and enforcement activities. Information input is largely from countries about progress with these activities at the national level. |

(Continued)

TABLE 1 | Continued

| Arrangement   | Type, origin and mandate   | Science-policy process  | Sources of input   |
|---|--|---|--|
| PSC MOU<br>Caribbean –<br>Memorandum of<br>Understanding on<br>Port State Control<br>in the Caribbean<br>Region |  | The executive body is a Caribbean Port State Control Committee comprising representatives of all member states.   |  |
| WECAFC –<br>Western Central<br>Atlantic Fisheries<br>Commission   | Implementing regional fisheries management organization, under FAO to promote the effective conservation, management and development of the living marine resources and address common problems of fisheries management and development among member countries | The highest level body is the WECAFC Commission. This is informed by a Scientific Advisory Group (SAG) which provides general guidance and vets technical input to the Commission meetings. There are also several working groups addressing various resource types or technical issues that report to the commission. Decisions of the commission are recommendations to countries.  | Primarily national government scientists, experts from FAO headquarters and consultants. Academics from institutions in the region are often named to the SAG and working groups as well as participating in the Commission meetings.  |
| ICCAT –<br>International<br>Convention for the<br>Conservation of<br>Atlantic Tunas                             | Implementing arrangement for maintaining populations of tuna and tuna-like fishes at levels which permit the maximum sustainable catch for food and other purposes (extends throughout Atlantic Ocean)   | The Commission is the top decision making body. Technical advice is developed by species panels and working groups which provide their recommendations to the Standing Committee on Research and Statistics (SCRS) which formulates advice for the Commission.  | Technical input comes primarily from national governmental experts who are often supported by experts from academia. Experts from observer organizations also provide input. The process is supported by a data centralized data function at the Secretariat which takes in national data and information and performs a quality control and standardization function. |
| OLDEPESCA –<br>Latin American<br>Organization for<br>Fisheries<br>Development                                   | Implementing development organization to meet the food demands of Latin America, using its potential fishery resources for the benefit of their peoples.   | The Council of Ministers is the highest decision-making body. Expert Groups and the Technical Committee prepare technical advice which is reviewed by the Board before being passed to the Council of Ministers   | Technical input comes primarily from experts from national governments research institutes. OLDEPESCA does not manage fisheries, its decision are primarily programmatic.  |
| IAC –<br>Inter-American<br>Convention for the<br>Protection and<br>Conservation of<br>Sea Turtles (IAC)         | Implementing agreement (extends to Pacific coast of Americas) to promote the protection, conservation and recovery of sea turtle populations and of the habitats on which they depend.   | IAC Scientific Committee analyzes research pertaining to sea turtle biology and population dynamics and makes scientific recommendations to the Consultative Committee which reviews reports from the Scientific Committee and member states in order to recommend conservation and management activities to the Parties and analyze the effectiveness of measures already in place. Decisions are taken at a biennial COP and are binding. | Technical input comes from national experts, experts at the secretariat, experts in regional institutions (e.g., colleges and universities), consultants and technical staff of projects. Countries are required to report annually on their activities supporting the convention. There is no centralized data and information system.                                |

*The four indigenous multipurpose economic integration organizations and their associated bodies are presented first, followed by the UN related arrangements, with the two independent arrangements at the end.*

fishing, they will require the fullest range of science input for effective decision making. Seven IGOs have a mandate to address various aspects of pollution (Cartagena Convention, Oil Spills Protocol, LBS Protocol, CCAD, CARPHA, two PSC MOUs), while three have a mandate for biodiversity issues (SPAW Protocol, CCAD, IAC) (Table 1).

Most IGOs have well defined processes articulated in their constituting and operational documents, and for which there is ample evidence of operation in the form of meeting reports. These processes produce recommendations which may be taken to a political decision-making level, if there is one associated with the IGO, or for adoption at the national level (see below). Some IGOs meet biennially, for example, WECAFC, IOCARIIBE, the Cartagena Convention and its protocols; but most convene at least annually. In addition, most hold technical meetings which may be of associated technical bodies, *ad hoc* meetings on special issues, or project related. Thus across the entire suite of arrangements, there is a large array of meetings each year that

both science providers and boundary-spanners must grapple with if they are to make or facilitate effective science inputs.

Several arrangements are sub-bodies of global level UN organizations; namely UNESCO-IOC, UNEP, IMO, and FAO (Table 1). While these regional level arrangements may set some types of policy, they rely on their global bodies for overarching policy direction. Thus, this aspect of the science-policy interface must span the regional/global interface and requires regional input to adapt global policy to the regional level. Similarly, where regional IGOs are sub-bodies of indigenous regional economic integration bodies (namely ACS, CARICOM and SICA), some policy advice must transit from the sub-body to the parent body for policy decisions (Table 1). In the ACS, its Caribbean Sea Commission has its own ministerial council and could function as the high-level science-policy interface that it was originally intended to be (ACS/CERMES-UWI, 2010). However, it has not taken up this role and functions mainly as an implementing body for projects.

The majority of science input across the entire suite of arrangements is oriented toward programmatic decisions such as which projects and research initiatives to pursue and the implications of subsequent findings for regional and national policy and legislation. The other common form of advice is on overarching policy, such as the CARICOM Common Fisheries Policy<sup>4</sup>, the Castries Declaration on Illegal Unreported and Unregulated Fishing<sup>5</sup> or the OECS St. Georges Declaration (Geoghegan, 2015). Few organizations provide advice as part of regular recurrent processes that manage ongoing issues such as fisheries stocks (e.g., ICCAT, CRFM), pollution levels, or biodiversity loss. The irregular nature of needs for science advisory inputs likely makes it difficult for science providers to engage, emphasizing the need for boundary-spanning actors.

Data and information functions in regional IGOs are generally limited; perhaps due to irregular science needs. Information on these functions is not included in **Table 1** to avoid extensive repetition. ICCAT, and WECAFC are the only IGOs which maintain centralized databases on recurrent issues for which they have a mandate. For ICCAT, the secretariat vets and combines data for use by the assessment working groups. For WECAFC, the data are held at FAO headquarters, Rome, and extracted to produce reports for WECAFC meetings. All other IGOs maintain document libraries of technical and meeting reports. However, they seldom maintain databases for monitoring variables of concern. The ease of access to, and completeness of, document libraries vary widely across IGOs. Databases and documentation on issues falling under an IGO's mandate are of critical importance for institutional memory which underpins continuity and consistency of technical input; especially when there are few technical staff in the secretariats and external experts may change over time.

The suite of IGOs and associated arrangements described above presents a complex set of science-policy arenas with which science providers seeking to influence policy must engage, either directly or through boundary-spanners, to (a) have their science outputs considered and (b) to determine what the major questions are so they can orient their research accordingly. In addition to the regular and *ad hoc* processes of regional IGOs, there are other emergent science-policy processes with which science providers must cope, for example, those for the international agreement on conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ Agreement), the invasive lionfish and the sargassum invasion affecting the entire region.

## Actual and Potential Sources of Scientific Input

Our analysis of constituting documentation and operational rules for the 20 arrangements found science input to IGO and other science-policy processes was obtained primarily from national governmental experts, IGO Secretariat staff, and projects carried out for IGOs by consultants (which may include academic researchers) (**Table 1**). Academic researchers from universities

and research laboratories are less frequently directly involved in providing science input (**Table 1**). When they are involved, IGOs appear to use a limited selection of experts as also found by Fanning and Mahon (2021). This is concerning given that the academic research community in the WCR is highly heterogeneous and there is considerable research capacity within the region across the varied types of research required. Toro (2017) reported that there are 147 academic higher education institutions (universities, polytechnics, colleges) with marine science and technology programs in the WCR. If the full range of disciplines and types of research needed are considered, this number will be considerably higher. Most of these academic institutions are concentrated in a few countries (United States, Mexico, Colombia, and Brazil) and the remainder are distributed through 14 other countries. Collectively they represent considerable research capacity. These institutions and their research capacity has not been fully inventoried which would be useful in coordinating research, especially its transfer to decision makers.

Regional IGOs also conduct research either by permanent secretariat staff, mostly facilitating the synthesis of knowledge from secondary sources, or through projects being carried out by consultants (e.g., CRFM, 2019; CCAD, 2020). These activities have generated considerable quantities of research not all of which is readily accessible or obtainable through conventional web-based search processes. Similarly, local, national and regional NGOs produce applied research which can be found mainly in the gray literature. As with tertiary educational institutions, no reliable inventory of these organizations or their research outputs exists. National agencies often have researchers as well; again mainly concentrated in the larger more developed countries. Nonetheless, the collective research capacity in national departments of the many smaller, less developed countries is likely to be considerable.

Finally, a considerable amount of research is conducted in the region by external researchers, mainly from universities. It is not uncommon for such research to be conducted unbeknownst to anyone in the WCR and published in journals and reports that are difficult to know about, let alone access. According to Stefanoudis et al. (2021) this 'parachute science' is a common problem worldwide. They call on researchers and publishers to adopt practices to minimize this problem, especially by including local researchers and observing national research policies requiring that data and reports be provided to relevant agencies in the country. However, smaller countries may not have the capacity to monitor and enforce these policies or to manage these data and reports when they are provided. Hence the need for such capacity at the subregional and regional levels. At the subregional level, the OECS Commission has a 'Code of Conduct for Responsible Marine Research' that promotes sharing and dissemination of research by all researchers (OECS Commission, 2016). However, what is also lacking is a regional level registry of researchers who fail to adhere to information sharing principles and practices.

It is evident that there is considerable research capacity in the WCR, but that its wide institutional and geographic distribution makes it difficult to access either the outputs, or more importantly, the expertise. This is not to say that there is sufficient

<sup>4</sup><http://extwprlegs1.fao.org/docs/pdf/mul167228.pdf>

<sup>5</sup><http://www.fao.org/tempref/FI/DOCUMENT/wecafc/15thsess/ref11e.pdf>

research, that capacity is adequate, or that topics are adequately covered. However, efforts to increase the uptake of science in decision making should consider information and expertise that is already available and develop mechanisms to access it, in addition to seeking to promote more and better research.

The relatively low input of academic science into policy advisory processes may be due to the lack of mechanisms by which IGOs can access these sources. Just as it is a daunting task for researchers to be aware of the potential routes of uptake for their research, it is a considerable task for IGO staff responsible for coordinating technical input into advice to be aware of relevant science being done in the wide range of circumstances described above, far less to be in communication with the researchers. This is a push-pull barrier that may contribute to the scarcity of direct scientific input into governance processes in the WCR also described by McConney et al. (2017).

In some regions there are specialized regional research organizations that provide technical input to regional IGOs, for example the International Council for Exploration of the Sea (ICES), in the northeast Atlantic, The North Pacific Marine Science Organization (PICES), in the north Pacific, and the Coastal Oceans Research and Development – Indian Ocean (CORDIO) program (Mahon et al., 2015). These organizations are directly connected to the science-policy interfaces that they serve. No such regional organization exists in the WCR. The likelihood of a research advisory organization being established for fisheries is low considering the relatively low revenue generating nature of the predominantly small-scale fisheries in the region; notwithstanding their high importance for livelihoods and food security (Oxenford and McConney, 2021). The tourism sector, which derives considerable revenue from healthy marine ecosystems, and could support such an organization, is yet to show any significant interest in contributing to marine ecosystem research or governance at the regional level.

## Brokers/Boundary-Spanners

Given the documented inadequacy of established linkages between science producers and consumers, alternative mechanisms for bridging the science-policy gap and strengthening the application of BASE in decisions affecting ocean governance in the WCR needs to be explored. We are not suggesting efforts aimed at improving direct interactions between users and providers should be abandoned. However, given the ocean governance challenges inherent in the WCR (Fanning et al., 2021b), it seems pertinent to examine the potential role boundary spanning organizations and individuals might play in mitigating some of the more intractable challenges. These include social and financial capital, capacity building and socio-cultural factors stemming from a history of colonization across the region.

In addition to the regional (IGOs) reviewed, the activities of key NGOs that have been involved in regional science-policy interfaces in the WCR were evaluated to determine their actual and potential brokering/boundary spanning activities with reference to the seven functions of Goodrich et al. (2020), noted as f1–f7 in parentheses. However, given the diversity of actors in science-policy arenas in the WCR, it is often difficult to determine

their relative roles, as some actors may perform multiple roles as noted by Bednarek et al. (2018). For example, the same actors may at times engage in providing science inputs as academics and at other times as consultants; or the same actors may be science providers to advisory processes on some occasions and advisors at others.

IOCARIBE, IOC-UNESCO's regional commission in the WCR has a mandate to promote and coordinate marine science (Table 1) (f1, f4–f7). Consequently, it might be expected to play a role in facilitating the strengthening of science-policy interfaces in the region. However, it does not have a mandate for any specific governance issue, or to function as a provider of science input for specific issues that are the mandates of other IGOs. Most of its advice is directed to its commission and is programmatic. However, some of its programs include workshops and conferences that bring science into the policy arena, result in direct advice to member countries; for example the development of a regional tsunami warning system<sup>6</sup>, or the Caribbean Marine Atlas<sup>7</sup> (f4, f5). These have often linked regional with extra-regional experts, thus extending the scope of science input. IOCARIBE's role in developing a boundary-spanning regional hub or platform to provide access to regional expertise, data and information through the Caribbean LME Initiative is discussed below (f7).

The Gulf and Caribbean Fisheries Institute (GCFI), established in 1947, is a regional focal organization for fisheries research. Its annual conference brings scientists, fishers, managers, and policy advisors from around the region together. The conference includes workshops on topical issues aimed at generating applied advice. Through time, GCFI has embraced emerging topics such as sociology of fisheries and ecosystem-based management. This information is published in the conference proceedings. In this way it plays a role as a boundary organization (f4–f6), but this has not been formalized with the relevant IGOs and pertains only to fisheries. Its engagement with the previous and current phases of the Caribbean LME (CLME) Initiative reflects a more structured role as a boundary-spanner through the development of an information hub in the first phase and a science plan in the second phase (Acosta et al., 2020) (f7).

The members of the Association of Marine Laboratories of the Caribbean (AMLC) are marine laboratories of all types including extra-regional organizations with laboratories in the region (e.g., Smithsonian Institution and McGill University). It has 22 members which represent a considerable potential source of information and expertise. AMLC is well positioned to play a role as a broker/boundary-spanning organization. A proposal in 2010 that it should do so through association with the CLME Project, with which all regional IGOs were engaged, was not approved by the AMLC Board which noted that its role was to promote science rather than to link it to policy. A subsequent attempt by some AMLC Members to create a stand-alone 'Cooperative Network of Marine Laboratories' in 2014 did not gain the necessary financial support from donors. While AMLC

<sup>6</sup><https://www.ctic.ioc-unesco.org/>

<sup>7</sup><https://www.caribbeanmarineatlas.net/>

only carries out function f7 incidentally. it has the potential to undertake other functions as well.

The University of the West Indies (UWI), while mainly a science provider, has also played a boundary spanning role as an institution. In 2011 it established the UWI Ocean Governance Network, a Google e-group linking 90+ faculty with an interest in oceans across its four campuses. The Network served as a forum for exchange among community members, and to link them to the needs of external agencies such as the CRFM and ACS with which it had MOUs (f1). However, it was not much used until 2015, when CARICOM took an integrated approach to negotiating the international legally binding instrument under the United Nations Convention on the Law of Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ Agreement). In 2016 the Network was used to find four experts to join the overall CARICOM advisory team which included the CRFM, the OECS Commission and national experts. This time-bound *ad hoc* process is led by the Sustainable Development Desk at CARICOM Secretariat and the advice flows via that desk to the CARICOM negotiators at the United Nations Representations in New York. The UWI is a large institution within which individuals also carry out all of f1–f7, as noted for universities by Smith et al. (2018), albeit to different extents across its campuses and bodies. There is certainly considerable potential for UWI to become more mainstreamed as both science provider and boundary-spanner for the IGOs serving its member countries.

The Caribbean Natural Resources Institute (CANARI) is a regional NGO that focusses on small-scale livelihoods and inclusion of local stakeholders in national and regional governance. It sometimes functions as a science provider by generating social science information on community-based management. However, it also plays an organizing role by providing capacity building that enables local level engagement (f6), and by taking a programmatic approach to getting legitimate local and community level inputs into regional science-policy arenas (f1, f2). Notable is the development of the Civil Society Action Programme for the Sustainable Management of the Shared Living Marine Resources of the Caribbean and North Brazil Shelf LMEs (2018–2030) (CANARI, 2018). Indeed over the years in its many projects, CANARI has carried out all seven functions of Goodrich et al. (2020).

The Caribbean Network of Fisherfolk Organisation (CNFO) is a network of small-scale fisher folk and their organizations for CARICOM countries. In addition to their role in improving livelihoods for fisher folk, they play a role in fisheries governance and sustainable fisheries development by engaging with regional fisheries management organizations to ensure that the views of, and information from, small-scale fishers are represented in regional level decision-making (McConney and Phillips, 2011) (f1). As such, they serve as a boundary-spanning organization channeling information from a broad base of fisher folk through legitimate representation into regional fisheries processes (McConney et al., 2016b, McConney et al., 2017) (f2, f4). CNFO representatives have also played this role in global level processes such as the FAO Committee on Fisheries and the UN Oceans Conference.

The Caribbean Fishery Management Council (CFMC), is a national organization that adopted a regional role for queen conch fisheries. As one of eight US Fishery Management Councils established under the 1976 Magnuson-Stevens Fishery Conservation and Management Act, its purpose is to conserve, restore and manage fishery resources in Puerto Rico and United States Virgin Islands. Nonetheless, it has become the lead agency in developing a regional fisheries management plan for queen conch. It has brought together all the regional fisheries bodies (CRFM, WECAFC, OSPESCA) and countries with significant queen conch resources to develop this plan, which is then taken up by the processes of the fisheries bodies (f3, f7). In this role it performs as a regional level boundary-spanning activity.

The Nature Conservancy (TNC) is a large NGO with global reach and considerable activity in the WCR, mainly projects to manage marine ecosystems; especially through marine spatial planning and marine protected areas. However, there is also a component of information brokerage and advocacy at the regional level (f2, f7). Its most notably technical initiative was its ecoregional planning program that mapped marine and terrestrial biodiversity in the insular Caribbean and proposed networks of protected areas for conservation (Huggins et al., 2007). This initiative marshaled a substantial amount of technical expertise and data, but ultimately did not have much uptake at the regional level. This is probably because it was not connected to any regional arrangement or process and the outputs did not have any champions within these arrangements. In another initiative, the TNC Caribbean Challenge Initiative played a central role in developing a regional program connecting sources of extra-regional funding for marine protected areas with high level national decision makers. This was technically supported by the Secretariat of the Cartagena Convention, the UNEP Caribbean Environment Programme (UNEP CEP) and resulted in several commitments to upscale protected area coverage.

The World Resources Institute is a large global NGO based in the United States. Its Reefs at Risk program integrated a wide variety of information on the status of reefs and related ecosystems globally with data on the pressures affecting them (Bryant et al., 1998). The Caribbean component of this initiative (Burke and Maidens, 2004) integrated information from a wide range of stakeholders (f4). The information was shared in a highly visual, easy to understand format which is fundamental to uptake (McConney et al., 2016a) (f5). The outputs were actively taken up by regional and national policy fora. That reefs were already high profile ecosystems connected to tourism and biodiversity concerns, and decision makers were under pressure from regional and global organizations to address reef degradation may also have promoted uptake in contrast to the TNC ecoregional planning initiative discussed above.

The *ad hoc* science-policy arena for the sargassum seaweed invasion WCR provides an example of an emergent boundary-spanning activity. In 2011 unprecedented massive influxes of pelagic sargassum seaweed took the Caribbean completely by surprise (McConney and Oxenford, 2020). They disrupted fishing and tourism activities as well as recreational use of beaches and the sea throughout the region. Influxes of

sargassum have continued intermittently since 2011. There was no regional or subregional policy process or science-policy interface for this problem in the Eastern Caribbean (McConney and Oxenford, 2020). The response which emerged through the often fragmented efforts of the multiplicity of stakeholders was decidedly self-organized rather than centrally facilitated. Rather, was facilitated by stakeholders and various boundary-spanning activities on the part of regional and national organizations, that rapidly brought regional and extraregional science to bear on the problem which policy makers were flagging as critical (f7). However, communication among stakeholders and between the stages of the policy process was, and continues to be, a major challenge (McConney and Oxenford, 2020).

Projects may also play temporary boundary-spanning roles. A full review of regional and subregional projects that have played this role is beyond the scope of this paper. However, it has been noted that projects that adopt a boundary spanning role may leave a gap when the project ends, unless the project is designed to leave a mechanism in place to sustain that function. Two regional level examples illustrate this situation. The first is the Caribbean Regional Fisheries Assessment and Management Programme (CFRAMP) funded by the Canada International Development Agency (CIDA) from 1992 to 2004 which developed fisheries science and management capacity among CARICOM countries (Mahon, 2020). At its completion, it established the CRFM to continue that function (Haughton et al., 2004), which it continues to do (Table 1). The second example is the CLME Initiative, a suite of four GEF projects spanning 20+ years (Fanning et al., 2021b). The CLME Initiative engaged the major regional IGOs to promote an ecosystem-based approach to the major fisheries ecosystems in the WCR (f1). It supported pilot activities (f6) that brought science to bear on fisheries ecosystem issues and contributed advice into science-policy processes with the aim of strengthening them in a learning-by-doing mode (f5) (Fanning et al., 2009). Ultimately, the IGOs and countries of the WCR agreed that the role played by the CLME Initiative in integrating science and policy-making at the regional level should be continued by a regional coordination mechanism (f7) (CLME+ Project, 2013). The mechanism was designed (CLME+ Project, 2019) and adopted in principle by the countries in 2021, subject to national political approval. It is anticipated that this mechanism will be established in the next Phase of the CLME Initiative.

These examples of brokering/boundary-spanning activity serve to illustrate the diversity of circumstances to be found in the WCR that contribute to linking science production and policy making (Table 2). These instances can best be described as arising organically to meet the variety of needs rather than as deliberately planned by the institutional processes in the IGOs with a mandate to ensure sustainable use of marine ecosystems in the WCR. Notably only four organizations were seen to be addressing function two “Reconciling and protecting interests, different motivations, and cultures at the boundary and attending to issues of equity, unequal power, inclusivity, and trust building.” This is an important function if inputs of local and traditional knowledge holders is to be incorporated into decision making in a legitimate and trusted fashion.

We are conscious that a more rigorous evaluation of boundary spanning activities for ocean governance in the WCR is needed. Figure 2 illustrates the key actors involved in enhancing the application of BASE in ocean governance decision making within the WCR and their roles as science providers, consumers and nascent boundary spanners. However, we are of the view that although most organizations reviewed undertake boundary spanning activities, none can be described as an boundary spanning organization designed for that purpose.

## Improving Brokering/Boundary-Spanning Capacity in the WCR

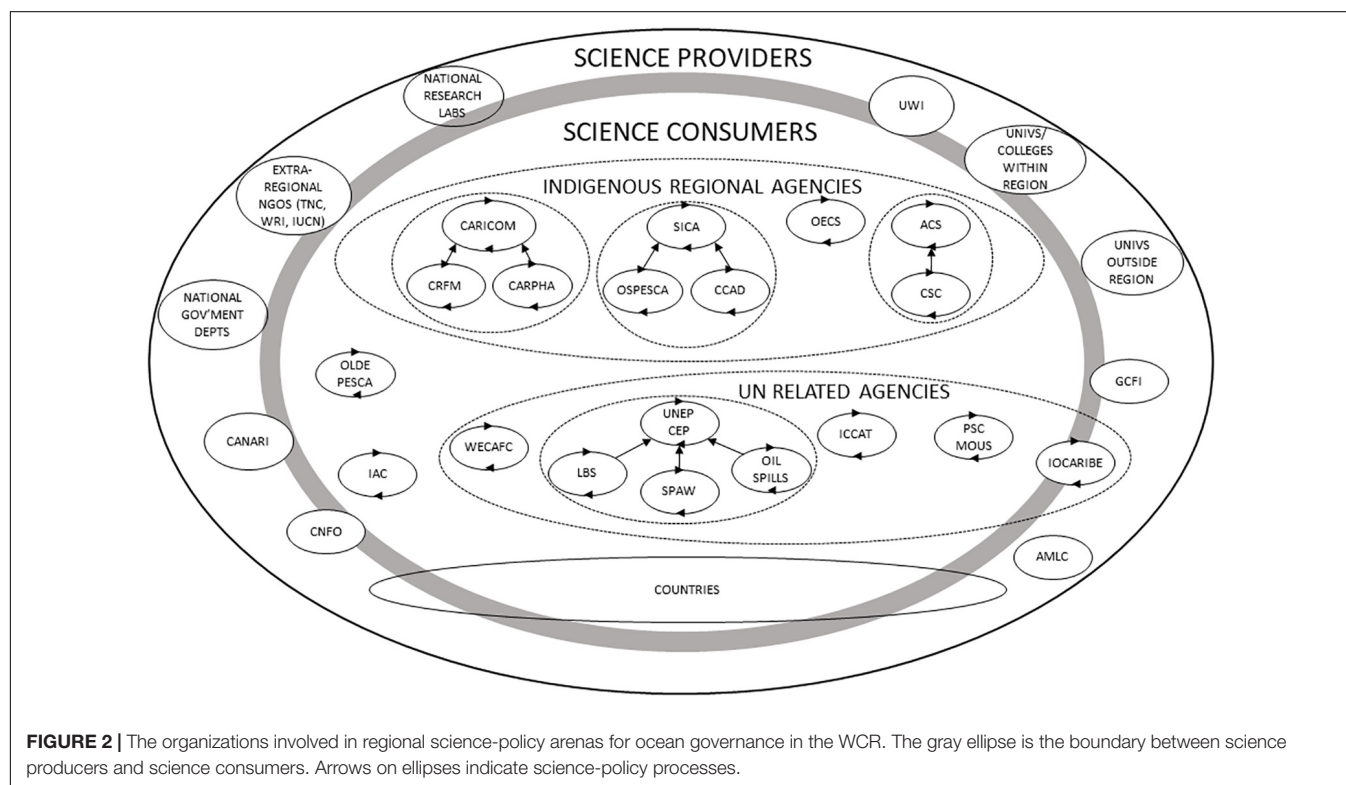
This study has provided insight into the diversity of regional level boundary-spanning activities currently taking place in the WCR. However, only a few organizations could be identified as formally engaging in boundary spanning activities (IIOCARIBE, CANARI, GCFI, CNFO), and this was not their primary function. This section explores what can be done to improve the effectiveness of boundary-spanning activities in the WCR as a means of improving the current science-policy arenas affecting the success of regional ocean governance. The lessons from this scoping study could also be useful to other ocean regions.

At the institutional level, there is the need for policy change in which the individuals and organizations responsible for using BASE in decision-making, are encouraged to recognize the distinct role of boundary-spanners, engage them, promote their activities and mainstream them into their organizations’ arrangements as suggested by Goodrich et al. (2020) and IASS et al. (2020). This could include promoting the establishment of formal boundary spanning organizations (Kennedy, 2018) noting their importance as ‘honest brokers’ that can operate at ‘arm’s length’ from policy makers (Boswell, 2018; Kennedy, 2018). At the same time, it is worth noting that successful boundary spanning linkages may be less about utilizing formal boundary organizations and more about fostering the process through which science and policy are intermingled (Jensen-Ryan and German, 2019). Consequently, a broad approach that focusses on practical actions such as developing web-based decision support tools and improving boundary spanning functions within existing IGOs should also be considered (Goodrich et al., 2020). Most already have some degree of internal boundary-spanning capability in the form of program officers who are technical generalists, or in-house specialist expertise, for example CRFM, while many have expertise supported by short-term funding or attached to projects. One approach to strengthening this capacity in IGOs would be the establishment of scientific advisory groups for IGOs as was proposed for the OECS Ocean Governance Team, drawing on the expertise of other regional institutions (Renard, 2020). Several of the IGOs already have technical advisory committees (Table 1), but the constitution of these and their effectiveness in bringing BASE into decision-making has not been evaluated in any case.

To support building the capacity of boundary-spanners, there is need for their functioning and effectiveness to be more thoroughly examined to understand their operations

**TABLE 2 |** Preliminary assessment of organizations within the WCR demonstrating the boundary-spanning functions of Goodrich et al. (2020).

| Organizations | f1 connecting producers and users | f2 reconciling and protecting interests | f3 acting as 'honest brokers' | f4 fostering mutual understanding | f5 co-producing and disseminating information | f6 providing services, training and expertise | f7 supporting and fostering knowledge networks |
|---------------|-----------------------------------|---|-------------------------------|-----------------------------------|---|---|--|
| IOCARIBE      | ✓                                 |   |                               | ✓                                 | ✓   | ✓   | ✓  |
| GCFI          |                                   |   |                               | ✓                                 | ✓   | ✓   |  |
| AMLC          |                                   |   |                               |                                   |   |   | ✓  |
| UWI           | ✓                                 | ✓                                       | ✓                             | ✓                                 | ✓   | ✓   | ✓  |
| CANARI        | ✓                                 | ✓                                       | ✓                             | ✓                                 | ✓   | ✓   | ✓  |
| CNFO          | ✓                                 | ✓                                       |                               | ✓                                 |   |   |  |
| CFMC          |                                   |   | ✓                             |                                   |   |   | ✓  |
| TNC           |                                   | ✓                                       |                               |                                   |   |   | ✓  |
| WRI           |                                   |   |                               | ✓                                 | ✓   |   |  |
| Sargassum     |                                   |   |                               |                                   |   |   | ✓  |
| CLME+         | ✓                                 |   |                               |                                   | ✓   | ✓   | ✓  |



and impacts, and ultimately to prepare guidelines and best practices for their operation. Smith et al. (2018) emphasized the need to understand context before designing and implementing boundary management strategies. Similar studies in other global ocean regions leading to interregional learning may also be useful (Mahon and Fanning, 2019a). Posner and Cvitanovic (2019) note that such research will be a “challenging prospect as such impacts occur in complex social and ecological systems; involve subtle, gradual, and difficult-to-track changes; and elude conventional evaluation methods that fail to capture the complexity of real world science and decision-making contexts” (p. 141). The

diversity of types and settings of boundary-spanning activities to be found in the WCR underscores their view. They also emphasize that such studies would help “clarify general principles for what success looks like and how to measure it.” Gluckman et al. (2021) provide an example of how analysis can generate recommendations for effectiveness. These studies could include application and testing of approaches such as the workshop model designed by Goldsmith et al. (2016) to bridge the gap between coastal and marine decision makers and scientists.

Among the practical activities needed to improve the connection between science and policy are mechanisms to

improve access to the widely dispersed scientific capacity and sources of information within the WCR. Gorg et al. (2016) considered the strengths and weaknesses of two extreme approaches; a network model and a platform model. The former is less formal, and less resource intensive, but subject to the voluntary engagement of science providers for effective functioning. The latter is more formal and demanding of resources for its operation, but more reliable and comprehensive. The development of a mechanism to improve uptake of science in policy was planned in the 2011–2014 Phase of the CLME Initiative. It was to facilitate access by policy makers to science expertise throughout the region and thence to the desired data and information. The planned mode of operation was that in response to a query from a policy maker or advisor, a core team of three to five topic experts would be assembled. They in turn would engage with other experts, within and beyond the WCR, in a working group to address the question with the best available information and determine what additional research would be required. Teams would remain functional as long as needed, might change membership as the problem evolved, and could develop long-term relationships with the regional IGOs and other science users as appropriate. This initiative went as far as to establish an information hub, housed at the GCFI, but the mechanism was not attached to an institution, which was initially envisaged as being IOCARIBE. This mixed platform-network approach remains to be explored for the WCR. The CLME+ Hub for the Wider Caribbean currently being developed by the CLME+ Project has the potential to serve as such a mechanism, but will also need an institutional home that will proactively pursue the further development and operation of the mechanism (CLME+ Project, 2020). Given its mandate to promote uptake of science in policy making, the proposed regional coordination mechanism emerging from the CLME Initiative (CLME+ Project, 2020) will need to reflect carefully on this and other possible approaches.

## CONCLUSION

This scoping study of science-policy arenas for ocean governance in the WCR finds that while regional IGOs provide the institutional basis for much of the uptake of science by regional ocean governance processes, the science-policy arenas are diverse, complex and interconnected. Many have some degree of internal boundary-spanning capability in the form of program officers and resident technical experts. While several have pathways to ministerial decision-making, they must often revert to their parent organization, which may be at the global level. Others have no access to ministerial level decision making and must rely on uptake at the national level or on champions from other IGOs with ministerial decision-making capacity to take the recommendations forward. The lack of decision-making bodies in several of the arrangements and their reliance on national uptake for implementation is a weak area in the regional science-policy arena in the WCR.

The regional science-policy landscape is further complicated by the occurrence of other science-policy arenas at the

regional level that are emerging or not part of an established, regular regional process, for example, the sargassum issue and CARICOM's engagement with its UN representations in formulating input to the BBNJ agreement. A regional strategy for improving the uptake of science into policy making must consider all of these arenas. The assignment of new and emerging issues such as sargassum to an IGO with a regular process for ocean issues could help ensure that they are taken up in established science-policy arenas.

The complexity of science-policy arenas in the WCR is likely to have considerable implication for efficacy of getting BASE into policy, as despite the existence of a variety of boundary spanning activities, the pathways from science producers to science users are often irregular, informal and unclear. While constraints imposed by this situation were not explicitly examined in this paper, it is inferred that it is likely to affect both science producers and boundary-spanners as they seek to engage with policy processes. Navigating this complex multi-organizational, multilevel system to ensure that advice reaches the appropriate forum and level requires understanding of the overall system, and the interaction among the IGO partners to determine entry points for science inputs. Developing and communicating this understanding is a key role for boundary-spanners.

The fact that a significant part of ocean governance policy in the WCR is externally driven, largely by UN organizations (e.g., FAO, UNEP, IMO, UNDOALOS) and global conventions (e.g., CITES, CBD, MARPOL) also contributes to the complexity of the science-policy arenas in the region. Of the regional integration IGOs, only the OECS Commission can be considered as having an indigenous subregional oceans policy. While the Caribbean Sea Commission of the ACS is in project implementation mode, neither CARICOM nor SICA have integrated ocean policy, despite prominent orientation toward Blue Economies for which such policies would seem essential (Clegg, 2021). The requirement to develop ocean policies formally informed by BASE by these IGOs would provide a clearer policy environment for boundary spanning.

In terms of strengthening the provision of accessible policy-relevant science, there is the need for science producers, their organizations (e.g., universities and research institutes) and their professional bodies (e.g., GCFI, AMLC) to develop mechanisms that provide more efficient access to their expertise and information. These mechanisms could facilitate establishing regional working groups to address specific problems and lead in turn to improved engagement within the science-policy arenas. Research institutions, especially in academia, could support this approach by giving researchers merit for engaging in science-policy arenas, and may find that policy-relevant science leads to increased funding. Ultimately, these mechanisms will come under the heading of boundary-spanning. There are examples of past and ongoing efforts in the WCR to build on and lessons to be learned from other regions as well.

No organizations established specifically for boundary spanning were found, and while boundary spanning activities were found to be taking place, largely informally, through efforts of a wide range of actors, there are significant gaps (Table 2). This role needs to be explicitly recognized and fostered by

IGOs and other research consumers; even to the extent of encouraging the establishment of organizations whose primary role is boundary spanning. Some IGOs cultivate relationships with science providers often admitting them as permanent observers to their meetings, while others seldom do, or do so only for specific topics for which the observers' input is considered necessary. A reorientation by IGOs to recognizing and encouraging brokers/boundary-spanners on a permanent and more integrated basis; indeed even strengthening their capacity, would enable them to better play their role and to engage in ongoing dialogue with both science providers and science users. This will also have the potential to move the science-policy relationship toward knowledge coproduction wherever appropriate and thus facilitate the incorporation of a broader range of BASE (Norström et al., 2020).

The diversity of ways in which boundary-spanning takes place in the WCR suggests that analysis of the effectiveness of boundary spanning activities in the region is needed to determine what works and what does not (Posner and Cvitanovic, 2019). In that way, rather than seeking to promote conventional approaches to boundary-spanning, WCR 'bright spots' can be identified and built on (Cvitanovic and Hobday, 2018). An analysis at the regional level regarding impacts of policy

advice similar to that done at the national level by Kushner et al. (2012), could contribute to understanding efficacy and best practices for boundary-spanners in the region. It could also serve to illuminate the role of boundary-spanners for IGOs so that they can consider how best to engage with them. As noted by IASS et al. (2020), the UN Decade of Ocean Science for Sustainable Development may provide the opportunity and resources needed to pursue strengthening science-policy arenas.

## DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

## AUTHOR CONTRIBUTIONS

Both authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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# Exploring the Nexus and Utilities Between Regional and Global Ocean Governance Architecture

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Regional and global ocean governance share complex, co-evolutionary histories in which both regimes – among others – interacted with and used the ocean and resources therein to consolidate, expand, and express power. Simultaneously, regional and global ocean governance relations have changed continuously, particularly when we are trying to understand their differences within the logic of *regionalisation*, *regionalism*, and *globalisation*. The paper is generally based on deductive reasoning and reflects scholarship in security studies, political science, international law, international relation, development studies, and African studies. It delves into the critical aspect of understanding the nexus/relationship between regional and global ocean governance in critical traditional and contemporary ocean policy domains, specifically from an African regional ocean governance standpoint. Ocean governance processes that are historically confronted by globalisation, multilateralism, and post-colonisation are confronted by the rise of regionalism, especially the need for nation-states and regions to respond to and manage traditional and emerging ocean challenges. Responses to these challenges by various actors, including states, economic blocks, private sector, financial institutions, and non-governmental organisations, development partners, etc., result in different forms of relationships that refocus regions' activities toward globally defined ocean agendas. A review of different policy domains (including maritime security, environmental, economic, and socio-political governance) critical for regional ocean governance sets a robust background for understanding the contextual factors and concerns inherent in the regional-global ocean governance nexus. These outcomes, therefore, help us to arrive at a five-fold taxonomy of different types/degrees of linkages developed around the regional-global ocean governance relationship spectrum described as (1) discrete, (2) conflictual, (3) cooperative, (4) symmetric, and (5) ambiguous. Comparatively, experience and perspective from Africa are utilised to support raised arguments about these linkages. Furthermore, this spectrum allows for the diagnosis of the utilities and most prevalent arguments that regional governance's effectiveness is directly related to the nature of the interaction between regional governance schemes and global governance; and vice-versa. This paper's outcomes

reveal how government, institutions, actors, and researchers address the relationship between regional and global ocean governance and generate a valuable way to think about current and future global and regional ocean governance direction while outlining some logical possibilities for an effective form of ocean governance.

**Keywords:** global ocean governance, regional ocean governance, ocean governance architecture, governance fragmentation, international ocean governance, Africa ocean governance, globalisation and regionisation – ocean development, regional and global ocean governance nexus

## INTRODUCTION

Enhanced and holistic knowledge of the ocean's system, including its physical and biochemical processes and socio-ecological characteristics, are imperative for achieving global ocean agendas and sustainable development (Österblom and Folke, 2013; citealpBR187; Adewumi, 2020a). However, there is a dearth of the needed information and knowledge to fully understand and govern the ocean (Halpern et al., 2019), coupled with an array of pressing issues confronting today's coastal and marine domains. Such issues include unsustainable exploitation of resources, climate change effects, specific regulation of activities in special issue waters (e.g., the Arctic and Antarctic). Issues such as states' competence other than flag-states in enforcement and compliance and biodiversity conservation in Areas Beyond National Jurisdictions (ABNJ) are also not left out. The proliferation of these issues indicates that ocean management is a complex web of interrelated, intertwined, converging, competing demands and interests (Futures Centre, 2015; Campbell et al., 2016; Grip, 2016). Evidence of these complexities is reflected in the fragmentation of today's ocean governance framework, arising from changing relations between the regional and global regime of governance and regional and global power in managing the ocean (Mahon, 2015; Wilson et al., 2019; IOC-UNESCO, 2020; see **Figure 1**).

However, the architecture of global ocean governance is defined as the roles of regional and global institutions and other actors such as states, Non-Governmental Organisations (NGOs), the private sector, financial institution, etc., participating in the governing of the ocean ecosystem toward sustainable development (Allison, 2001; Mahon and Fanning, 2019a; Petersson et al., 2019; Liss, 2020; Haas et al., 2021). Nevertheless, global governance and globalisation often drive ocean governance regulations, particularly in areas where ocean protection, economic, and security imperatives overlap in expected and unexpected ways. The global ocean space is currently regulated by upward of 576 bilateral and multilateral agreements, spread across several international, regional, and national organisations mandated to carry out monitoring and implementation, but which often lack the wherewithal to ensure compliance and enforcement (IOC-UNESCO, 2020). Since 2003, in response to the fragmentation in global ocean governance, an Oceans and Coastal Areas Network, "UN-Oceans" was approved by the United Nations High-Level Committee on Programmes to ensure stronger cooperation between entities and specialised agencies of the UN system with an ocean mandate (UN-Oceans, n.d.). However, due to lacklustre coherence with

other mechanisms such as the UN-Water and UN-Energy, UN-Oceans is considered insufficient to ensure coordination and promotion of synergy amongst the several agreements relevant to regulating the global ocean (Zahran and Inomata, 2012). This further entrenches the perceptions that global ocean governance mechanisms are too weak and cumbersome to deliver the urgent large-scale collective action needed to tackle oceanic problems.

More pragmatic approaches to national, regional, and global ocean governance are needed to ensure the effectiveness of ocean governance (Pyc, 2016; Rudolph et al., 2020), further substantiation of UNCLOS, and a holistic paradigm of sustainable development (Visbeck et al., 2014). Following the principle of subsidiarity, these global ocean frameworks' deficiencies indicate that several oceanic challenges can be better handled at regional levels to reduce the number of challenges handed at the international and supranational levels. After all, scholars such as Österblom and Folke (2013); Bodansky et al. (2014), Kacowicz (2018) note that the global view of regions is directly related to the possible interlink between regional and global governance. Also, by their nature, regional arrangements do not neatly fit into existing global arrangements, nor do they operate in isolation from a larger context of global governance (Väyrynen, 2003; Ba and Hoffmann(eds), 2005; Yilmaz and Li, 2020).

It is not just the fragmentation in the global governance regime that reveals the inherent footprints that globalisation maintains toward streamlining relationships between regional and global ocean governance. The normative understanding of governance and the connection between maintaining ecosystems sustainability and democratic values also play a role. According to Pickering et al. (2020), ecological and environmental democracy concepts already reveal the relationship between ensuring environmental sustainability while safeguarding democracy. Within a non-electoral and trans-national context, democratic practices and ideas are, in fact, critical to influencing the participation gap and politics of natural resources governance at all levels (Bäckstrand, 2006; Pickering et al., 2020).

Therefore, this paper examines the possible interplay between ROG and GOG from an African perspective, highlighting various identifiable elements that influence and remake regions and global institutions' roles in ocean governance. There have been minimal systematic studies of regional ocean governance in less developed countries where the benefits of globalisation are less obvious or are absent despite years of donor-oriented ocean management and governance programmes. Even less known is the effect of globalisation on Africa's regional ocean governance. Also, this paper focuses on Africa, where ocean governance



This paper focuses on three considerations to answer these questions. First, it supports and elaborates that various regional ocean governance mechanisms emerge from global forces, policies, and actions that fully or partially reshape the regions' activities toward the globally defined ocean or related agendas and rules such as the Sustainable Development Goals (SDGs) (Pyc, 2016; UNEP, 2017; Mahon and Fanning, 2019a). Second, it centres on how these dynamics and relations are influenced by international regimes and intra-regional conditions that define,

Based on the classification of the degree of fragmentation of global governance architecture by Biermann et al. (2009) and Nolte (2016), the paper proceeds to identify fivefold taxonomy

of linkages that signify the relationship between ROG and GOG: (1) discrete; (2) conflict; (3) cooperation; (4) symmetry; and (5) ambiguous. These classifications provide the basis for highlighting various utilities from the links or/and relationship between global and regional ocean mechanisms.

## GLOBAL AND REGIONAL OCEAN GOVERNANCE APPROACH AND ISSUES

Ocean governance is the process that ensures ecosystem structures and functions are sustained, including the coordination of various marine environmental protection and ocean uses (Pyc, 2016). Even though multilateralism appears to be increasingly important in today's globalised world, there have been consistent warnings that it is currently facing a legitimacy crisis, and hence, must be reshaped and readjusted (Zürn, 2003; Zürn, 2011) to meet 21st century environmental, social, and economic challenges. Attention has been called to the current deteriorating state of marine ecosystems (Blau and Green, 2015; Hattam et al., 2015; Pauli and Corbis, 2015). Improved governance has been touted to play a crucial role in halting the continuing and pressing marine challenges and developing a sustainable future for coastal and oceanic economies (Tarmizi, 2010; Al-Abdulrazzak et al., 2017). Töpfer et al. (2014) corroborate this argument, acknowledging that ocean governance is now at a critical point where existing institutions need to be redesigned to address current pressing problems. They stress that ocean governance is not an exception when it comes to institutional misfit, just as Österblom and Folke (2013) have earlier explained that today's ocean governance perhaps does not differ from happenings in other fields of global relevance.

Two distinct types of transnational ocean organisation are distinguishable. Firstly, organisations such as the United Nations Division of Ocean Affairs and the Law of the Sea (UNDALOS), International Maritime Organisation (IMO), Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (UNESCO), ocean-related units within the United Nations Environment Programme (UNEP), United Nations Development Programme (UNDP), United Nations Conference on Trade and Development (UNCTAD), World Trade Organisation (WTO), etc., provide the organisational and infrastructural support for the transnational ocean regulations. Secondly, other transnational organisations such as the International Union for Conservation of Nature (IUCN), the Ocean Conservancy, Conservation International, etc., focus on advocacy and influencing governmental coastal and marine policies by addressing transnational public opinion.

Nonetheless, global mechanisms for ocean governance have faced criticism. In the belief that existing international mechanisms need reform in the face of implementation deficiencies and lacunae arising from emerging unforeseen challenges during UNCLOS negotiations, Visbeck et al. (2014) envisioned a reinvigorated commitment to marine issues in the SDGs. Indeed, the derived commitments and focus of SDG 14 have since 2015 triggered the imperative for authentic

partnerships and increased international cooperation to have a coherent governance framework that can address the various coastal and oceanic challenges both at a national, regional or global scale. It is recognised that many ocean areas are insufficiently protected – particularly the high seas – raising the question that borders on either a lack of legal rules or shortcomings in how existing rules are implemented and further developed (Houghton, 2014).

Ehlers (2016) reported that ocean governance had been a magical word in recent times, indicating that a mere Google search for ocean governance returns a whopping 5.5 million results and posits four questions that would need to be answered, including: “Who is responsible for ocean governance? Are the individual states exercising their sovereign rights within their jurisdiction, and do these rights include freedom at sea? Is it enough that states at best cooperate constructively in intergovernmental organisations such as IMO? Moreover, is it enough to conclude international agreements leaving the implementation and enforcement to the states? Alternatively, do we have to find some new approaches by giving more competencies to international organisations?” These are the sort of questions that call for far-reaching and immediate answers. To Zürn (2011), the more international institutions dealing with ocean governance at the global level, the higher the number of collisions between different international regulations and national ones, a difference which only a supranational arbitration body can settle. Zürn is of the school of thought that the functioning of international institutions such as the United Nations does not meet democratic standards because of the absence of recognised decision-makers that could be held accountable for wrong decisions. Therefore, it is impossible to scrutinise the international decision-making process as prime actors in international politics are only accountable to a fraction of the people affected by their activities. The international community is conscious that improving global and regional cooperation should be in the mainstream of socio-economic and political discourse (Pyc, 2016).

Nonetheless, Pyæ (2011) and Houghton (2014) favour the development of standard rules to govern the coastal and marine domains. For ocean governance to be effective, Pyæ (2011) posits that there must be a global consensus on rules and procedures and regional actions based on shared principles and national legal frameworks and integrated policies. Developing these rules will require stepping back and looking at the legal rules system applicable to the oceans (Houghton, 2014).

Now that UNCLOS cannot meet today's ocean challenges and demands, rational use of our ocean calls for integrated maritime governance, understood as the processes of planning, decision-making, and management at the global level (Pyc, 2016). Under its articles 117 and 118, UNCLOS requires states to cooperate with others to conserve the high seas' living resources (UNEP, 2016). Over the years, the importance of regionalising ocean governance for more straightforward implementation of approaches have gained traction (Tutangata and Power, 2002; Gjerde et al., 2013; Rochette et al., 2015; Vince et al., 2017). This follows the reality that governance itself, in a universal sense, is the fragmentation of political authority stratified in seven

dimensions of geography, function, resources, interests, norms, decision making, and policy implementation (Krahmann, 2003). According to several scholars (e.g., Väyrynen, 2003; Henocque, 2010; Behr and Jokela, 2011; Börzel and Risse(eds), 2013; Nolte, 2016; Kahler, 2017; Grevi, 2018), the internationalisation of these governance dimensions has witnessed a sharp shift since the Cold War, giving way to regional characterisation in various forms, shapes, and span – transcending one issue areas, policy domain, institutions, norms, power, and discusses (Pattberg et al., 2014; Isailovic et al., 2013). Regional governance has emerged as a concept sufficiently broad and flexible to grasp the variable interaction patterns between global and transnational institutions (Nolte, 2016). The same goes for the ocean, where regional governance has become an indispensable part of the international ocean system, contributing significantly to the improvement and sustainable development of a globalised ocean (Borgese, 1999; Houghton, 2014; Werle et al., 2019b), as well as presenting new risks (Abbott et al., 2014; Campbell et al., 2016). They do so mainly through various mechanisms such as the Regional Seas Programme, Regional Fisheries Bodies, Large Marine Ecosystems (LME) Programmes (UNEP, 2016), and pursued rigorously by regions (European Union, 2017; Keen et al., 2018; EC, 2019). However, Mahon and Fanning (2019b) have opined that for a holistic approach in ROG to happen, concerns such as the composition of ROG arrangement worldwide, how they relate to GOG mechanisms, and each other should be addressed. This means that an understanding of the nexus, utilities and challenges of contemporary regional and global ocean governance and ROG is capable of accelerating an improved ocean governance system.

## MATERIALS, METHODS AND APPROACHES

The paper reflects scholarship in fields underrepresented in oceans research to set the foundation, shape the central arguments, frame the findings, and draw conclusion. These include applying findings and observations from the literature review of documents in different fields of studies, including security studies, political science, international law, international relation, development studies, and African studies. In his pioneering work on argumentation theory, Trudy Govier warned about the danger of choosing a deductive over an inductive argument and vice versa, claiming that it leads to false simplicity (Govier, 2018, p. 80). Nevertheless, this paper is generally based on deductive reasoning as various conclusion about the relationship between regional and global ocean governance are contained within the central premise that ocean governance at both regional and global levels exists within the sphere of political and economic ideas, characterised by dynamic power relations. This approach is appropriate for this study, considering that the contemporary social-science scholarship environment is leaning toward variable analysis that seeks to identify causal relationships, whether it is case-based or not (Cock and Fig, 2000; Darmofal, 2012; Nmadu, 2013; Vani et al., 2017; UNEP, 2018). Besides, this study is concerned with generating a new theory as it explores variables helpful in understanding what

might be expected within the ROG and GOG relationship given specific situations (see **Table 1**) or structures (see **Table 2**). It also generates a new understanding using prior research and approaches to hypothesise that factors such as history, democracy, characteristics of global institutions, states, actors, norms, and principles have implications on the ocean governance architecture pattern.

Acknowledging the complexity of ocean governance challenges (Campbell et al., 2016; Rudolph et al., 2020) and the paper's focus on the relations between entities (states, actors, institutions, norms, values, discusses, etc.), a relational ontology reasoning is adopted, which according to Soboleva (2020), provides relevance epistemic access to reality. Likewise, to examine the ROG and GOG system's fragmentation, the paper adopts ecological, political, and constructivist perspectives. An ecological, political economy perspective provides the epistemological foundation for illuminating research on why socio-environmental, socio-economical, and socio-political conflicts emerge at certain historical conjunctures in specific geographical and cultural contexts to spark ROG regime (Takeda, 2003; Bassett and Peimer, 2015; Quastel, 2016). Also, it helps us to understand how resistance ideologies against neo-colonialism, economic dominance, and dispossession are organised and sustained to influence new forms of ocean governance structure at a regional level – with emphasis on experience from Africa. Constructivists' perspectives offer elements to explain the phenomenon of growing political, social, and ecological concerns in the ocean governance policy domain. It posits that reality (be it social, political, or environmental) is a product of human knowledge, beliefs, or meanings (Bevir(ed.), 2010) and has been good in explaining fragmentation as a phenomenon (Isailovic et al., 2013). This perspective has been widely used in socio science studies to explore the critical interplay between political and socio-environmental governance issues, for example, in Maslow and Nakamura (2008); Ide (2016) and Jung (2019).

To address the linkages/relationship between ROG and GOG, the paper identifies the main issues of ocean governance and the different focus of emerging contestation over time in Africa. Following this, an assessment at the regional level is carried out as a heuristic tool by examining the context of ocean governance architecture trends, identify interactions, similarities, and differences between ROG and GOG systems without diluting the overarching conclusion by concentrating too closely on regional detail. It is building on Acharya's (2017) notion of a “multiplex world” that has accelerated various movements toward greater regionalisation. The choice of Africa is also based on several factors. First, this paper's author has a lived and research experience in the region – satisfying the constructivism perspective, which acknowledges the importance of pure experience derived from independent reality natural ideas (Bevir(ed.), 2010). Second, a scholarly lacuna warrants a concentration on Africa because stakes in Africa's ocean governance and policy are incredibly high. Out of 54 African countries, 38 are coastal or island states, while about 90% of imports and exports in Africa are carried out by sea (UNECA, 2016b). The livelihood and sustenance of a significant number of Africans also depend on ocean resources (Jarrett, 2017),

particularly as 66 million Africans are expected to live less than 100 m to the coast by 2030 and about 174 million by 2060 (Neumann et al., 2015).

## UNDERSTANDING GLOBALISATION, GOG AGENDA, AND THE MAKING OF ROG IN AFRICA

In an increasingly connected world lacking any central actor, there is a need to develop “ordered rule and collective action” (Higgott, 2002; Garrad, 2018; Grevi, 2018). Global governance provides the needed orderliness and collective actions with processes and institutions that seek to manage pressing global problems (adhering to the basic norms of international summits, decision making, and decision application). However, ensuring multilateral actions in governance constitutes *globalisation*, a continually evolving historical process that involves a critical shift in the human social organisation at a *spatial scale* linking and expanding power relations across and continents (Held et al., 1999; McGrew, 2017). From the mid-20th century, the sea has played host to states expanding their dominance to exploit all available resources, giving rise to trade globalisation (Houghton, 2014). The advent of UNCLOS has also created the “global commons” mentioned by Garrad (2018), with its ambiguous and defined global governance parameters. It has also increased demands on coastal and marine sectors of the variety of GOG institutions, most notably in conservation, shipping, and fishing. Besides UNCLOS and the 2015 United Nations Sustainable Development Goals, several efforts have been made globally in response to the marine environment’s challenges. They include the High Level-level Panel for a Sustainable Ocean Economy, the Global Ocean Commission, Friends of Ocean Action, the Global Ocean Alliance – 30 by 30 initiative, Global Ocean Accounts Partnership, etc. Many of these initiatives have their central focus on strengthening ocean policy frameworks and regimes while accelerating solutions to critical ocean challenges. UNCLOS and these other efforts have recorded some gains over the years, but there are still tremendous and critical challenges (Molenaar, 2019; Werle et al., 2019a).

Although UNCLOS has already presented a planet-wide ocean system governance in attending to the global ocean challenges, this is proving problematic. The clamour for ocean governance at a planetary scale makes two distinct arguments. The first argument concerns UNCLOS’s ambiguity, which has opened it to political debate and pressure on several issues such as its effectiveness (Mosso, 2018) and legitimacy (NISCSS, 2018). UNCLOS has been criticised on the premise that establishing regulations alone is not enough, but what is paramount is ensuring compliance with these regulations for effective implementation and enforcement (Ehlers, 2016). Secondly, nation-states cannot address and manage transboundary ocean challenges (van Tatenhove, 2017; UNDP, 2018) and issues in special area water such as the High Seas (Ringbom and Henriksen, 2017). This is because notable ocean challenges transcend national and regional borders (Goldin, 2013) and concern several players aware of their impacts (Garrad, 2018).

Although a unilateral world government is still farfetched, several global governance mechanisms operate in principle through conventions, protocols, and treaties. Still, in reality, these mechanisms evoke and reflect power imbalances among states (Campbell et al., 2016; Wilson et al., 2019), the divergence of views and understanding of oceanic problems, and regime shift in the ocean space (Rudolph et al., 2020; Spalding and de Ycaza, 2020). However, scholars have advocated for an integrated ocean governance approach through which centralised international ocean governance systems are operational under a single institution (Rudolph et al., 2020), or ocean polycentrism anchored in the strengths of existing arrangements while the UN play a leadership role (Fanning and Mahon, 2020). Nevertheless, what is the implication of these dynamics for regional ocean governance in Africa?

Theoretically, the concept of regionalism in the African context has provoked much political rhetoric and many academic debates (see Söderbaum and Grant, 2003; Gibb, 2009; Zajontz, 2013). Three predominant questions at the centre of the debate have been on ways to emancipate the African states from the relics of the precolonial and colonial-era; the understanding of intra-state power dynamics related to social, political, and economic conditions post-independence; and achieving regional cooperation and integration especially in solving problems related to economic, political, environmental or security issues (Börzel and Risse(eds), 2013; Ibrahim, 2013; Chirikure, 2017; Englebert, 2021). All the arguments point to one direction: globalisation has inherently not been kind to Africa.

The forces of globalisation have brought about anti developmentalism both in socio-economic, environmental, and political terms, particularly as they have reinforced the economic marginalisation of African states, negatively impacted the development and consolidation of democratic governance, and encouraged vices such as illegal drugs trade, prostitution, human smuggling, dumping of dangerous waste and depletion of the environment (Ibrahim, 2013). Mule (2001) explains that African countries are victims of economic imposition, hindering sustainable development and limiting gains realised from globalisation. African countries have suffered from the imposition of dissembling development models, strategies, and policies by the International Monetary Fund, the World Bank, and the WTO, with a significant negative toll on political, economic, and financial sovereignty (Due and Gladwin, 1991; Lundvall and Lema, 2014; Mendes et al., 2014). Starting in the 1980s, the World Bank and the International Monetary Funds’ Structural Adjustment Programmes (SAPs) had devastating social and economic consequences on the Africa states (Due and Gladwin, 1991; Mkandawire and Soludo, 1998; Heidhues and Obare, 2011). SAPs marked significant proof of how externalities of globalisation and attendant global capitalism propelled the African regional state’s shaping and indicated the need for African solutions to African problems. The multidimensional nature of contemporary regionalisation in Africa occurs in various forms, but it is mainly seen from an economic and financial perspective (Draper, 2010; Asongu et al., 2020). It also finds its interpretation in dominant regional integration theories, including neorealism, neo-functionalism

structuralism, etc. Often, the ocean domain's role in shaping the African region is ignored in scholarly analyses, yet global ocean regimes are involved in the making and breaking the region's present and future.

Global ocean governance impacts African states differently: It triggers competition among states and leads to new ocean-related forms of crises. African countries have used ocean issues to compete and accrue political leverage among themselves, although this a more significant issue, as seen in the South China Sea or the Arctic. For example, the Extended Continental Shelf regime adopted under the 1982 UNCLOS has increased African states' drive to increase their maritime domain, especially in their quest to explore and exploit known and anticipated mineral resources. Out of the 30 submissions (both complete and preliminary) made by African coastal states to extend their continental shelf after the 13 May 2009 deadline, nine contained potentially overlapping claims: Mauritania and Cape Verde, Senegal and Gambia, Ghana, Togo, Benin, Nigeria, Sao Tomé and Príncipe and Cameroon, Guinea and Sierra Leone, Gabon, Congo, Angola and the Democratic Republic of Congo, Namibia and South Africa, Mozambique and South Africa, Tanzania and Seychelles, and Kenya and Somalia (van de Poll and Schofield, 2010). This has created fierce competition and animosity amongst African coastal states as they strive to outsmart each other in providing scientific and technical evidence of the geological and geomorphological features of their prospective continental shelf. Likewise, commentators within and outside Africa think that instead of fortifying the African state, UNCLOS, in some ways, has bolstered the grip of international capital on the African state as they would have to depend on the Law of the Sea Tribunal or the International Court of Justice to seek redress. This would mean that a sizable amount of funds would be expended to file and hear a case at the Tribunal, including the costs of hiring competent Lawyers or Law firm, travel, accommodation, estacodes for government officials, etc. Webe (2012); Okafor-Yarwood (2015), Walker (2015); Moudachirou (2016) questioned UNCLOS ambiguities regarding maritime zones' delimitation, emphasising that it creates more problems than it resolves in Africa. Despite the safety nets for peaceful resolution of maritime boundary disputes provided by Article 298 of UNCLOS (Sim, 2018), maritime boundary disputes still pose the most dangerous potential for conflict between the African states. Several cases in question include the maritime dispute between Mozambique and Tanzania (Mlimuka, 1994), Nigeria and Cameroon (Merrills, 2003), Ghana and Cote d'Ivoire (Peiris, 2018), and recently between Kenya and Somalia (Bryant, 2021).

Apart from spurring competition, ocean issues have also enabled African states to act collaboratively at the regional level and forge a common position globally. For example, in the spirit of brotherliness, member states of the Economic Community of West African States (ECOWAS) agreed in 2009 to cooperate on issues of the limit of their extended continental shelf and write a "no objection note" to the submission of their neighbouring states.<sup>1</sup> Also, several bilateral agreements have been reached

between the African states to settle years of maritime boundary disputes. Some African countries have even gone a step further from the bilateral agreements to introduce a Joint Maritime Development Zone (JDZ) concept to manage the resources within the previously disputed area. For example, in the early 2000s, Nigeria and Sao Tome and Principe established a Joint Development Authority to manage the resources in the area where their EEZs overlap (Eze, 2020). Seychelles and Mauritius, in 2012, also adopted this model to manage the area of the seabed and its underlying sub-soil in the Mascarene Plateau Region (Kadagi et al., 2020). Likewise, the idea of a Combined Exclusive Economic Zone for Africa is under consideration as proposed in the 2050 African Union (AU) Integrated Maritime Strategy.

However, to a large extent, solidarity, collective awareness, and ubuntu's spirit<sup>2</sup> drive African states to survive the competition spawned by UNCLOS's boundary regime as; their drive to cooperate is solid because of their common struggle against slavery and colonial rule. This allows African states to present themselves as a voting block and a unified African voice during negotiations for ocean agreements and deliberation of global ocean governance initiatives. Following the 2010 introduction of the LMEs Concept as a tool for enabling ecosystem-based management in the world's ocean, African states positioned themselves as a formidable force in the LMEs discourses with the formation of the African LME Caucus. At their inaugural meeting in Accra, Ghana, in May 2011, the African LME Caucus set out goals and objectives to "establish closer cooperation between African LMEs, by discussing common concern issues, sharing experiences and developing strategies to work together" (African LME Caucus, 2011, p. 3). This group has represented the African LME projects' interests at the annual LME meetings and other international fora and has developed a paper on Africa's needs for a marine research platform. Prominently, the formation of the African Ministerial Conference on the Environment (AMCEN) in 1985 provided the necessary guidance and platform to articulate African interests in multilateral environmental agreements. In its objectives toward enhancing governance mechanisms for ecosystem-based management of the African ocean, the AMCEN has repeatedly called on various multilateral organisations and countries in the Global North to fulfil their ocean-related commitments. At the third meeting of the UN Environment Assembly (UNEA) held in December 2017 in Nairobi, Kenya, African countries through the AMCEN adopted 11 resolutions to accelerate action and strengthen partnerships on marine litter microplastics, among other challenges (AMCEN, 2019). AMCEN has also helped develop Africa's common position in climate change agreements producing a relatively new governance structure at the continental level, including the Committee of African Heads of State and Government on Climate Change and the African Group of Negotiators on Climate Change (AGN). Since the 1st

Submission by Government of Nigeria for the Establishment of the Outer Limits of the Continental Shelf of Nigeria pursuant to Article 76, paragraph 8 of the United Nations Convention on the Law of the Sea.

<sup>2</sup>Used in a more philosophical sense, Ubuntu is a Nguni Bantu term meaning "humanity" or sometimes translated as "I am because we are," or "humanity toward others."

<sup>1</sup>Minutes of Experts Meeting of ECOWAS member States on the Outer Limits of the Continental Shelf, Accra, 24–26 February 2009, Note 194/09 as part of the

session of the Intergovernmental Conference (IGC) on a new international legally binding instrument to sustainably conserve biodiversity in ABNJ under UNCLOS, the African Group has taken several positions on behalf of the continent. These positions are mainly related to the negotiation mode, monetary and non-monetary benefits, complementarity of Area-based Management Tools, traditional knowledge, EIAs requirements, financial, and social responsibility, etc. (IISD, 2018, 2019).

Sometimes, this solidarity also extends beyond the shores of the African continent to include Pan-Africanist<sup>3</sup> ideology. For example, in the build-up to the WTO's 11th Ministerial Conference held in late 2017, the African, Caribbean, and Pacific (ACP) Group of countries expressed their collective position on the negotiations for fisheries subsidies. They were sturdily against providing subsidies for large-scale commercial fishing activities but canvassed for support to developing countries and LDCs for coastal fishing activities related to artisanal, small-scale, and subsistence fishing within their EEZ (Bahety and Mukiibi, 2017).

Many ocean challenges in Africa have also been linked to global security concerns. The spate of illegal maritime migration, piracy and armed robbery at sea, IUU fishing, transshipment of narcotics, and other illicit maritime crimes has brought African countries face-to-face with international interventions and measures with significant implications on states' territorial integrity and sovereignty (Hamad, 2016; Brits and Nel, 2018; Okafor-Yarwood, 2020; Okafor-Yarwood et al., 2020). Measures such as joint military training exercises and intelligence gathering imply that African states and their citizens are constantly placed under surveillance, while foreign agencies and individuals are enabled to become surveillance states to protect "maritime assets." A particular case can be cited from the Horn of Africa. From 2008 through 2011, all eyes were on Somalia as it became the hotspot for piracy in the Gulf of Aden. The UN Security Council, through resolutions 1816, 1838, 1846, and 1851, made it its explicit purpose to protect the Gulf of Aden's maritime space at all costs by allowing warships to enter Somali territorial waters. This intervention turned Somalia into a chessboard for global superpowers and maintained their influence more broadly in the region (Weldemichael, 2019). Yet, the internal and external factors that allowed piracy to flourish in Somalia, such as illegal fishing by non-Africans, dumping of toxic waste, international shipping corridors, ineffective security structure, Eritrea's hostile relationship with Ethiopia, and Somalia's instability, were left unattended – prompting Menkhaus (2009) to argue that policies of Western countries helped fanned the flames of conflicts and insecurity in Somalia. Central, therefore, to Somalia's problems and the region is the inextricable relationship between the West's economic and political interests (Menkhaus, 2008; Beri, 2011), which explains why there was an international consensus to dominate Somalia's maritime domain at all cost. Several multilateral agreements and multi-stakeholder dialogues such as the 1992 Rio Declaration on Environment and Development; 1998 Convention on Access to Information, Public Participation in Decision-making, and Access to Justice in Environmental

Matters, commonly known as the Aarhus Convention; and 2002 Johannesburg World Summit for Sustainable Development have defined new forms of relations between actors at regional and international level. Furthermore, these global platforms have institutionalised multi-stakeholder processes for ocean governance at the regional and regional levels. For example, efforts to implement principle 10 of the Rio Declaration on public participation, information sharing and justice in the environmental matter are exemplified in several African high-level documents related to the ocean, including the 2003 African Convention on the Conservation of Nature and Natural Resource; the AU 2050 African Integrated Maritime Strategy; the AU Blue Economy Strategy; etc. African countries are now domesticating these efforts to strengthen public participation in evaluating Environmental Impact Assessments and Strategic Environmental Assessments. Madagascar now conducts a public hearing and seeks advice from concerned stakeholders before the developmental project is granted (IUCN, 2004).

## REGIONAL OCEAN GOVERNANCE: PERTINENT POLICY DOMAINS OF CONCERN

Various regional cooperation forms peaked around the late 1980s and early 1990s, particularly intense in the Global South, where different overlapping bilateral, sub-regional, and regional economic and security arrangements emerged (Kacowicz, 2018). In the realm of international law and policy, the development of regional governance for environmental protection and natural resources sustainability is considered to be a cornerstone (Rochette et al., 2015). Here, the author defines ROG as the institutionalisation and coordination of efforts geared at common coastal and marine challenges with cumulative effects and linkages to ecological, social-political, and economic issue areas, involving different actors, via binding or non-binding rules, regulations, actions, strategies, and policies that regionally mandated organisations enforce. Nonetheless, there is variation in the level of cooperation and coordination between ROG mechanisms (UNEP, 2016). Therefore, institutions saddled with ocean affairs responsibilities at the regional level take many forms with differing mandates.

In contrast, some are exclusively developed to attend ocean-related matters or passively engage in ocean activities as part of their much broader functions (Tarmizi, 2010). Considering the successes, challenges, cooperation efforts of available ROG mechanisms, three different structures are recognisable (UNEP, 2016): (1) Regional Seas programmes, many of them supported or coordinated by the UNEP; (2) regional fishery bodies (RFBs), some established under the framework of the United Nations Food and Agriculture Organization (FAO) while some are quasi-independent (e.g., Fisheries Commission of West and Central Africa); and (3) LME mechanisms, including projects supported by the Global Environment Facility (UNEP, 2016; Holthus, 2018; Adewumi, 2020b,c). Though there are other schemes of ROG in Africa, Asia, and the Caribbean, by far, the European Union (EU) case stands out—where ocean

<sup>3</sup> A belief that "African people, both on the continent and in the diaspora, share not merely a common history, but a common destiny."

policies increasingly incorporate regional measures, making regionalization of maritime governance more effective (van Tatenhove et al., 2015).

## Regional Maritime Security Governance

The concept of *security governance* and the notion of *security* entails the production of mechanisms steered by states and non-state actors (Kacowicz, 2018). Maritime security is a broad issue area in ocean governance. It encompasses physical, environmental, and human security at the coast and offshore. Regional security governance is supposed to contribute to a multilateral (global) security system (Söderbaum, 2016). However, the nature, context, and contemporary realities of maritime security governance at the regional level indicate that interventions carried out by regional apparatus, but within UNCLOS and international law framework are better to effect changes (Paik, 2005; Sandoz, 2012; RSIS, 2017). Also, despite several impediments confronting regional organisations (e.g., political will, coordination, funds, etc.), they have increased their relevance in maritime security issues, including piracy, armed robbery at sea, IUU fishing, narcotics, arms, and human trafficking in compliance with various international processes and institutions. On piracy and armed robbery at sea issues, regional actors in several hotspots have unfolded institutionalised maritime security architectures and coordination mechanisms that are not inspired by any UN Security Council resolutions but comply with other UN processes such as IMO. For example, Yaoundé Code of Conduct, the Heads of States Declaration and the Memorandum of Understanding between regional organisations initiated by the Gulf of Guinea Commission and leaders from the Economic Community of Central African States (ECCAS), ECOWAS, inspired the creation of the Yaoundé Architecture. It provides joint operations, intelligence sharing, and harmonised legal frameworks between West and Central Africa countries toward combating various illicit maritime activities. Besides these structured mechanisms, countries are also working on an *ad hoc* basis.

## Regional Ocean Environmental Governance

Improvements in managing and governing oceans help maintain ecosystems' integrity and upgrade ocean environments, thus building environmental sustainability (Millennium Ecosystem Assessment, 2005). As far as marine biodiversity is concerned, namely protecting and preserving endangered species or threatened ecosystems, existential uncertainties still abound and are yet to be adequately addressed by existing global/international frameworks. The responsibility to protect the marine environment effectively is at the centre of GOG (Töpfer et al., 2014). However, several loopholes exist within GOG mechanisms that have left the marine environment vulnerable to market forces. For example, UNCLOS's creation of the global commons opens the high seas to the danger of market forces (Thiele and Gerber, 2017), and the take on non-discriminatory trade-restrictive measures position of the

International Commission for the Conservation of Atlantic Tunas toward non-parties gives room for fishing interests responding to large markets to trample upon best conservation efforts (SITFGPG, 2006). Likewise, a range of market policy failures has encouraged under-investment or no investment at all in activities necessary to sustain the marine environment, while on the other hand promoting over-investment in activities that undermine the marine environment (UNDP, 2017). Ocean industries are often held accountable for their impacts on the ocean by both states and non-state actors (Holthus, 2018). Another dicey but apposite argument aligns with environmental and ethical concerns emanating from climate change and the ocean interplay. Garrad (2018) argues that global governance regarding environmental regulation now faces the increasing demand for balancing the development and industrialisation of emerging economies to manage global emissions.

Although environmental sustainability of the ocean is global (Visbeck et al., 2014; Holthus, 2018), the most effective and recognised approaches to combat the wide range of marine environmental issues (e.g., Ecosystem-Based Approach, Marine Protected Areas, Marine Spatial Planning) are normatively and contextually tailored to the needs, drivers, and aspiration of the people (Röckmann et al., 2017; Keijser et al., 2018). "One-size-fits-all" solutions for the ecosystem approach are neither feasible nor desirable (UNEP, 2016) because coastal areas and communities are vulnerable to changing environmental conditions and will have to prepare for and adapt to their effects (Avery et al., 2011). Hence, regional governance development to protect the environment and its biodiversity is unquestionably a cornerstone of international environmental law and policy (UNEP, 2016).

Fortunately, all regions have at least some arrangements covering specific issues or a wide range of issues relating to marine biodiversity, fisheries, and pollution, etc. (Mahon and Fanning, 2019b). For instance, under the Regional Seas Programmes, the Abidjan and Nairobi Conventions, in cooperation with other regional and international partners, are committed to advancing the Ecosystem-Based Management approach to ocean governance in Africa, applying marine spatial planning (MSP). Since 2017, the Abidjan Convention Secretariat currently co-implementing the Mami Wata regional MSP project (Mami Wata, 2018) has already constituted a Working Group to improve MSP regional capacity and share best practices. Meanwhile, decisions to support MSP development for sustainable development of the Western Indian Ocean's blue economy have been agreed upon by parties in the Nairobi Convention (UNEP-Nairobi Convention, 2015).

## Regional Ocean Economic Governance: Maritime Trade, Investment, Development, and Cooperation

Regional ocean economic governance is not a new topic. It has gained traction, particularly with the unsettled yet continued power imbalances and diffused international financial order (Girvan, 2007; Drezner, 2012; Boughton et al., 2017), as well as the recalibrations of regional integration rooted within the broader framework of social-political change and trade

liberalisation (Jones, 2001; Doidge, 2007; Jiboku and Okeke-Uzodike, 2016). The 2008 global economic crises exacerbated the former (Young et al., 2013; Boughton et al., 2017), while the latter predominantly emanates from the scope of *developmental regionalism* and the paradigm of *market-led regional integration* (Doidge, 2007; Draper, 2010; Jiboku and Okeke-Uzodike, 2016). Perhaps, one of the earliest official forms of regional ocean economic governance is the defunct EU Community Fisheries Agreements (CPAs) of 1976, which has now metamorphosed into the Common Fisheries Policy (CFP) (Failler, 2015). Other private regional economic governance also exists, for example, in the South Pacific, where some tuna agreements are managed by the Pacific Islands Forum Fisheries Agency, which since 1979 has facilitated regional cooperation (FFA, 2020).

Therefore, besides the growing importance of marine resources to regional economies, today's conception of regional ocean economic governance is a consequence of the fragile and uneven processes of global maritime trade and investment and the realisation of a new maritime trade and investment paradigm capable of keeping pace with regional economic realities, integration and interdependence. Hence, regional ocean economic governance could be an economic process in which internal and external states of affair pushes rapid growth in intra-regional maritime trade, investment, agreement, and interest at the expense of the region's maritime trade and investment with the rest of the world.

Although the wicked problems confronting today's ocean warrants global cooperation, the ability of multilateral trade and investment institutions to deliver the policy coordination needed to stem the tide appears sub-optimal. The existing multilateral trading systems (e.g., the WTO, the 2009 UN Convention on the contract of international goods transported wholly or partially by sea, the UN Convention on transit trade of landlocked states of 1965, and the Convention on the facilitation of International Maritime Transport of 1965) are only clasping under past successes. They have proved relatively ineffective in dealing with the global ocean economy's current challenges (OECD, 2016). For instance, the WTO has struggled over the past 20 years to end certain fisheries subsidies estimated at \$20 billion that directly contribute to IUU fishing, overfishing overcapacity (Sumaila et al., 2019; UNCTAD, 2019). *Ab initio*, the lack of clarity of the UNCTAD financing, trade, integration, technical assistance, and shipping policies have also been raised. The criticism includes that its resolutions, memoranda, and agreements have, in principle, hindered the desperate need for developing countries to expand exports, furthering the South and North divide (Howell, 1968; Anis, 1972; Ramsay, 1984). Likewise, the argument that global governance benefits powerful economies' interests in several ways is also recurrent (Graham and Litan, 2003; Maal, 2013). However, the COVID-19 pandemic has brought in a new form of cooperation between UNCTAD, Africa, and four other regions. UNCTAD has been working with the UN Regional Economic Commissions for Africa (ECA) on a three-cluster technical assistance project on transport and trade connectivity in times of COVID-19 to help countries "build better" in a Post COVID-19 world (UNCTAD, 2020). Also, African countries' stories of participating actively in the global

economy, but always marginalised and not benefiting fully, are not new (Ndikumana, 2015). This realisation has prompted the emergence of the agreement establishing the African Continental Free Trade Area (AfCFTA), a regional economic policy geared at easing international trading on Africa's market while projecting the continent as an active participant in the global economy (Fofack, 2018). It commits countries to become critical maritime trade partners due to what Asongu et al. (2020) described as "globalisation-fuelled regionalisation," focussing on the spirit of African solidarity, tariffs reduction, and the elimination of measures that inhibit cross-border trade.

## Regional Socio-Political Ocean Governance: Sustaining and Improving Livelihood, Preventing Irregular Migration, Integrating Integrity, Human Rights, and Gender

Response to security, environmental and economic needs is not what regionalism and regional governance are all about (Kacowicz, 2018). Addressing the dynamics of social, environmental, economic, and political processes is vital in improving governance (UNDP, 2017). Ba and Hoffmann(eds) (2005) opined that the extent of political exercise taking place makes us aware of regional governance's political aspects within the context of either conflict or cooperation. Perhaps, this is what prompted Avery et al. (2011) to believe that the prospect of future progress in ocean governance and strategies must fit within both social, economic, and geopolitical constraints.

In a 2017 report, the UNDP affirmed that ocean governance's essential issues relate to how various interests are represented and how decisions are made, and the roles of *power* and *politics* (UNDP, 2017). It is, however, clear that regions of the world (e.g., Africa, Europe, Southeast Asia, and the Americas) are all aiming at ROG systems that can be considered not only efficient in tackling 21st-century oceanic challenges but also enhancing social capital, promoting inclusiveness, sustaining democratic values, human right and legitimacy. According to Pendleton et al. (2015), the reasons for this are not farfetched: marine ecosystems are highly interconnected and are spatial units defined by specific characteristics; also, the management of human activities in the marine environment is organised along political boundaries.

Meanwhile, issues bothering irregular maritime migration have been pushed to the top of the political agenda in North America, Europe, and Australia with the global refugee regime facing profound and threats and hostility. Many so-called sustainable solutions offered by international organisations and migrant rights advocates are unfeasible and politically untenable (Carling et al., 2015). However, regional governance actions appear to be the best bet in solving irregular maritime migration issues, as the causes of these issues can only be fully understood and managed in the context of domestic politics (McAuliffe and Mence, 2014). For example, the Yaoundé Code of Conduct<sup>4</sup> provides a solid strategic and operational framework to curb the

<sup>4</sup>The Yaoundé Code of Conduct categorised illegal maritime migration as part of the "Illicit Maritime Activity" which includes smuggling of people and arms.

spate of illegal maritime migration within the waters of countries in West and Central Africa.

## THE NEXUS BETWEEN ROG AND GOG

Visbeck et al. (2014) and Töpfer et al. (2014) had earlier put forward what they perceived as the nexus and complexity between ROG and GOG. The former strongly argues that advancing a single (political or legal) global framework and coordination is needed for regional approaches to be practical due to ocean ecosystems' global connectivity. The latter posits that global authorities and frameworks operate in isolation and have failed to use their full collective potential, resulting in the lack of institutional cooperation at both global and regional levels. This section is mainly concerned with the central research question: what are the possible linkages between ROG and GOG? For this question to be answered, a fivefold taxonomy of links between ROG and GOG is developed using an analytical approach that draws ideas and concepts from several pieces of literature on institutional interplay, complexes, and fragmentation of governance (Abbott and Snidal, 2009; Biermann et al., 2009; Keohane and Victor, 2011; Pattberg et al., 2014; Nolte, 2016; Isailovic et al., 2013). The evidence from these pieces of literature enabled identifying some level of cooperation or conflict pattern between regional and global ocean governance regimes. At the same time, the systematic analysis presented in previous sections of this paper (sections "Regional Ocean Governance: Pertinent Policy Domains of Concern," "Regional Maritime Security Governance," "Regional Ocean Environmental Governance," "Regional Ocean Economic Governance: Maritime Trade, Investment, Development, and Cooperation," and "Regional Socio-Political Ocean Governance: Sustaining and Improving Livelihood, Preventing Irregular Migration, Integrating Integrity, Human Rights, and Gender") indicates the possible conflicts and synergies that exist between regional and global ocean governance (regarding divergent opinions, and principally in

response to the forces of globalisation, contextual challenges, and regionalisation push).

Biermann et al. (2009) proposed three criteria (the degree of institutional integration and degree of overlaps between decision-making systems; the existence and degree of norm conflicts; and the type of actor constellations) to describe the degrees of fragmentation in global governance as synergistic, cooperative and conflictive. Similarly, an account of other empirically driven attempts at defining various taxonomies of linkages in the international and emerging transnational level of governance exists – including the regime complex approach by Keohane and Victor (2011) and the governance triangle approach by Abbott and Snidal (2009). Keohane and Victor (2011) approach is based on the description of a continuum of regulatory systems being on the one end – fully integrated with a detailed level of rules, in the middle – “nested regimes with identifiable cores and non-hierarchical but loosely coupled systems of institutions,” and the other end – fragmented, weak and lacklustre.

Meanwhile, Abbott and Snidal (2009) focussed on emerging modes of governance within a transnational regulatory space bounded by voluntary norms and standard arrangements. Their governance triangle approach focuses on mapping the strength and weakness of participation of three key actors (or a combination of actors), including the national states, institutions, and NGOs, on identifying the categories of arrangements in a particular transnational governance architecture. Building on three criteria from Biermann et al. (2009); Pattberg et al. (2014), for their part, included “discourse constellations” as additional criteria to understand the causes of fragmentation in global governance architecture – implying the level of competition or overlap discourses within an issue area. These four criteria are employed in this paper as indicators or analytical dimensions to create the taxonomy of linkages between regional and global ocean governance architecture (see **Table 1**). These criteria are adapted because they focus on different explanatory variables (including the role of power, interest and knowledge) critical to understanding the differences between degrees of fragmentation in governance and have complementarities that

**TABLE 1 |** Criteria for analysing linkages between ROG and GOG architecture based on previous studies on the fragmentation of governance architectures by Biermann et al. (2009); Isailovic et al. (2013), Pattberg et al. (2014), and Kempchen (2018).

| Indicator                 | Explanation  | Expected direction of fragmentation   |
|---------------------------|--|---|
| Institutional integration | A catch-all word for clusters or collection of rights, rules, and decision-making procedures that give rise to social practices, assign roles to the participants in these practices and guide interaction. They are part of a global governance architecture of an ocean policy domain.   | The more overlap and collision between institutions dealing with early steps in the policy cycle, the more fragmentation.   |
| Norm conflicts            | Norms cover normative ocean governance frameworks, including legal norms and rules. They can be divided into constitutive and regulative, where constitutive bears more weight than regulative.  | When constitutive norms and rules overlap or collide in the ocean governance sphere, there is more fragmentation than if regulative norms overlap or collide.                             |
| Actors' constellations    | Ocean governance architectures consist of a myriad of actors and their relations forming actor constellations. These constellations can be international and transnational.  | High centrality and low level of average degree of participation indicate more fragmentation than low centrality and high degree participation.   |
| Discourse constellations  | Several discourses are expected to be present within ocean governance architectures, and some discourses to be dominant. Based on interests and beliefs, actors use narratives to frame their perceptions of “the problem” and its solutions at hand. The stories make up discourses that can be more or less dominant, which are expected to be found across four worldviews. | When there are several discourses active and no dominant discourse present, there is more fragmentation than if there is one prevailing discourse around which actors and norms converge. |

can conceptualise the nature, causatives and consequences of fragmentation in GOG.

However, to present the taxonomy of nexus between regional and global ocean governance, this section adopts the categorisation developed by Biermann et al. (2009) in their work on climate change governance and the Nolte (2016) study on comparative perspective in regional governance to distinguish between the different patterns of interaction between regional and global ocean governance. Biermann et al. (2009) differentiate between three different kinds of relationships that can occur in governance, including: (1) synergistic (in our case symmetrical), (2) cooperative, and (3) conflictive (in our case frictional). Nolte (2016) adhered to the synergistic, cooperative, and conflictive categorisation but introduced the fourth type of difference as “segmented” (in our case discrete) on the premise that consequences of fragmentation in governance might lead to neither cooperation, synergy, nor conflict but a new form of relationship between different governance components. However, the author adds a fifth category, “ambiguous,” arguing that the relationship between regional and global ocean governance is not clear-cut, particularly considering fundamental issues concerning past antecedents, trust, legitimacy, and national sovereignty.

Finally, a fivefold taxonomy of how the links between ROG and GOG is presented along the relationship spectrum being discrete, conflictual, cooperative, symmetric, and ambiguous (see **Figure 2** and **Table 2**). This typology represents a set of logical possibilities or hypotheses on what types of nexus exists and could exist between regional and global ocean governance. Evidence from literature, a systematic analysis of GOG in the face of globalisation and the emergence of Africa's ROG, and the general analysis of four policy domains of ocean governance mentioned earlier (maritime security, ocean environment, ocean economy, and socio-political dimension) lay the basis for identifying a typology of relationship between ROG and GOG mechanism. They provided the platform to diagnose the most prevalent arguments (e.g., Fazekas and Burns, 2012; Hofferberth, 2016; Meltzer, 2021) that regional governance's effectiveness is directly related to the nature of the interaction between regional governance schemes and global governance; and vice-versa.

### **Discrete: The Dominance and Strategic Nature of GOG Frameworks Tending to Limit ROG**

A discrete link between ROG and GOG is seen as a somewhat compulsive situation when (a) the norm, principles, and decision-making arrangements of GOG are satisfying, (b) regional institutions are too weak and need to rely on GOG to sustain them, and (c) credible alternatives are absent due to differing geographic, economic, and political interests. Though this might change due to shifting global dynamics (e.g., shifting geographic trade patterns, emerging economic powers, environmental dynamics, etc.), states in each region might connect directly to GOG rather than developing or strengthening regional schemes by themselves. The argument

here is that it is only logical that, provided that some GOG schemes are presenting satisfactory regulation and measures, the tendency will be for there to be a little drive for regions to contemplate establishing or nurturing new ROG schemes. An example of this is evident in the policy domain of maritime shipping and trade through the regulations of global frameworks such as the UN Convention on the contract of international goods transported wholly or partially by sea (2009 Rotterdam Rules), the UN Convention on transit trade of landlocked states (1965), the Convention on the facilitation of International Maritime Transport (FAL Convention-1965), and even the WTO). Although downturn cycles are typical in the shipping industry (Stopford, 2009), the industry was particularly hard hit by the last global economic meltdown 2008–2019. Interestingly, the dynamics of the global free market offered by the G20 (Group of 20) crept in, allowing the shipping industry to regulate itself over time from the market downturn and to restore its balance regarding operation activities and costs, earnings from operating activities (Bhirugnath, 2009). Contrarily apart from the EU, such proactive actions did not surface at the ROG level to salvage the shipping industry.

Also, the increasing availability of trans-continental groupings and alliances whose operations are based on sectoral issues and similar development concerns, rather than geographical proximity, might limit the proliferation of the regional ocean agenda on specific problems but could lead to silos. For example, the Africa-EU Partnership has some of its focus on maritime migration and mobility, strengthening maritime security and peace; likewise, the ACP Group of States addressing issues of mutual concern through the Cotonou Agreement.

### **Frictional Relationship: ROG as a Form of Partial Objection to GOG**

Here, a frictional relationship between ROG and GOG depicts a conflictive situation where an ocean policy domain is characterised by governance or institutional systems that: (a) are hardly connected or have different, unrelated norms and decision-making procedures guiding them, and (b) there are conflicting sets of drives and principles. The post-second World War and post-colonial era ushered in increased interest in national sovereignty and national governance capacity (Zürn, 2011; Held, 2018; Mahon and Fanning, 2019a). However, in the face of economic, social, environmental, and technological pressure and changes, the exigencies of “sovereignty” itself have begun to give way and become secondary, while the need for union and creation of international/supranational structures has heightened (Borgese, 1999). This is also exacerbated by the need to solve everyday challenges, especially those deemed transboundary. Hence, a frictional link between ROG and GOG appears to be a reactionary impetus to challenge what is perceived as towering supremacy, dominance, and subjugation of global mechanisms of ocean governance, and of course, coupled with the combination of regionalist/nationalist drive and need to overcome everyday challenges and capitalistic domination.

Nonetheless, propagating regional cooperation and developing regional [ocean] governance mechanism seems

like a logical policy embrace for countries in the Global South as a way of displaying independence and self-sufficiency (Kacowicz, 2018). Now, old top-down ways of working, in which international organisations see themselves as the primary sources of ocean governance approaches that are transferred to states (particularly in the Global South), are no longer valid (see Jamal, 2016; Walker, 2018). There is now a better understanding of how marine management is conceived, which recognises that approaches have multiple sources (WWF/UN-ESADSD, 1999, p. 7). Marine Management and governance are now seen as part of a collective effort to create new technical and social options that rely more on local knowledge and less on a “one-size-fits-all” formula. Hence, the development of ROG schemes that enhance working in partnerships has become much more critical. Recent developments, such as the adoption of the 2050 Africa Integrated-related Maritime Strategy (AIMS), indicate that African states are increasing their capacity to tailor effort to the needs and realities of the region amidst new, shifting global dynamics (e.g., patterns in geographic trade, economic powers, environmental dynamics, etc.). As proposed in the AIMS, the quest to establish a Combined Exclusive Maritime Zone of Africa (CEMZA) – a common African maritime space devoid of barriers – is a transformational concept aimed at accelerating joint management, intra-African trade, and making administrative procedures in intra-Africa maritime transport more attractive, efficient, and competitive, as well as to protect the ocean.

## Cooperative Relationship

The author speaks of a cooperative link between ROG and GOG when these ocean policy domains are characterised by (a) different institutions, actors, norms, principles, and loosely integrated decision-making procedures, (b) institutional norms and principles are related, and actors are unclear; and (c) there are core institutions that do not comprise all actors that are important in the policy domain. Also, the argument for this type of link is that ROG and GOG are in constant interaction, and a mutual relationship operates where the two systems are dedicated to addressing the sectoral or integrated marine issue(s), bringing individual experiences and resources, cross-fertilising ideas, and learning from each other (Campbell et al., 2016; Marine Regions Forum, 2020). Apart from the marine ecosystem not respecting respective national and legal boundaries, the oceans have connected cultures, civilisations, and commerce for a long time (McPherson, 1984; Al-Rodhan, 2017). The world has even transformed from being a “global village” to a “common area,” thanks to the advent of supercomputers and different cutting-edge technologies. This has aided networking between regulatory agencies, inter-government exchanges, and learning from counterparts (Zurn, 2003).

Therefore, the possible link between ROG and GOG might exhibit cooperation on common or overlapping interests and issues. This type of relationship has been more pronounced around maritime security and economic policy domains, maritime security and socio-political policy domains, and environmental and socio-political policy domain. With this type of relationship, policies are defined, decided, and monitored

through different or core GOG institutions and individual ROG institutions that might not be affiliated with the core GOG institution.

A look at the ocean space shows that parallel processes of ROG and GOG are geared at fisheries, maritime security, migration, shipping, and conservation. For instance, on shipping issues, regional and global governance might interact in complex ways where *ab initio*, the preconditions enshrined in IMO’s regulations and protocols, might set the tone for cooperation. When this global precondition merges with regional concerns and needs, there might be a reinforcement of the two systems leading to healthy and seamless cooperation and even institutionalisation. For example, the MoU on the Establishment of a Sub-regional Integrated Coast Guard Function Network in West and Central Africa led to strengthening cooperation between the IMO and the Maritime Organisation of West and Central Africa. This type of relationship becomes contrasting and complex on maritime security issues, particularly when issues of national sovereignty vis-a-vis dimensions of regional and global security come into play. A case in question is in the Gulf of Guinea, where countries in the region have countered any idea of a Gulf of Aden-styled intervention where foreign militaries were allowed to intervene against maritime piracy (Osinowo, 2015; Okafor-Yarwood et al., 2021). Also, cooperation between regional and global ocean governance in Africa is evident through UNEP and the AU. On many fronts, UNEP cooperates with the AMCEN to develop and implement different AU processes geared at integrated management and governance of Africa’s maritime domain. For instance, UNEP’s Regional Seas Programme – the Barcelona Convention, Abidjan, Nairobi Convention, and Jeddah Convention are recognised regional platforms through which the AU intends to implement its Africa Integrated Marine Strategy 2050 and its Agenda 2063 on Ecosystem-Based Management Approaches (including Marine Spatial Planning) for marine resources within Member State’s EEZ (UNEP- Nairobi Convention, n.d.).

## Symmetrical Relationship: ROG as a Component of GOG

The symmetrical relationship between ROG and GOG is conceived as situations when (a) the GOG includes (almost) all ROG mechanisms and (b) it provides for practical and detailed general principles that regulate the policies in different yet substantially integrated governance arrangements. The logic here is that ROG is a subset of GOG working in tandem in a synergistic relationship. This type of relationship allows for ROG initiatives to emerge into governance mechanisms recognised and embodied within the GOG arena. The importance of regional organisations and conventions for ocean affairs within and outside the UN system has grown as bases for action (Grip, 2016), where regional arrangements are connected to a global arrangement or programmes (Mahon and Fanning, 2019b). For example, Regional Seas Programmes, Regional Fisheries Management Organisations (FMOs), Convention on Migratory Species (CMS) MOUs, IMO Port State Control MOUs, etc., are all subsets of the UN ocean governance system. The need for this

is that local strategies and planning would be insufficient because of the dynamics of global influence conditioning the regional seas and oceans (Henocque, 2010). Embracing this link allows for two-way piping of knowledge and understanding about the ocean in terms of gaps, challenges, opportunities, current status, threats, and solutions (Durussel et al., 2018). This thinking is substantiated principally on the principle of subsidiarity or social organisation – positing that governance activities occur at the most practical level, whether local, national, regional, or global.

Concerning governance of the ocean arena, UNCLOS (Article 197) already set the tune for another kind of symbiotic relationship between ROG and GOG upholding that states shall cooperate on a global or regional basis, either directly or through international arrangements, in formulating and enforcing rules, standards, procedures for the management of the marine environment, taking regional characteristics and features into account. Therefore, GOG goals and actions should accentuate multi-layered and multilateral logic based on a harmonic relationship with the regions and their actors. For example, while providing a platform for regions and states to agree on fisheries management, RFMOs occupy a critical position in resolving fisheries crises, particularly per the 1995 UN Fish Stock Assessment Agreement.

Following the principle of subsidiarity, systems of ROG appear as building blocks of all-encompassing GOG. Regional Seas schemes such as the Abidjan and Nairobi Conventions supervised by UNEP; Regional Fisheries bodies such as the Sub-regional Fisheries Commission (SRFC), South East Atlantic Fisheries Organisation (SEAFO) supervised by FAO; and the GCLME, CCLME, BCLME facilitated by several UN agencies are another layer of stones in the overall architecture of GOG.

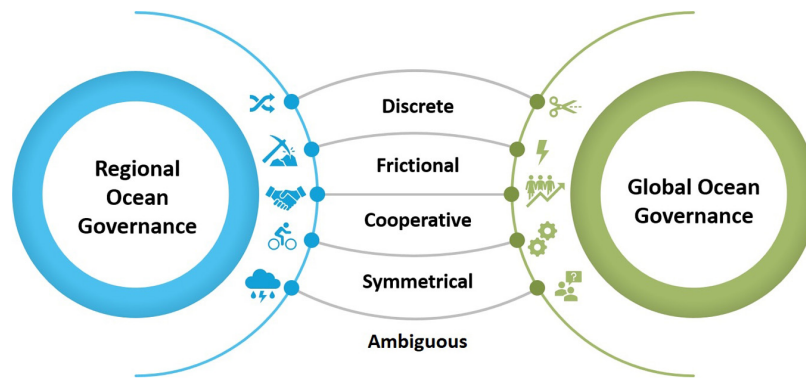
Likewise, as the timing of treaty development usually corresponds with global interest in each topic (Al-Abdulrazzak et al., 2017), the AfCFTA regime is symmetrical with rules of other multilateral systems in some aspects. Some substantive areas covered in the AfCFTA have made disciplines of the WTO part of the deal, such as the trade remedies, safeguards, and standard administration.

## Ambiguous Relationship: Bewilderment of ROG at the Shift of GOG Systems

An ambiguous relationship between regional and global ocean governance relates to the most contentious relationship between ROG and GOG, as it touches upon the most debatable issues of power, national sovereignty, trust, and legitimacy. Predominantly, it exemplifies the growing level of scepticism and hostility toward global institutions that several scholars have already documented (Ünay, 2006; Lundsgaarde, 2018; Cuervo-Cazurra et al., 2020). This reflection has increased the cynicism expressed in the Global South about the intentions, modalities, and instruments of GOG in dealing with specific localised maritime issues. The link between global and ROG has become shrouded in mistrust and unbalanced impressions of actors about GOG schemes' genuineness to tackle ocean challenges faced by the regions. According to EurekAlert (2018), this growing "zeitgeist of mistrust" allowed organisations such as the UN to be viewed as "meddling amid a geopolitical backdrop of cancelled treaties, neglected obligations, and frozen negotiations." Elements of an ambiguous relationship between ROG and GOG exist across the various ocean policy areas. It particularly occurs in regions where (a) national political and governance structures are on the brink of collapse, (b) respective schemes of GOG led by global powers have failed to include solutions to address underlying courses of problems in their political, development and social interventions, and (c) there is a level of mistrust and questions about the legitimacy of ocean interventionist approaches, procedures, and operations. Drawing on a political agency's relevant theories with particular attention to institution building concerning maritime security and economic trade and investment, Morton (2017) reveals inherent difficulties in balancing national security concerns and global trade and investment agreements. The maritime security situation in the horn of Africa appears to be one perfect example of an ambiguous relationship between global and ROG schemes. For instance, the Somali states appear to be volatile and incapable of protecting their maritime territory and citizens from threats. However, the

**TABLE 2 |** Explanation of the typology of linkage/relationship between the ROG and GOG architectures partly adapted from Biermann et al. (2009) and Nolte (2016) and further modified by the author.

|                           | Discrete   | Conflictual  | Symmetric   | Cooperative   | Ambiguous   |
|---------------------------|--|--|---|---|---|
| Institutional integration | Opposite institutions with no semblance of institutional integration         | Different, largely unrelated institutions  | A core institution, with other institutions being closely integrated          | Loosely integrated core and other institutions                              | Integration of core institutions based on external intervention             |
| Norm conflicts            | Opposite core norms  | To a certain degree, core norms conflict   | Core norms of institutions are integrated                                     | Core norms are compatible   | No clear distinction or understanding of core norms                         |
| Actors' constellations    | Major actors support different institutions                                  | To a certain degree, major actors support different institutions                                     | All relevant actors support the same institutions                             | Several actors remain outside central institutions but maintain cooperation | Some actors do not have any choice than to support one or more institutions |
| Discourse constellations  | No prevailing or dominant discourse cluster around which narratives converge | There is the same number of dominant and dormant discourse clusters around which narratives converge | One prevailing or dominant discourse cluster around which narratives converge | There are several discourses active and no dominant discourse present       | The prevalence of discourses is based on external discretion                |



**FIGURE 2 |** Nexus between ROG and GOG architecture with the degree of relationship and degree of fragmentation.

UNSC resolutions (1816, 1838, 1846, and 1851) allowed for several interventionist naval operations such as the Combined Task Force 150 (CTF 150), NATO Maritime Group 2 (SNMG2), etc. These, however, raised concerns about legitimacy, trust, and the fundamental principle of international law concerning the sovereignty of the state – and invariably gave way for a type of relationship indicating that the GOG regime is deliberately geared at undermining Africa’s maritime strategic interests. This is coupled with the fact that in the first instance, it was the illegal fishing activities of foreign vessels that gave rise to piracy off the Somalia coast as people’s livelihoods were being jeopardised (Venkataraman, 2016). Considering this type of linkage between ROG and GOG, Walker (2019) believes that “*Africa is often seen as nothing but a strategic blank space. While maritime security around Africa may be a subject for global discussion, African... are often seen as little more than passive actors; or Africa as an object for powers to use at their will.*”

Neither ROG nor GOG is static, and they can oscillate between these different types of relationships. This is because generally, the future of both regional and global governance will be shaped by factors such as individual empowerment, increasing awareness of human security, institutional complexity, a shift in global power, and liberal world political paradigm (Jang et al., 2016; Nolte, 2016). There might also be variations within the subtypes, such as with cooperative regional governance – with elements of conflict – or with conflictive regional governance co-existing with cooperation elements. Therefore, amidst ROG and GOG architecture fragmentation, some opportunities could be garnered from the observed relationship/links to improve both systems.

## UTILITIES OF ROG AND GOG

The advent of SDG goal 14 has triggered resounding local, regional, and international efforts toward solutions, cooperation, and agreement on the ocean’s formidable governance framework. Its implementation has also fostered the realisation of the three tenets of sustainability, allowing for the proliferation of integrated ocean management approaches. Despite some

identifiable positive and negative relationships between ROG and GOG, these two ocean governance schemes’ utilities are evident, as explained in previous sections of this paper. They should be useful in resolving and fostering continued cooperation in managing today’s coasts and oceans.

## Solving Wicked Ocean Problems

We live in a connected world where global and local exigencies’ dynamics converge and resonate across the spectrum. The same goes in the maritime domain, faced with various multi-layered real-world problems (plastic pollution, IUU fishing, climate change, habitat degradation, species extinction, etc.) cutting across economic, social, and environmental divides; spatial and ecological scales (both in space and time) – and almost deferring solutions. This proposes a confirmed case of a wicked problem, as the severity of ocean problems is still not fully understood. According to Paasche and Bonsdorff (2018), there is no backdoor out of this wicked problem. The link between ROG and GOG schemes has increased the adoption of collaborative approaches such as Marine Spatial Planning, a part of the “clumsy” solution identified by Hartmann (2012) through which wicked problems can be identified and solved.

## Continued Evolution Toward Adaptive Ocean Governance

Cooperation between organisations is not only needed because of overlapping issue areas, conventions, or the interconnection between ecosystems. Cooperation is needed because of different responsibilities regarding a wide range of activities in and around the oceans (UNEP, 2016). In recent years, we have seen the relationship between ROG and GOG evolving both positively and negatively. Socio-ecological system governance (stewardship) is emerging to be adaptive enough to curb the wicked problems posed by 21-century interactions between society and the ocean. This breath of fresh air can be felt already from the ongoing BBNJ negotiations – requiring concerted efforts from actors and management convergence (Houghton and Rochette, 2014). It shows that ocean governance challenges can, to a great extent, be collectively addressed through constructive cooperation (Töpfer et al., 2014).

## Realisation of Inclusive Ocean Governance Needed to “Build Back Bluer” During and Post-COVID-19

Regional-GOG relations are critical and necessary to ensure sustainable development in oceanic space, considering today's emerging trends and challenges. Indeed, the COVID-19 pandemic has generated a new quest for institutions globally, and the world is entering critical periods beyond this pandemic. This pandemic is currently affecting every ocean sector, society – and we will see the exacerbation of competition for coastal and marine resources post COVID-19. Therefore, a workable relationship between ocean governance mechanisms at the regional and global levels will enable the world to react to changes in shipping, tourism, fishing, research, etc., and shape and mainstream their responses to supporting mitigation and control recovery efforts.

## CONCLUSION

This article has outlined three contributions to better understanding the bare and complex linkages between ROG and GOG architecture from a theoretical and practical perspective. First, it brings to the fore the necessary debate about regionalisation, regionalism, and globalisation and indicates a wake-up call for researchers and professionals to develop new approaches to the study of ocean governance. The first part of this article discussed some of the critical concepts of region, regionalism, regionalisation, and globalisation from various disciplines to find parameters for use in the current debate on ROG and GOG. Understanding the interface between region/regionalisation/globalisation and ocean governance offers an essential piece of information to substantiate the call by Campbell et al. (2016); Werle et al. (2019b); Rudolph et al. (2020), etc., for new mechanisms in the transition to sustainable ocean governance. Also, the use of “policy domains” as an element in thinking about today's ocean governance architecture as well as “factors of governance fragmentation” (institutional integration, norm conflicts, actors, and discussion constellations) has helped to emphasise the pertinent and impertinent aspects that underlie the development of ROG system in the current period of globalisation.

Secondly, the article posits an alternative argument that privileges politics and the global market as an antecedent factor shaping ROG and GOG. This paper's analysis and discussion show that the ocean governance climate is characterised by traditional pseudo-multilateral, market-oriented, and national-state mechanisms. Therefore, shedding more light on these linkages from a regional perspective and illustrative examples from Africa has helped to understand and identify ocean policy domains with current or potential conflict and cooperation and domains where a different ocean governance approach is needed. By presenting fivefold taxonomy of the nexus between ROG and GOG architecture (discrete, conflictual, symmetric, cooperative, and ambiguous), new explanations are now offered to make sense of the type of linkage as a function of the

ocean policy domain in question, the role of historical events, regional and global powers in ocean governance; and factors such as institutional integration, norm conflicts actors and discourse constellations.

Though the common ground for a cooperative relationship between ROG and GOG is always there, it is still evident that power, influence, and sincerity of purpose and trust are sometimes in favour or against any one of the systems. Also, the factor of competitiveness could set in with two dimensions, either creating a healthy relationship where the two systems complement each other or an anarchical relationship because of mistrust and undue advantage, particularly on overlapping interests. Making this type of relationship a win-win will entail investing and placing a premium on building institutional arrangements, embracing delegation, and designing instruments to formalise cooperation (e.g., Memorandum of Understanding, Agreements, etc.) instead of acting unilaterally and uncooperatively. The way the African ocean governance experience relates to ROG and GOG's general phenomenon is an essential field of research that can be adapted to use in other places. This corroborates Andrew's (1994) and Kacowicz's (2018) observation on the lack of comparative examples and the prevalent notion of understanding other regions and the view of regionalisation through the “distorting mirror” or paradigmatic example of Europe. However, it would be helpful to tailor further research into developing an integrated framework to ascertain and measure the precise degree of ROG and GOG architecture relationship from various regions' perspectives. This is necessary to (1) identify different commutative and analytical problems associated with ROG and GOG fragmentation using several approaches, tools, and policy domains, and (2) address the full spectrum of complexity associated with ROG and GOG in general theoretical terms.

Thirdly, as the article shows, understanding the advantages and disadvantages of the existing relationship/fragmentation between ROG and GOG architecture has become an essential element and are opportunities for continued cooperation in managing today's coasts and oceans. These utilities or opportunities appear to manifest themselves in different forms passively/reactively and actively/imaginatively, depending on the locus of change in the ocean policy domain and typology of the relationship between ROG and GOG architecture. For example, following Hunter (2012), harnessing the relationship between ROG and GOG provides “*allocative based opportunities* such as *ensuring continued evolution toward adaptive ocean governance* and *diffusion of ocean knowledge*.” Considering that the imperfections between the two regimes are the crucibles in which creative solutions, integrated and transformative marine governance can be developed, and wise trade-offs among competing objectives are made (Kelly et al., 2019; Marine Regions Forum, 2020). Also, the relationship between ROG and GOG offers *discovery-based opportunities* such as *solving wicked ocean problems* and *realisation of inclusive ocean governance needed to “build back bluer” during and post-COVID-19* – as both regimes understand the attributes, the challenges and are aware that practical cooperation is essential in anticipating as well as solving them.

Summarily, it can be deduced from the article that there lies a complicated conundrum about the nexus between ROG and GOG architecture based on divergent opinions, creating a complex disjuncture in ocean governance at regional and global levels. Therefore, how researchers government, institutions, and actors address these nexuses will establish whether a fragmented ROG and GOG order or a more effective form of ocean governance emerges over the next decade.

Fortunately, momentum to better understand ocean governance variations is growing in Africa due to numerous initiatives in the region, such as the AU's 2063 Agenda, African Integrated Maritime Strategy, African Blue Economy Strategy and the African Continental Free Trade Agreement, and the need to confront and harness the region's yearnings for development. Moreover, a diverse range of institutions now exists to lobby for the ocean and coast, including the African Marine Environment Sustainability Initiative (AFMES), Coastal Oceans Research and Development – Indian Ocean (CORDIO), South African MPA Forum, the Coalition for Fair Fisheries Arrangements, the LME-Africa Caucus, the African Group of Negotiators on Climate Change (AGN), etc. We need to transition to an ocean governance architecture that can adapt to the Blue economy's needs and constraints. One that requires innovative solutions and careful management systems to ensure long-term sustainability and implementation of national and international regulations and instruments to address current challenges amidst new, shifting global dynamics (e.g., patterns in geographic trade, economic powers, environmental dynamics,

etc.). By implication, proposals and strategies for future ocean institutional development explicitly or implicitly assert the value of the divergent relationship between ROG and GOG – either in support of an integrated overall architecture or otherwise – need to start trickling in.

## DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

## AUTHOR CONTRIBUTIONS

The author confirms being the sole contributor of this work and has approved it for publication.

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# Polycentric Regional Ocean Governance Opportunity in the Benguela Current Convention

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The Benguela Current Convention (BCC) has been operational for a decade and has emerged from the precursor natural and fisheries science large marine ecosystem programs. This regional ocean governance institution emerged indigenously as an intergovernmental working arrangement across the Republics of Angola, Namibia, and South Africa. The Convention has been described as a Centralized Authority mode of regional ocean governance. This paper explores this description with reference to the ecosystem-based approach to marine management. The study is focused on the level of working arrangements within the Convention and its Commission across the national and regional scales. It finds that the BCC does meet the theoretical criteria of a polycentric governance mechanism at the resolution of its operations. Polycentric ocean governance mechanisms are valued in regional ocean governance as they potentially offer greater impact through higher levels of coordination, codesign, and integration. Polycentric governance systems incorporate multiple centers of authority that operate at different scales. Existing instances and further opportunities for polycentric governance mechanisms within the working arrangements of the Convention are identified for the Southeast Atlantic.

**Keywords:** polycentricity, Benguela Current Large Marine Ecosystem, transboundary, ecosystem-based approach, ocean governance and management

## INTRODUCTION

Regional ocean governance institutions are being evaluated to assess their role as linking conduits between global ocean governance institutions and national institutions. The Benguela Current Convention (BCC) is one such regional ocean governance mechanism operating in the Southeast Atlantic and covers the national jurisdictions of the three party states. The Convention came into force in 2013 when the Republics of Angola, Namibia, and South Africa deposited the instruments of ratification. The Convention is silent on accession by other states, organizations, and entities. The Benguela Current extends southward of South Africa interacting with the Agulhas Current and the northern extension of the Current occurs north of 10° S (Koseki et al., 2018). This is the boundary zone between the Benguela ecosystem of the South Atlantic and the tropical/equatorial Gulf of Guinea system. The oceanographic influence of this zone possibly extends to the Cabinda Province

of Angola and may then include the Democratic Republic of the Congo (DRC). The DRC although a relatively large country has a narrow coastline of about 40 km compared to much longer coastlines of Angola, Namibia, and South Africa. The Convention creates a governance structure around the Benguela Current Commission where the three countries are formally represented through Commissioners. The work in the Commission is directed by an Inter-ministerial Conference that is also created by the Convention as a permanent structure.

The first Strategic Action Program (SAP) of the Convention was signed by 12 high-level government representatives. These included four per country with Angolan and South African representation being at Ministerial level, while Namibian representation was at Deputy Minister and Permanent Secretary level. Government political portfolios covered by these high-level representatives ranged across marine living and non-living resources as well as environmental management. The history and organizational structure as set out by the Convention is described in Hamukuaya et al. (2016). The political support is evidenced in Neto et al. (2016), a paper co-authored by some of the ministerial representatives from each of the countries.

The Benguela Current Large Marine Ecosystem is described as the “ecosystem associated with the Benguela Current and characterized by distinct bathymetry, hydrography, productivity, and trophically dependent populations” (Benguela Current Convention, 2013, art. 3). The area of application of the Convention is described as extending from the high-water mark to the limit of the areas within national sovereignty and jurisdiction, as defined by the United Nations Convention on Law of the Sea (UNCLOS) for the three countries that are party to this Convention. This includes all territorial waters and ocean spaces claimed as Exclusive Economic Zones. BCC party states are in various stages of the Extended Continental Shelf Claim procedure afforded by the UNCLOS. This will expand the direct influence of the Convention.

The BCC states its aims around the central theme of ecosystem-based sustainable development and management. The stated Objective of the Convention is captured as: “promote a coordinated regional approach to the long-term conservation, protection, rehabilitation, enhancement, and sustainable use of the Benguela Current Large Marine Ecosystem, to provide economic, environmental, and social benefits” (Benguela Current Convention, 2013, art. 2).

Two recent studies of regional ocean governance mechanisms advocated for more theoretical exploration of governance conceptualizations (Mahon and Fanning, 2019a,b). One of these review papers presents a Governance Modality Spectrum which illustrates a classification of categories of governance modalities or types. The authors classify several existing regional ocean governance arrangements into these modalities. The BCC was described in this spectrum as falling within the Centralized Authority modality (Mahon and Fanning, 2019a).

This paper responds to the call for higher resolution case studies of indigenous or regional ocean governance institutions. It examines the theoretical concept of polycentricity with regards to the BCC and investigates its classification as a Centralized Authority.

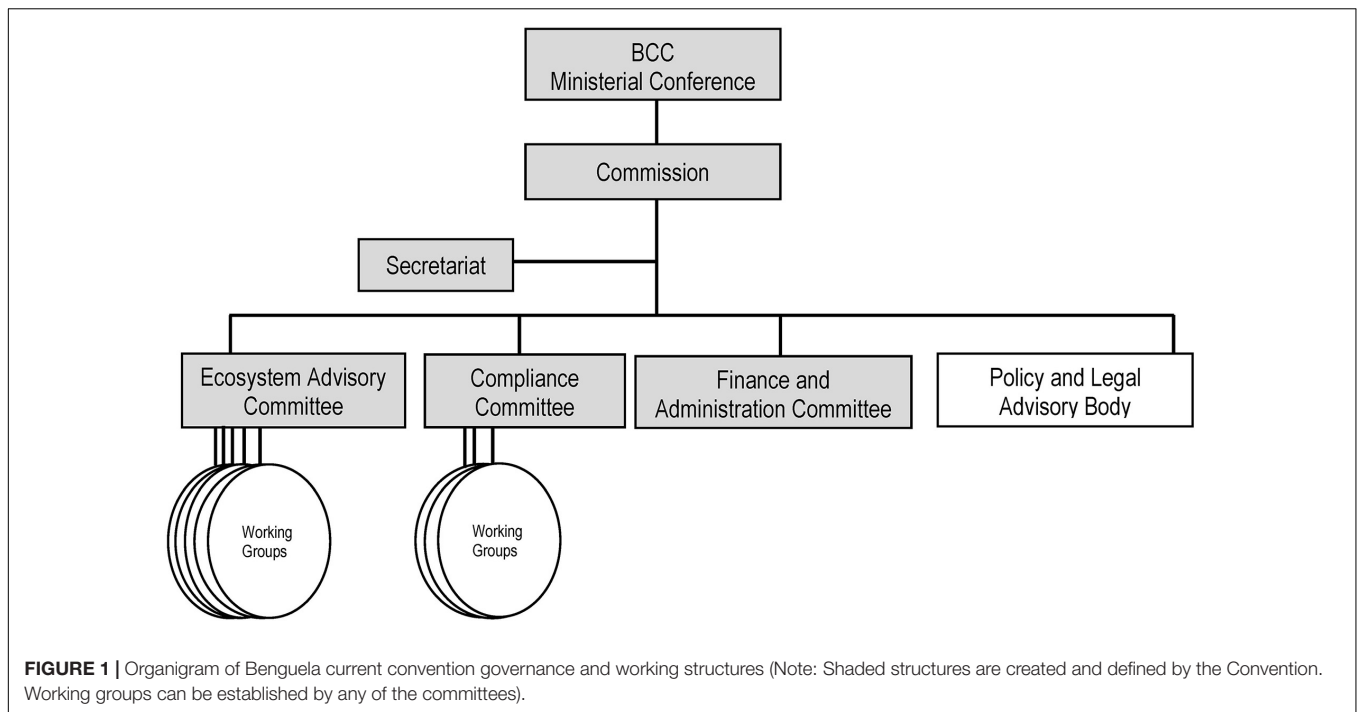
The BCC and its implementing structure and mechanisms are investigated for polycentricity through the proposed Governance Modality Spectrum. The polycentric criteria of multiple centers overlapping with a common cause is applied to the structure and functioning of the Convention's operational structures. Transboundary ecosystem-based management (EBM) is used as the common cause on which the BCC ocean governance is assessed.

Ecosystem-based management is selected as the common cause because it is the stated objective of the BCC. The implementation of EBM in regional ocean spaces will be necessary to meet the globally agreed sustainability targets. Sustainability is the intended outcome of environmental governance. The United Nations formulated Sustainable Development Goals (SDGs) present the most recent common framework of ambitious targets to address the interconnectedness of poverty, hunger and human well-being to sustainable use of the natural environment. The seventeen SDGs recognize the role of the oceans generally, but specifically within the SDG 14: Life Below Water. This Goal includes 10 thematic areas ranging from sustainable fisheries management, ecosystem and biodiversity protection, pollution impact, specifically ocean acidification and plastics, and fair accessing of benefits derived from the ocean. Progress toward the SDGs will require greater transitions toward sustainable ocean governance (Rudolph et al., 2020). Effective ocean management requires integration around an EBM approach (Winther et al., 2020a,b). Polycentric governance discussions present one mechanism for assessing horizontally and vertically integrated management across various ocean sectors.

## THE GOVERNANCE STRUCTURE OF THE BENGUELA CURRENT CONVENTION

The Convention establishes the Commission and sets out the objective, area of application, principles, operational structures, and rules of procedure. **Figure 1** adapts a previous organigram to include the newly established operational structures that are not defined in the Convention (Hamukuaya et al., 2016). The Ministerial Conference is the highest decision-making component of the Convention and is expected to meet every 2 years. This Conference approves the strategic political direction of the Convention, work programs and budgets submitted by the Commission. Like all structures of the Convention, this Conference is chaired on a rotational basis by each of the party states. Government ministers are the expected participants in the Conference.

The Commission meets annually and provides strategic direction in the formulation and implementation of the work plans and budget. The Convention defines the tasks of the Commission as establishing transboundary actions that may be required to meet the objectives of the Convention such as pollution mitigation interventions, conservation and management measures, or any sharing arrangements for fishery



resources. Commission level representation to date has been at senior government official from Director and above.

The Secretariat, headed by the Executive Secretary, is the administrative support unit of the Commission. It seeks to implement the strategy, business plans and budget adopted by the Commission and the Inter-ministerial Conference. The Secretariat also has the key function of sourcing additional funding for programs approved by the Commission. Each state party is expected to pay an annual contribution via the Secretariat. The annual contribution amount is approved by the Commission and is primarily used toward the funding of the Secretariat operations and core staff.

The Finance and Administration Committee serves to develop financial management policy and audit processes. This Committee also works with the Secretariat to develop and recommend annual budgets to the Commission.

The Compliance Committee collates information and makes recommendations to the Commission on compliance measures, specifically toward coordinating these across the three party states. This Committee also seeks to coordinate such activities with the other Committees reporting to the Commission. The Compliance Committee will be a key functional unit if the Commission were to implement any regional compliance or reporting programs.

The Ecosystem Advisory Committee (EAC) has two major functions. Firstly, it must establish and manage a science program. Secondly based on science and information, the EAC must develop and recommend management measures to the Commission.

The Commission, in addition to the defined structures, has created the Policy and Legal Advisory Body (PLAB) and potentially 14 Working Groups. The Convention allows for the

creation of subsidiary bodies in terms of Article 8n. The PLAB provides policy and legal advice to the Commission on both corporate administrative issues as well as ocean and ecosystem governance matters.

Existing and planned scientific working groups include the Small Pelagic Fisheries, Demersal Fisheries, Top Predators, Environmental Monitoring and Assessment, and Climate Change. While not undertaking science investigations directly, the Science Infrastructure and Logistics, Data and Information, and Training and Capacity Development Working Groups also function to bring together country experts on these topics. More recently the Regional Ecological and Biological Significant Areas (EBSA) and Marine Spatial Planning (MSP) Working Groups were also established under the Marine Spatial Management and Governance Program (MARISMA) project. The Working Groups function to identify issues, undertake collaborative studies or investigations and report to the EAC on possible interventions. The Compliance Committee has initiated the creation of four working groups: Ballast Water, Pollution, Fisheries, and Oil Spills.

The flow of communication is bi-directional for all the linkages. The strategic direction flows from the Ministerial Conference to the Commission and its sub-structures. Scientific and other technical advice flows from the Working Groups via Committees to the Commission. The Commission then interacts with the Inter-ministerial Conference on such ecosystem management advice.

The party states can nominate officials from any of the represented ministries and their associated departments to these formal structures and working groups of the Commission. **Table 1** illustrates the Government Department Representation by the party states, as identified from the signatories to the

SAP (Benguela Current Commission Strategic Action Program 2015–2019).

The three BCC party states are also party to various international and regional agreements. International agreements that Angola, Namibia and South Africa are party to include the United Nations and global multilateral agreements such as the Convention on Biological Diversity (CBD) and the Framework Convention on Climate Change (UNFCCC). All three countries are members of the International Seabed Authority (ISA) and International Maritime Organization (IMO). While there is no regional agreement on ocean mining guidelines, the ISA does undertake discussions on best practice and risk mitigation further to its permitting functions.

Regional agreements in which the BCC party states participate are summarized in the Transboundary Waters Assessment Program (TWAP) and include COMHAFAT – Ministerial Conference on Fisheries Cooperation among the African States Bordering the Atlantic, ICCAT – International Convention for the Conservation of Atlantic Tunas, SEAFO – South East Atlantic Fisheries Organization, and the Abidjan Convention and Protocols (Fanning et al., 2015). The TWAP did not include the Southern African Development Community Fisheries Protocol. Angola, Namibia, and South Africa are signatories to this Fisheries Protocol. Namibia and South Africa also participate in CCAMLR – Convention for the Conservation of Antarctic Marine Living Resources. All three BCC states are members of the Food and Agricultural Organization of the United Nations (FAO) which promotes coherence in fisheries management and monitoring and ecosystem approaches to fisheries management. The three party states have also acknowledged the need to implement an Ecosystem Approach to Fisheries Management (Shannon et al., 2004; Cochrane et al., 2009; Jarre et al., 2018; Kainge et al., 2020).

## POLYCENTRICITY, GOOD GOVERNANCE, AND EFFECTIVE GOVERNANCE FOR ECOSYSTEM-BASED MANAGEMENT

Polycentricity, as a concept, is often used in Euclidean geometry to denote structures or shapes with multiple centers. The Mahon and Fanning papers argue that effective transboundary

ocean governance requires polycentricity as effective governance must incorporate local, national, regional, and global agendas. This vertical integration must be balanced with a horizontal dimension across institutions exercising authority over the various active sectors in the ocean space. The influence across these various centers must be bi- and even multi-directional. A critical measurement of management effectiveness is that the polycentric or overlapping management interventions must cumulatively advance one or more common causes or outcomes.

Mahon and Fanning (2019a) draw from climate change governance considerations and using a more liberal approach to the overlapping or polycentric criteria propose a five-phase Governance Modality Spectrum. Their definition of polycentricity considered is “all systems comprising multiple governing arrangements under a common set of rules.” Their Governance Modality Spectrum progressed from Centralized Authority to Polycentric Fragmented, Polycentric Bricolage, Polycentric Codesigned, and Functional Polycentric. Centralized Authority arrangements are hierarchical in nature, with a single authority that directs all activities. The remaining four modalities are differentiated from the Centralized Authority in that they have multiple centers of authority. The differentiating characteristic among these are the levels or complexity of interactions and codesigned integration. Fragmented Polycentric demonstrates very little interaction; Polycentric Bricolage has an emerging or operational coordinating body; Codesigned Polycentric offers evidence of coexisting authorities’ intentions to design an integrating mechanism; and Functional Polycentric implements an operational codesigned integration mechanism.

In presenting the Governance Modality Spectrum the paper clarifies its assumption that moving toward functional polycentricity will realize more effective governance and implementation of EBM.

Effective is differentiated from good governance in studies on governance including those on regional oceans. Good governance is aligned to corporate mechanisms or business and administrative processes in commercial and private sectors. Effective governance achieves the desired outcomes of the intervention (van Leeuwen et al., 2014; Vousden, 2016; Chandrakumar and McLaren, 2018; Gattuso et al., 2018; Bennett et al., 2019; Fanning and Mahon, 2020), which often requires good governance structures and processes.

Effective regional ocean governance will advance the implementation of EBM. Effective polycentric regional ocean

**TABLE 1 |** BCC party state representation at formal structures of the BCC commission.

| BCC structures                               | Country ministries*         |                                  |                                    |
|--|-----------------------------|----------------------------------|------------------------------------|
|  | Angola                      | Namibia                          | South Africa                       |
| Inter-Ministerial, Commission and Committees | Agriculture and fisheries** | Fisheries and marine resources** | Environmental affairs**            |
|  | Environment                 | Environment and tourism          | Agriculture forestry and fisheries |
|  | Transport                   | Works and transport              | Transport                          |
|  | Petroleum                   | Mines and energy                 | Mineral resources                  |

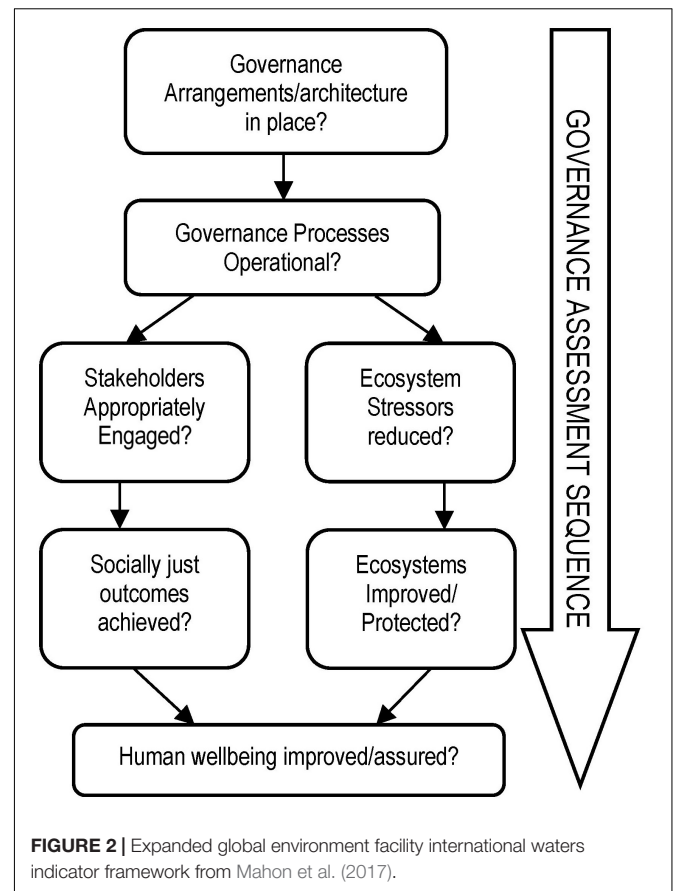
\*These are the names of the signing ministries where commissioners are based. Some ministry names have changed since the signing of the strategic action plan. \*\*Lead ministry that nominates BCC commissioner.

governance will be evidenced by multiple centers of authority successfully working through levels of integration toward achieving a common cause. The common cause selected for this review of the BCC governance modality is the implementation of EBM. Implementation of EBM is assessed in terms of formulation of objectives, resultant actions and project outcomes from the Convention's first SAP.

Ecosystem-based management is articulated in Principle 6 of the BCC (art. 4) which specifically includes "Conservation of the Marine Ecosystem." The Convention includes in its definitions (art. 1) an expansive definition of the terms Ecosystem and Environment. Ecosystem being defined as: "a dynamic system of plant, animal and micro-organisms communities and their non-living environment interacting as a functional unit." The Environment is defined as: "includes, but is not limited to, the whole or any component of (a) nature, which includes air, water (including the sea, and the seabed), land (including soils and minerals), energy and living organisms other than humans; (b) the interaction between the components of nature and between those components and humans; and (c) physical, aesthetic, and cultural qualities or conditions that affect the health and well-being of humans." When reading both the definitions together human dimensions are intrinsically included in the ecosystem conceptualization. For this study a fuller definition of EBM is considered which includes both a transboundary management component and the human dimensions of ecosystems (Alexander et al., 2018; Belgrano and Villasante, 2021). The TWAP (Fanning et al., 2015; Mahon et al., 2015) observed that the BCC had a structured governance arrangement with an established Commission. It further assessed that the structured governance can be associated with a low level of risk to transboundary arrangements and a high level of integration with regards to the six regional agreements considered in the review. Observations in the TWAP focused on the extent to which governance arrangements are established and if state parties participated in working across the identified major agreements in the region. From a business architecture or administrative process perspective, the BCC and its Commission appear to be meeting higher standards of operation and are profiled as having less risk exposure to administrative governance failure. The previous TWAP review is here taken to a higher resolution to include the working arrangements within the Commission and its established structures.

Following from the TWAP, Mahon et al. (2017) proposed an enhanced Transboundary Assessment Framework, where effective management interventions are measured ultimately by positive improvement and outcomes for human well-being. This proposed assessment for projects of the International Waters Program sets the following categories of indicators to be measured: Arrangements/Architecture in place; Governance processes operational; Ecosystem stressors reduced; Ecosystems improved/protected; Stakeholders appropriately engaged; Socially just outcomes achieved; and Human well-being improved/assured. This expanded assessment framework is illustrated in Figure 2.

In this proposed framework, four new categories were added around the second, third, and fourth previously established



categories for assessments of the International Waters Program (Duda, 2002). The proposed framework better balances the good governance and effective governance aspects and places the human well-being category as the outcome of both social justice outcomes and improved or protected ecosystems.

The inclusion of human-wellbeing as the desired impact of ocean governance reflects the fuller definition of the EBM, which includes the human dimension. The enhanced framework recognizes the emerging concepts of sociological ecosystems and integrated ecological assessments and indicators (Link and Browman, 2017; Link et al., 2017; Dunford et al., 2018; Spooner et al., 2021; Williams et al., 2021).

The BCC's overall objective is to deliver on the human well-being indicator of sustainable use through EBM of the Benguela Current Large Marine Ecosystem. In investigating governance effectiveness of the BCC this study follows the enhanced framework by assessing governance structure as well as EBM implementation. The extent to which this is achieved is measured by evaluating the transboundary or ecosystem-wide strategies and interventions that have been identified in the SAP or decided on and implemented by the Commission. This assessment of achieving the common cause of EBM is undertaken as a measure of effectiveness and impact of the BCC. EBM with the objective of managing, maintaining and enhancing the availability of ecosystem services has over the last decade been established as the operational standard for transboundary and

large marine ecosystem governance (Raakjaer et al., 2014; Smith et al., 2017; Gonzales et al., 2019; Le Heron et al., 2020; O'Higgins et al., 2020). Taking into consideration the recently proposed International Waters Assessment Framework indicators, effective EBM implementation by the BCC and other transboundary ocean regimes must include the human dimensions. These dimensions include impact caused and opportunity for the promotion of well-being.

In their review of regional ocean governance mechanisms Mahon and Fanning (2019a) classify the BCC as a Centralized Authority form of polycentric governance arrangement. The Centralized Authority category or mode is at the furthest end away from Functional Polycentricity in the proposed Governance Modality Spectrum. The authors discuss that such a Centralized Authority is an expected reaction to the complex and diverse management issues and mechanisms that potentially exist in transboundary large marine ecosystems. They also argue that functional polycentricity may offer a better balance of strategic objectives or common cause and management resolution. Polycentricity will facilitate codesign of actions and focus where several management arrangements must work in concert to deliver impact. In their discussion of the advantages of such a sector-focused implementation, the nested approach previously described in transboundary ocean governance is considered (Gruby and Basurto, 2013; van Leeuwen et al., 2014; van Tatenhove, 2017).

Polycentricity offers the multi-dimensional approach required in transboundary large marine ecosystem management.

The two review papers by Mahon and Fanning on regional ocean governance arrangements concluded with a clear call for more theoretical and case study examinations of regional ocean governance approaches and institutional mechanisms. The BCC and its implementing structure and mechanisms are investigated for polycentricity through the Governance Modality Spectrum.

This paper responds to the call for higher resolution case studies of indigenous or regional ocean governance institutions. It examines the theoretical concept of polycentricity with regards to the BCC and investigates the classification as a Centralized Authority. The concepts of polycentricity, governance efficacy and effectiveness through the implementation of the EBM by the BCC Commission are explored. The paper concludes that while BCC is a Centralized Authority as an institutional governance structure its operational functioning within this architecture is polycentric. The BCC allows for interaction and objective setting across sector departments while state parties operate independently. This polycentric nature places the BCC as a supportive governance framework for implementing transboundary EBM.

## MATERIALS AND METHODS

### Polycentricity

The Working Groups, their country representativeness, and terms of reference were requested from the Secretariat of the Commission and current chair or coordinator of the EAC and the Compliance Committee. Not all the Working Groups had

fully developed terms of reference at time of query in the first quarter of 2021. In assessing the extent of polycentricity the representativeness in the operational structures by the national departments mandated to regulate the various ocean sectors in three party states was determined. In a second assessment of polycentricity the themes of the various working groups were investigated to determine the scope covered. The inclusion of diverse ocean sector ministries and departments, overlapping participation in global and regional agreements and the scope of the specialist Working Groups set up by the Commission are indicators of polycentricity. Each government department represents a center of authority. These centers are offered a common governance objective through EBM of the Benguela Current Large Marine Ecosystem, through the BCC.

### Ecosystem-Based Management Implementation

The primary document assessed was the SAP of the BCC with an intended implementation period from 2015 to 2019 (BCC Secretariat, 2014). The SAP was assessed to identify which of the proposed Action Responses relate to EBM. Action Responses contributing to EBM were identified in two ways. The criteria used for EBM primarily relate to the inclusion of whole ecosystem or transboundary working arrangements and planned impact. This is the primary criteria selected as the BCC is a regional governance mechanism, and so the critical success indicator will be regional interventions as opposed to EBM that may be implemented successfully but only within one of the participating states. Secondly, EBM, has evolved to be as inclusive as possible of whole natural ecosystem functioning including human dimensions. As the human dimension is here interpreted as impacting all communities of the three party states, Action Responses referring to the inclusion of human dimensions are also regarded as contributing to EBM.

The Action Responses identified as contributing more directly to EBM were then assessed in terms of the extent to which they have been implemented. Recent projects of the BCC were interrogated to identify how these Action Responses were implemented. The extent to which the Action Responses were achieved over the 2015 to 2019 period were assessed through published project outcomes and reports archived on the BCC and project specific websites or in published literature.

These Action Responses are then scored to illustrate the extent of implementation. The scoring provides for a basic quantification of the subjective assessment of EBM implementation. Scores were awarded across a range from 0 to 2. Zero was awarded where no ecosystem-wide product or intervention of any form responding to the Action Response was observed, 1 awarded if there exists a science or technical report or working group established responding to the Action Response and 2 awarded if the Commission decided on a transboundary action or management intervention, including any guidelines to countries regarding the Action Response.

The Commission's project documents analyzed in this assessment included the MARISMA; the Enhancing Climate Change Resilience in the Benguela Current Fisheries System

Project; the Improving Ocean Governance in the Benguela Large Marine Ecosystem (BCLME III) Project; the Development of Ecological Sustainable Fisheries Practices in the Benguela Current Large Marine Ecosystem (ECOFISH) Project and the BCC – Norwegian Science Plan. The project documents for these projects were accessed from the BCC website (BCC Secretariat, 2021). Prior to 2008 three major projects were undertaken: The First and Second Benguela Current Large Marine Ecosystem Projects (BCLME I and II) and the Benguela Environment Fisheries Interaction and Training Programs. These were characterized largely as natural science research programs and provided and collated much of the foundational knowledge and motivation for the creation of the Convention. These programs are not included for detailed analysis of their outcomes in this study.

## RESULTS

### Polycentricity

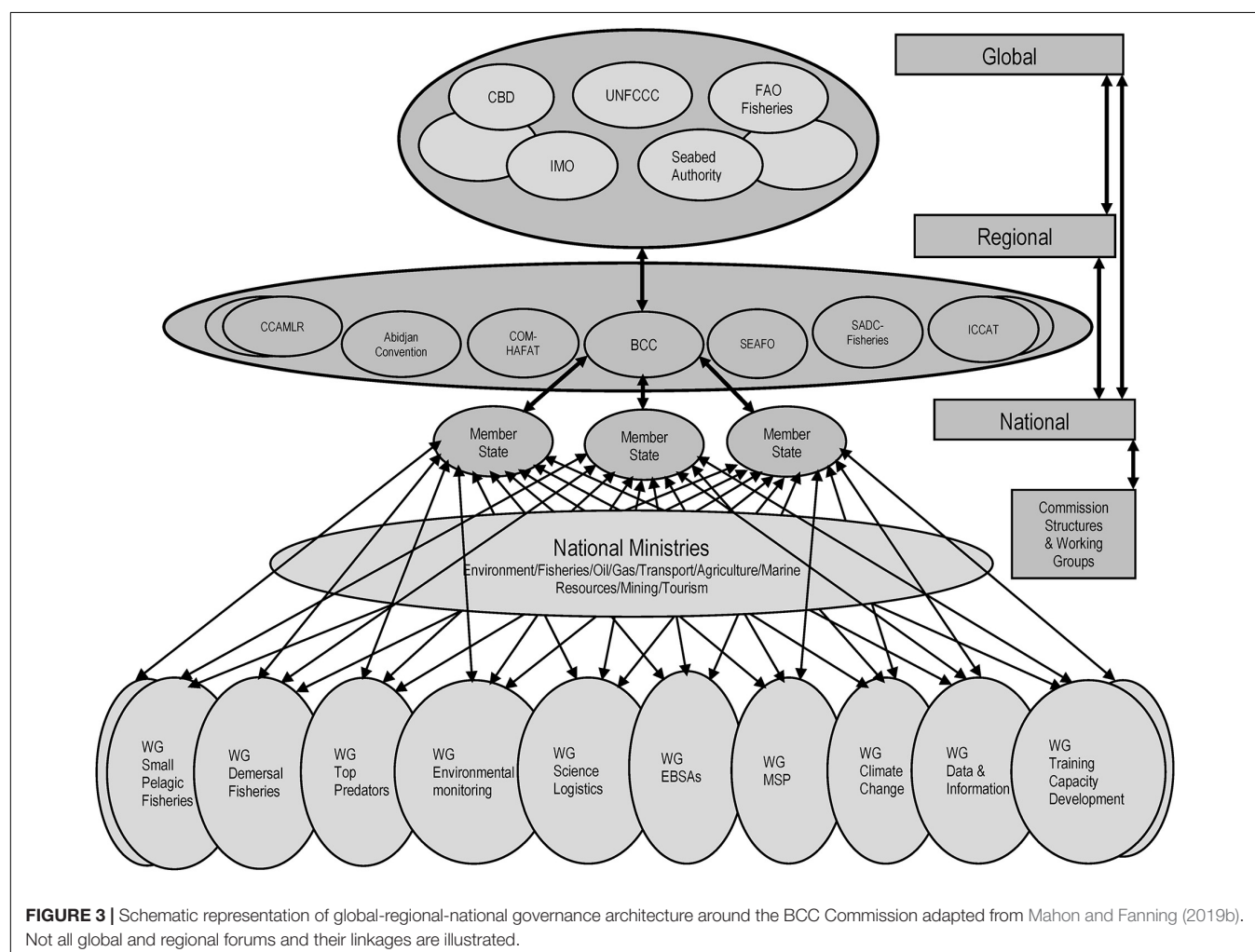
The BCC Strategic Action Plan reflects a total of 12 ministries as signatories. These ministries cover living and non-living

marine resources, tourism, agriculture, transport, works or infrastructure, and environmental management. Participating ministries are described in **Table 1**. Ministries from the three party states nominate members to serve in the various scientific and technical working groups as illustrated in **Figure 3**. The Working Groups are created, tasked by and report to the Committees such as the EAC and the Compliance Committees (**Figure 1**). The various ministries represent centers of regulatory authority in each of the party states. The BCC Commission, its Committees, and Working Groups offer a coordination mechanism for these various centers of authority. Cumulatively the Working Groups can provide advice on EBM at the scope of the large marine ecosystem.

### Ecosystem-Based Management Implementation

The SAP proposes several Strategic Solutions to the identified Challenges. The Solutions in the SAP are categorized into eight areas that identify Action Responses to the Challenges.

The Action Responses that directly referenced transboundary interventions or actions around shared resources numbered 31



**TABLE 2 |** Strategic solutions and associated action responses in the strategic action plan (SAP) of the Benguela Current Commission.

|   | Strategic solution                         | SAP action response  | EBM human dimension | EBM Trans-boundary | Assessment score (0–2) |
|---|--|--|---------------------|--------------------|------------------------|
| 1 | Living marine resources                    | 1. Ascertain which stocks are marine transboundary resources.  |                     | ✓                  | 1                      |
|   |  | 2. Manage shared stocks cooperatively by harmonizing research and management planning and implementation.  |                     | ✓                  | 0                      |
|   |  | 3. Implement ecosystem-based management.   |                     | ✓                  | 1                      |
|   |  | 4. Ensure compliance with management and conservation measures.  |                     |                    |                        |
| 2 | Non-living marine resources                | 5. Understand the ecosystem impacts of exploration and extraction activities.  |                     | ✓                  | 1                      |
|   |  | 6. Integrate and implement international standards for exploration and extraction.   |                     | ✓                  | 0                      |
|   |  | 7. Adoption and use of Integrated Ocean and Coastal Management   |                     | ✓                  | 0                      |
| 3 | Productivity and environmental variability | 8. Improve the understanding of the BCLME ecosystem.   |                     | ✓                  | 2                      |
|   |  | 9. Improve the understanding and predictability of climate change impacts and climate variability at seasonal inter-annual and longer time scales. | ✓                   |                    | 1                      |
|   |  | 10. Improve the understanding of harmful algal blooms and hypoxia.   |                     |                    |                        |
| 4 | Pollution                                  | 11. Monitor and manage coastal water quality around pollution “hotspots.”  | ✓                   |                    | 1                      |
|   |  | 12. Improve the understanding of river pollution in the BCLME.   |                     | ✓                  | 1                      |
|   |  | 13. Prevent, abate, mitigate and prepare for oil spills.   |                     |                    |                        |
|   |  | 14. Prevent, abate and mitigate against marine litter.   |                     |                    |                        |
|   |  | 15. Understand the impacts of noise pollution and mitigate as necessary.   |                     |                    |                        |
|   |  | 16. Reduce emissions of greenhouse gasses.   |                     |                    |                        |
| 5 | Ecosystem health and biodiversity          | 17. Reduce threats to species and habitats.  |                     | ✓                  | 1                      |
|   |  | 18. Strengthen ability to monitor ecosystem health.  |                     | ✓                  | 1                      |
| 6 | Human dimensions                           | 19. Ensure consistency of human dimension data across countries.   |                     | ✓                  | 0                      |
|   |  | 20. Expand the knowledge base in respect to human dimensions in the BCLME region.  |                     | ✓                  | 1                      |
|   |  | 21. Incorporate human dimensions into resource management decision-making.   | ✓                   |                    | 1                      |
|   |  | 22. Implement regional cooperation for safety-at-sea.  |                     | ✓                  |                        |
|   |  | 23. Develop constructive participation by stakeholders and reduce conflicts.   | ✓                   |                    | 1                      |
|   |  | 24. Enhance the economic development potential.  | ✓                   |                    | 0                      |

(Continued)

TABLE 2 | Continued

|   | Strategic solution                         | SAP action response   | EBM human dimension | EBM Trans-boundary | Assessment score (0–2) |
|---|--|---|---------------------|--------------------|------------------------|
| 7 | Enhance the economic development potential | 25. Adoption and use of Integrated Ocean and Coastal Management.  |                     | ✓                  | 0                      |
|   |  | 26. Develop a supportive funding and revenue model for infrastructure and operations in marine transport.   |                     |                    |                        |
|   |  | 27. Develop adequate infrastructure such as port facilities, pipeline networks to enable successful offshore oil and gas exploration.   |                     |                    |                        |
|   |  | 28. Develop an integrated plan for skills development for offshore oil and gas sector.  |                     | ✓                  | 0                      |
|   |  | 29. Establish a funding mechanism to address challenges in financing aquaculture and improve market accessibility.  |                     |                    |                        |
|   |  | 30. Conduct research to better understand methods for extracting minerals in a responsible and sustainable manner.  |                     |                    |                        |
|   |  | 31. Manage competition for shared resources/space by employing adequate spatial planning.   |                     | ✓                  | 0                      |
| 8 | Governance                                 | 32. Enhance key economic sectors, e.g., marine transport and manufacturing; offshore oil and gas; fisheries; integrated ocean governance and protection to achieve sustainable ocean development through integrated ocean governance and marine spatial planning. |                     | ✓                  | 1                      |
|   |  | 33. Harmonize mitigation measures related to extraction activities to minimize environmental impacts and ensure that monitoring standards are of international quality.   |                     | ✓                  | 1                      |
|   |  | 34. Strengthen national human capacity to participate in BCC processes.   |                     | ✓                  | 1                      |
|   |  | 35. Strengthen national institutional capacity and mechanisms to implement the SAP and IP (Implementation Plan).  | ✓                   |                    | 1                      |
|   |  | 36. Strengthen and harmonize policy and legislative frameworks.   |                     | ✓                  | 1                      |
|   |  | 37. Strengthen information, communication and awareness mechanisms.   | ✓                   |                    | 1                      |
|   |  | 38. Strengthen the governance structures and procedures for the BCC.  | ✓                   |                    | 2                      |
|   |  | 39. Strengthen regional and international cooperation.  |                     | ✓                  | 0                      |
|   |  | 40. Establish sustainable financing mechanisms.   | ✓                   |                    | 1                      |
|   |  | 41. Review and monitor progress in implementing the SAP.  | ✓                   |                    | 2                      |

Action responses that directly relate to ecosystem-based management are highlighted with an assessment of achievement.

of 41 when both the human dimension and transboundary aspects are considered together. When only the transboundary consideration of EBM was used 21 of the 41 Action Responses are accounted for. All the Action Responses contained in the Ecosystem Health and Biodiversity, Human Dimensions and Governance themes are interpreted as contributing to EBM. It can therefore be contemplated that the Action Responses are largely responding to EBM. The wording of these responses is not always framed at interventions and outcomes at the transboundary or ecosystem-wide scale. For instance, oil spill response is not directly related to standard

operation procedures for the three countries, nor approaches to land-based sources of pollution or standardization of methods and thresholds to monitor ecosystem health. Oil spill response does have a BCC Working Group set up within the Compliance Committee but is not identified as an EBM response in **Table 2**. The transboundary or human dimension, although implied in all the pollution Action Responses, is not reflected in the phrasing of the Oil Spill Action Response.

The scoring of achievement around the Action Responses was challenging because the SAP did not have an implementation or

business plan attached to it. The Commission operates through its Secretariat comprising a few staff based in Swakopmund, Namibia. Taking direction from the SAP, the Secretariat coordinates efforts of the members to draft and submit proposals to various international funding agencies and donor countries. The projects implemented by the Commission during the 2015–2019 Strategic Action Plan did not directly reference the Strategic Solutions or Action Response items in their proposed work plans. The projects did produce several reports and science outcomes that can be related to the eight Strategic Solutions categories.

These project outcomes did not yet translate into transboundary decisions at the BCC Commission or Inter-Ministerial Meeting levels. The only Action Responses that received a score of 2, denoting a decision at the Commission level, were those of Improving the understanding of the BCLME; Strengthen governance structure and procedures of the BCC; and Review and monitor progress in implementing the SAP. The first of these Action Responses confirms a focus on generation of knowledge of the BCLME through science programs and the creation of specialist working groups. These science products build on the transboundary science programs that preceded the formal drafting of the Convention. The other responses scoring 2 denote the BCC Commission establishment and improvement of its start-up structure through the setting up of EAC and similar committees, and the review undertaken of the implementation of the first SAP.

There are existing or planned science products within recently-implemented and ongoing projects that can be foundational to regional EBM interventions. These knowledge outcomes of the projects are described briefly below.

## The Marine Spatial Management and Governance Program

The MARISMA project is funded by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, with in-kind co-funding contributions by the BCC party states. The project is implemented by the German Development Cooperation (GIZ). Like other major projects of the BCC, the MARISMA project office is based in Swakopmund, Namibia.

The MARISMA Project has two broad areas of output namely MSP implementation or institutionalization and the identification and description of EBSA (Mausolf, 2014). The project aims to produce marine spatial plans at the National and Regional level and to update atlases of EBSAs in the BCLME. The MSP and EBSA outcomes align directly with the EBM approach. Individual and aggregated pressures on the ecosystem will have to be identified with suitable management interventions developed and recommended during the MSP processes. The EBSA identification process will guide countries and the Commission in management interventions selected for these areas. The Project's approach has been to set up national and regional working groups for MSP and EBSAs. The Project produced a Regional MSP Strategy that has been adopted by the Commission. This can be viewed as regional endorsement of MSP as a governance approach. The three party states are at

different phases of MSP policy development and implementation (Finke et al., 2020).

## Enhancing Climate Change Resilience in the Benguela Current Fisheries System

This project is presented as delivering climate change adaptation strategies to marine fisheries and aquaculture sectors. The project objective is to build resilience and reduce vulnerability to climate change and to ensure food and livelihood security. The Project is funded by the Global Environment Facility (GEF) with in-kind contributions from the Convention party states (International Waters Learning Exchange and Resource Network, 2014).

This climate change adaptation project contributes to EBM in that it seeks to identify ecosystem shifts, change and variability and then seeks to create human resilience through adaptation. The project does highlight that environmental responses to climate change will include ecosystem-wide changes. These will impact the availability of ecosystem goods and services to coastal communities such as the availability of fish stocks. The project seeks to have impactful interventions at pilot sites. It therefore does not suggest a single overarching common transboundary outcome, as within country interventions at the pilot sites will be site specific. The governance outcome of encouraging and facilitating the incorporation of mitigation measures in policies of the three party states, could, however, be broadly considered an ecosystem-wide policy level intervention. Specific policy interventions at the national level may or may not be similar across the three states, as states may opt for implementing different response strategies.

The Project, although still being implemented, does list some key outcomes such as the Community-Level Socio-ecological Vulnerability Assessments in the Benguela Current Large Marine Ecosystem; Training Manual and Guidelines for Conducting Community-level Rapid Vulnerability Assessments and the Community-level Rapid Vulnerability Assessment to inform adaptation planning in Henties Bay, Namibia (Raemaekers and Sowman, 2015; Price et al., 2017; Sowman et al., 2017). Outcomes also included vulnerability and adaptability of large-scale fisheries (Cochrane et al., 2020).

## Improving Ocean Governance in the Benguela Large Marine Ecosystem Project

The BCLME III Project builds on the BCLME I and II Projects, which supported the creation of the Convention (Global Environment Facility, 2014). These earlier projects were also funded by the GEF and implemented in cooperation with the United Nations Development Program.

The Objective of this third funding phase is to further promote in actionable ways the cooperative and shared governance of the BCLME. It aims to achieve this by mainstreaming transboundary benefits and concepts into the national policies of the three party states. The Outcomes of this Project are described in Four Components: Improved Ocean and Coastal Governance; Stakeholder Engagement and Partnership Collaborations; Capacity Development and Training; and

Marketing, Resource Mobilization and Fiscal Sustainability. The project generally aims to improve both the governance impact and efficiencies and sustainability of the Convention.

The Project fully recognizes the transboundary requirement for implementing EBM, and that EBM must incorporate an integrated perception of the economic, environmental and social benefits. Implementation of the project is ongoing and no final output reports could be identified yet.

Significantly, planned outcomes of the project include reviewing the SAP and improving regional governance and cooperation. A draft SAP high-lighting priority areas of focus has been distributed to party states for comment in early 2021. This includes a review of the functioning of the BCC structures toward improving governance. Criteria for the success of this project must be the measurement of articulated and implemented transboundary policy interventions. The project outcomes appear to be a recognition that the Commission needs to function more impactfully at the ecosystem-wide scale, including human dimensions.

## Development of Ecologically Sustainable Fisheries Practices in the Benguela Current Large Marine Ecosystem

The ECOFISH Project was funded by the European Union and was implemented from 2010 to 2016. It focused on reviewing and enhancing fisheries and fishery stock assessment science. The Project has completed a number of reports, and has produced post-graduate degrees in addition to other short training interventions such as seminars and workshops (Hamukuaya, 2018). The project reviewed stock assessment techniques across the three countries, developed inter-calibration models across party states, and established evidence for distinct and shared transboundary stocks.

The Project, although focused on fisheries, illustrated the transboundary nature of the Benguela Ecosystem through system processes and shared fish stocks. Its work and knowledge products strongly motivated that the BCLME be managed as a shared ecosystem. In the process of undertaking its work program, the Project supported the establishment and work of the BCC Demersal and Small Pelagic Fisheries Science Working Groups. These Working Groups continue to provide a forum to facilitate ecosystem-wide discussions and collaborations, securing the sustainability of the methods and scientific processes developed and implemented during the project. While the project has identified shared fish stocks in the region, there has been no decision on shared management models for any species or group of species at the Commission level that could be determined from currently reported work.

## Benguela Current Convention – Norwegian Science Plan (2016–2017)

The BCC website acknowledges Norwegian support for various ocean science programs over the recent decades. These initially focused on fish stock surveys of the major offshore fish stocks in the region. These surveys were undertaken with the research ship the *Dr. Fridtjof Nansen*, through a FAO program and produced

several reports on fish stock status (Norwegian Ministry of Foreign Affairs, 2017).

More recently and in apparent response to the SAP Response Actions, work programs and outcomes of this project appeared to be more EBM focused. The BCC-Norwegian collaboration implemented an EBM science and capacity building program. This program produced several ecosystem related reports including: Reduced Threats to Species and Habitats; Strengthening Ability to Monitor Ecosystem Health; Strengthening the Fisheries Management in the BCLME through the Application of Ecosystem Risk Assessment; and Identifying, Monitoring and Managing Pollution at Hotspot Locations (Hamukuaya, 2017). The program also funded the drafting of water quality guidelines, including environmental monitoring and indicator considerations. Prior to the focused EBM support program, similar Norwegian-FAO partnership programs delivered reports and recommendations on the inclusion of human dimensions in fisheries management, including consideration of small-scale fishers in the region (Paterson et al., 2012).

The BCC ecosystem assessment objectives continue to be reflected within the 2019 Ecosystem Approach to Fisheries (EAF) Nansen Program (Food and Agricultural Organisation of the United Nations, 2021). In addition to fish stock surveys, the program also includes several fisheries science and management training programs and interventions. This program appears to build capacity toward EBM both in the collection of environmental observations and management training interventions.

## DISCUSSION

### Polycentricity at the Benguela Current Convention

The Commissioners of the three countries represent various configurations of ocean related ministries. At present, with the Fisheries Management portfolio returning to the Environmental Affairs portfolio in South Africa, all the lead Departments that nominate Commissioners have Fisheries Management as one of their primary mandates. The Convention incorporates all aspects of the ecosystem functioning and marine resource categories. The Commission therefore includes several ministries: environmental affairs, biodiversity conservation, agriculture, mining, oil, gas, marine resources, tourism, and transport. There are several overlapping mandate or governance areas represented in the Commission structure of the Convention. The three party states are also signatory to a host of regional and international agreements within each of the various ocean sectors.

Polycentricity is represented at the BCC Commission through the various ocean sector government departments or agencies that participate in the organizational structures. These represented sectors include the environment and conservation sectors, as well as various industry sectors. Polycentric representation occurs through the government departments bringing in their national mandates and regulatory authority over their various sectors. An additional layer of

polycentricity is achieved through the party states bringing to the Commission their international commitments and agreed policy objectives at the various international forums.

While showing an initial bias toward fisheries, the scope of the BCC Working Groups is now demonstrating a wider ecosystem approach. These Working Groups cover a range of aspects from fisheries assessments, environment (pollution and biodiversity) monitoring and assessment, MSP, climate change, data management, and human capacity development. Industrial sectors other than fisheries such as mining and transport do not have dedicated Working Groups, but this does not exclude discussion on these aspects from occurring as cross-cutting issues in Working Groups such as those dealing with environmental monitoring, MSP and fisheries compliance.

## The Benguela Current Convention and Implementing the Ecosystem-Based Approach to Marine Management

Implementing EBM is complex. This complexity is demonstrated in an increasing trend across management agencies toward addressing polycentricity through the incorporation of several dimensions and interactions across the environment, society and economy (Arkema et al., 2006; Karsenti et al., 2011; Link and Browman, 2014, 2017).

Effective ocean management must be undertaken at the functional ecosystem level. This is because perceiving drivers and formulating responses at a scale lower than this will be incomplete and ineffective. Management interventions that are determined at a scale lower than the ecosystem level may be spurious and have unintended consequences. This will apply for example to adult and pre-adult distributions of fish and other marine life such as migratory seabirds, whales, seals and turtles. To implement EBM in the ocean space, the basic, regional-scale ecosystem unit has been widely accepted as the large marine ecosystem (Sherman, 2014a,b; Sherman and Hamukuaya, 2016; Duda, 2019).

Governance and legal frameworks, along with basic knowledge generation of the ecosystem and communication across various stakeholders are identified as primary challenges to implementing EBM at regional or large marine ecosystem scales (Marshak et al., 2017). The BCC responds to these challenges with varying levels of success. The Commission itself, as a regional body that meets regularly, represents a governance framework that can develop cooperation around the understanding and management of the Benguela Current Large Marine Ecosystem. The improved understanding of the Benguela Current Large Marine Ecosystem is evidenced by the several science reports produced and technical BCC Working Groups created. From the early transboundary initiatives that were focused on fish stock assessments, more recent reports, produced by the major projects, have included ecosystem considerations including human dimension aspects. The primary challenges of governance and legal frameworks in implementing EBM at the regional scale are then potentially addressed by the BCC and the Commission with its associated working structures.

The 2015–2019 BCC Strategic Action Program poses Challenges and Action Responses leveled at optimizing the sustainable use of the Benguela Current Large Marine Ecosystem. Not all the Action Responses are, however, specifically framed as transboundary actions. A realistic option is a combination of transboundary and national or local Action Responses so that objectives and outcomes are strategically aligned. Local implementation will have the flexibility to respond to local conditions while enjoying the benefits of shared experiences and learnings.

The human dimensions will have to be material and grown in the formulation of impact targets and indicators. To operate at the large marine ecosystem scale and optimize investment, efficiencies and impact, the Commission can consider framing its Action Responses in more direct transboundary terms in subsequent SAPs. This will have the added advantage of focusing proposal drafting and funding applications at ecosystem-wide outcomes.

The BCC and its Commission, therefore, does contribute positively to EBM by providing both an ecosystem-level governance institution and by developing a growing knowledge base on the functioning of the large marine ecosystem. The Commission provides a three-country forum for ecosystem-level discussions, knowledge assimilation and framing of interventions. This forum begins the response to the challenges of regional governance and legal frameworks, ecosystem-scale knowledge platforms and improved communications as outlined in reviews of EBM operationalization (Jay et al., 2016; Buhl-Mortensen et al., 2017; Marshak et al., 2017; Österblom et al., 2017). These reviews do, however, also highlight the challenge of implementing governance and management measures. While interventions may be framed through intercountry processes, implementation of these must occur at the country level. Individual countries in any Large Marine Ecosystem, including the Benguela Current, have their individual set of processes, for national policy formulation, stakeholder engagement and implementation – all of which are driven by national priorities.

The assessment of the implementation of Action Responses shows that the Commission has yet to move beyond science reports to making decisions on EBM implementation at the large marine ecosystem level. Several of the projects implemented by the Commission over the last decade have had a focus on ecosystem functioning and management, specifically the recent joint BCC-Norwegian Science Program, that focused (in part) on ecosystem health and the MARISMA project focusing on MSP and the identification of EBSA. The creation of the Regional MSP Working Group will provide a forum and opportunity for alignment and coherence across national marine spatial plans. Possible interventions based on existing science products, could have been shared management for fish stocks where science project outcomes have indicated transboundary stocks (Hamukuaya et al., 2016). The BCC can also actively seek to facilitate through transboundary projects the implementation of the ecosystems approaches to fisheries management, including mainstreaming biodiversity considerations as promoted by the CBD and FAO (Friedman et al., 2018). Such approaches will also support the maintenance and application of export

standards like the Marine Stewardship Council (MSC), which currently certifies fisheries in the region for export to the northern hemisphere markets. The hake fisheries of Namibia and South Africa are certified by the MSC. The Namibian final draft assessment report notes for instance the need for cooperation on joint assessment and management approaches to the shared hake fisheries between South Africa and Namibia (Namibian Msc Final Draft Report on Hake Demersal and Longline Fishery, 2020). Uniform approaches toward mitigating pollution including common approaches to or thresholds for chemical pollutants also present opportunities for ecosystem-wide interventions. There are existing global and regional agreements on the need for pollution mitigation (Valiullina et al., 2019). Some Pacific Island countries have initiated collaboration on Regional Seabed Mining Guidelines (Miller et al., 2018). The BCC could follow in developing such regional guidelines.

The Commission, through the science programs it supported, has produced extensive basic descriptions of ecosystem functioning, and early descriptions of social and economic dimensions (Sumaila, 2016) of the BCLME. An evolution of this science information will be to implement the use of indicators for various aspects of ecosystem health of the BCLME. Included in the use of indicators must be thresholds or limits, upon which the party states must act. This could be similar to European Union Directive on measuring good environmental status of marine waters (European Commission, 2017). The formulation of indicators and thresholds is increasingly being motivated in ecosystems management. The identification of indicators and thresholds allows for discussions on tipping points in the functioning of the system. Tipping points in the functioning of systems signal significant changes in the system's ability to maintain and provide its ecosystem services (Tallis et al., 2012; Österblom et al., 2017; Lombard et al., 2019). The development of indicators, thresholds and tipping points will facilitate discussions on areas of linkages and feedback mechanisms across the local, national and regional scales.

## CONCLUSION

Like any regional multilateral institution, the BCC Commission, is constrained in the extent to which it can impact policy formulation and implementation at the national level. There is an argument that the regional seas governance frameworks must be able to move out of their constraint of being subject to national policy if they are to be more effective (van Tatenhove, 2013; Raakjaer et al., 2014; van Leeuwen et al., 2014). van Tatenhove (2017), for instance, suggests that Transboundary Marine Spatial Planning must be developed as a “reflexive governance arrangement,” where transboundary policy formulation must challenge existing norms and directions of nationally focused MSP. If the Commission operated in a manner that developed and implemented such transboundary intervention across the three party states (across the mandated centers of authority in each national ministry) it would more closely meet the

description of the Centralized Authority as described in Mahon and Fanning (2019a) Governance Modality Spectrum.

The Commission allows the party states and their respective national ministries and departments to continue their implementation independently while providing a forum for polycentric discussions across the various ocean sector governance agencies. States and ministries define their policies and implementation mechanisms.

This then places the Commission to the right of Centralized Authority in the Governance Modality Spectrum where Centralized Authority is on the extreme left and Functional Polycentric on the extreme right. The Commission does not function as an authority in regional ocean governance. It does not facilitate binding policy and implementation mechanisms at the sector or national level. At the resolution of its operations the BCC can be categorized at one of the intermediate modalities of Polycentric Fragmented or Polycentric Bricolage. The requirements for consideration of being placed further into the right half of the modality spectrum such as harmonizing of architecture and principles or codesign of interventions and outcomes across the various ocean management sectors is not evident.

**Figure 3** illustrates a global-regional-national governance architecture and is adapted from the Mahon and Fanning (2019b). It illustrates some of the global and regional forums that are at play within the BCLME as well as the interactions between the various national ministries and the established BCC Working Groups. The individual party states, Angola, Namibia, and South Africa interact at the level of the Commission and operationally through sending representatives to the various permanent structures and the technical working groups. The Commission and its permanent structures like the EAC and the Compliance Committee can draw on attendees from all the representative government ministries or departments. This presents the polycentric governance forum where coherence can be sought across policy objectives and management actions. The BCC Working Groups offer another technical level of polycentric governance opportunity. Working group representatives from the various state departments can develop and undertake inter-sector science programs or develop EBM implementation actions.

The BCC party states can also engage with other regional and global forums where they retain their status as sovereign states. This engagement can be reinforced through representation at these forums as a BCC group. Advancing polycentric governance further toward the right of the Governance Modality Spectrum will occur when actions both through individual party states and through the BCC at the regional and international forums promote coordinated and coherent governance initiatives. Both vertical and horizontal linkages and working arrangements are required for functional polycentric governance to occur.

Even beyond the transboundary governance arguments and assessments, some authors are motivating that management considerations for the ocean must include planetary or earth system scales. This is because social and more especially the economic trends that drive local behavior operate at the global scale in the modern world (Galaz et al., 2012;

Österblom et al., 2017). Österblom et al. (2017) describes these global issues as distal interactions and includes such concepts as advancing technological solutions across marine industries, safety and security, global politics, international trends in trade and commerce, and climate change. These factors do influence how marine ecosystems are used and managed locally. Their influence is not as easily discernible as the more local or proximal interactions such as fishing or habitat loss. However, drivers of proximal impacts such as fishing, and habitat loss may have their origin in the more distal or removed influences.

Beyond its provision of providing a regional governance and legal framework for EBM, the BCC Commission can play a role in linking and perceiving the interactions between proximal and distal influences on marine ecosystems. This can be achieved through fulfilling a vertical and horizontal linking role across global environmental and ocean sector forums such as the CBD, UNFCCC, ISA, IMO, and the FAO Fisheries programs to itself, as a regional governance organization, and then to the three national states party to the Convention. Similarly, horizontal linkages can be made across the regional agreements, such as fisheries management organizations, to identify dynamics in fish demand and industry dynamics.

The BCC, through the structuring of its Commission and associated groups created basic requirements for polycentric ocean governance discussions across the party states and their various national ocean management agencies. The Convention can achieve high levels of functional polycentric governance through defining cross-sector and codesigned transboundary governance programs and interventions.

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## DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

## AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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# Polycentricity and Regional Ocean Governance: Implications for the Emerging UN Agreement on Marine Biodiversity Beyond National Jurisdiction

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The governance of the two-thirds of the world's ocean in areas beyond national jurisdiction (the high seas and deep seabed beyond national jurisdiction or ABNJ) is currently fragmented into diverse institutions addressing specific activities, issues or regions. This has hampered the international community's ability to redress critical issues including biodiversity loss, pollution, climate change, ecosystem degradation and declining fisheries in an integrated and ecosystem-based manner. Our analysis of polycentricity theory and associated enabling conditions shows that the current polycentric approach to marine biodiversity in ABNJ is not yet fully functional: it is missing the two key attributes of: (1) generally applicable rules and norms structuring actions and behaviors, and (2) processes to enhance cooperation, coordination, and conflict resolution. Based on the enabling conditions conducive for achieving "a functional polycentric governance system" identified in Carlisle and Gruby (2019), combined with a prior analysis applying resilience principles for socio-ecological systems to ABNJ (Yadav and Gjerde, 2020), this article suggests seven ways the emerging United Nations agreement on the conservation and sustainable use of marine biodiversity of ABNJ (BBNJ Agreement) could stimulate coordinated and integrated action at both global and regional levels in ABNJ. These include: (1) overarching rules, goals and objectives; (2) formal and informal conflict resolution mechanisms; (3) robust global institutional arrangements; (4) strengthened global, regional and sectoral bodies with shared and overlapping responsibility for biodiversity conservation; (5) strengthened cooperation through integrated ecosystem assessments and strategic action programmes at ecologically meaningful scales that could include areas within and beyond national jurisdiction; (6) learning exchange mechanisms within and across regions; and (7) strengthened regional and national capacities for ecosystem-based management in ABNJ. Taken together, these tools could enhance the resilience of ocean institutions, ecosystems and biodiversity to cope with growing pressures, uncertainty and rapid change in ABNJ.

**Keywords:** polycentricity, resilience, regional ocean governance, large marine ecosystems (LMEs), areas beyond national jurisdiction (ABNJ), biodiversity beyond national jurisdiction (BBNJ), United Nations Convention on the Law of the Sea (UNCLOS)

## INTRODUCTION

The recognition of the crucial role of international ocean governance in building global ocean resilience is growing (UNEP, 2016; Wright et al., 2017; Gjerde and Wright, 2019; Mahon and Fanning, 2019b). The health and resilience of the global ocean in areas beyond national jurisdiction (the high seas and deep seabed beyond national boundaries or ABNJ) is threatened by climate change, overexploitation, pollution, and habitat degradation as well as their interacting and cumulative impacts (Ramirez-Llodra et al., 2011; Roberts et al., 2017; FAO, 2019; IPCC, 2019; Blasiak et al., 2020; World Ocean Assessment II, 2021). As noted by the United Nations Secretary-General in his foreword to the World Ocean Assessment II “to ensure sustainability, we must work together to improve integrated ocean management, including through joint research, capacity development and sharing of data, information and technology” (World Ocean Assessment II, 2021, p. 5).

To address these accelerating threats through more coherent and integrated management in ABNJ, the United Nations (UN) is currently in the final stages of negotiating a new Agreement for the conservation and sustainable use of marine biodiversity in ABNJ (BBNJ Agreement) under the UN Convention on the Law of the Sea (UNCLOS). In this context, the regional level [currently undefined but based largely on the geographic scope of regional seas agreements and/or regional fisheries bodies (see Section “Regional Ocean Governance: Institutional Arrangements, Benefits and Challenges”)], is being considered as an important vehicle for implementing the emerging BBNJ Agreement because of its assumed ability to enable States and stakeholders to take action “closer, further and faster” (Rochette et al., 2015, p. 9; PROG, 2021).

However, as explored in this article, the current ocean governance framework for ABNJ is facing challenges including conflicts and power imbalances, lack of mechanisms for coordination, integration or conflict resolution, and mismatches in jurisdictional scope, which together are hampering cooperation for biodiversity conservation and ecosystem-based integrated management (Mahon et al., 2015; Blanchard et al., 2019; Gjerde et al., 2019; Yadav and Gjerde, 2020). For the current clusters of regional and sectoral ocean governance agreements and institutions managing activities or issues affecting BBNJ to achieve their potential for advancing the BBNJ Agreement’s objectives, it is worth considering the enabling conditions for a functional polycentric governance system proposed by Carlisle and Gruby (2019) based on the work of Vincent and Elinor Ostrom (see Section “Polycentricity: Enabling Conditions, Benefits and Challenges” below).

The consideration of the regional level as a complement to global approaches in addressing the threats to the ocean is not new; several instruments encourage regional approaches including UNCLOS, the United Nations Fish Stocks Agreement (UNFSA) and the Convention on Biological Diversity (CBD) (UNEP, 2016; Harrison, 2017; Wright et al., 2017; Mahon and Fanning, 2019b). However, the current sectoral framework, which allocates responsibility to specific multilateral

organizations to manage different maritime activities in ABNJ such as fishing (regional), shipping (global) or mining (global), currently lacks effective coordination or integration mechanisms for advancing conservation and sustainable use of marine biodiversity (Fanning et al., 2015; UNEP, 2016; Wright et al., 2018; Blanchard et al., 2019; Mahon and Fanning, 2019b). Areas and species considered as priorities for protection by global conservation agreements such as the Convention on Biological Diversity (CBD), Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Convention on the Conservation of Migratory Species of Wild Animals (CMS) are generally poorly reflected in sectoral outcomes (Gjerde et al., 2019). Most regional seas and other non-sectoral organizations focus on waters within national jurisdiction [out to the limits of the territorial sea or Exclusive Economic Zones (EEZs)], with few opportunities to influence activities outside their limited geographical remit (see Section “Regional Ocean Governance: Institutional Arrangements, Benefits and Challenges” below).

In this regard, “polycentricity,” a concept advanced by Vincent and Elinor Ostrom since the 1960s, is relevant to understanding the interplay between regional, sectoral and global conservation institutions in ABNJ. Polycentricity itself is defined as any governance system with multiple, interacting decision-making centers with some degree of autonomy (Ostrom et al., 1961; Schoon et al., 2015; Carlisle and Gruby, 2019). However, to derive the benefits associated with a “functional polycentric governance system,” polycentric units should operate under shared rules, mechanisms for effective collaboration, cooperation and conflict resolution as well as other enabling conditions (Carlisle and Gruby, 2019, p. 929). This is particularly important for managing global common resources or global threats such as climate change or biodiversity loss. Hence, polycentricity theory can be a useful lens for considering under what conditions regional and sectoral institutions might advance global conservation goals more effectively in ABNJ (Mahon et al., 2015; Mahon and Fanning, 2019b) including through the emerging BBNJ Agreement.

## Aim of the Article

This article applies insights drawn from polycentricity theory to explore how the emerging BBNJ Agreement might strengthen integrated management for biodiversity benefits across regional and global level institutions, based on current UN discussions regarding potential institutional arrangements. This article aims to deepen the analysis in Yadav and Gjerde (2020) which applied the seven principles for building resilience in socio-ecological systems by Biggs et al. (2015) to the BBNJ Agreement. These seven principles are: (1) Maintain Diversity and Redundancy, (2) Manage Connectivity, (3) Manage Slow Variables and Feedbacks, (4) Foster Complex Adaptive Systems Thinking, (5) Encourage Learning, (6) Broaden Participation, and (7) Promote Polycentric Governance. Although the focus is on cooperation and integration amongst global and regional bodies, to consider how polycentricity theory might be applied at a smaller ecologically meaningful scale to implement the BBNJ Agreement, the article examines one innovative yet

challenging approach to sub-regional ocean governance, the Large Marine Ecosystem (LME) programme, for further lessons on fostering integrated ecosystem-based management at a bio-regional scale. The article also seeks to highlight the need for further study of polycentricity in ABNJ, especially on the effects of the power dynamics within international ocean governance, as power asymmetries and differing priorities may hinder the achievement of global environmental goals (Morrison et al., 2019).

## State of Play: Institutional Arrangements in the Draft BBNJ Agreement

Before investigating the issues surrounding polycentric theory and governance in ABNJ, it is helpful to understand the state of play of the BBNJ Agreement negotiations regarding the relationship between the BBNJ Agreement and other institutions and agreements, noting that formal negotiations are presently postponed until the first half of 2022. Three alternative approaches to the BBNJ institutional arrangements have emerged in the negotiations so far: (1) a global approach that would create a new global body with decision-making mechanisms and implementation authority; (2) a regional approach allocating authority to the existing bodies for decision-making and implementation; and (3) a mixed approach that could include a blending of global decision-making, standard-setting and implementation authority with strengthened cross-sectoral regional-scale implementation mechanisms (Wright et al., 2018; Clark, 2020).

Those supporting a more global approach have called for a centralized implementing role of the global body that could, for example, directly adopt protective measures for marine protected areas (MPAs) and review and approve environmental impact assessments (EIAs). This could enable States Parties to the BBNJ Agreement to adopt ambitious measures amongst themselves while seeking collaboration with other States and bodies (Clark, 2020). Some fear that such a global approach might “undermine” existing bodies and agreements, and often prefer a regionally-centered approach where existing sectoral and regional bodies would retain the primary if not sole authority for decision-making, implementation and monitoring (Friedman et al., 2018; Wright et al., 2018). This type of regional approach raises fears in turn that it could result in leaving authority primarily within the hands of existing sectoral bodies. Still others, including the authors, posit that a blended approach is needed that could both allocate many centralized powers to a global COP while seeking to strengthen existing sectoral and regional bodies and enhance cross-sectoral coordination. This blending could, it is hoped, pave the way for more integrated ecosystem-based management at a range of ecologically meaningful scales (Durussel et al., 2018; Gjerde et al., 2018, 2019). Hence, polycentric theory is relevant to better understand the enabling conditions for any of these three approaches to function effectively.

At present, there appears to be broad support for establishing at least the following core global institutional arrangements: (1) a Conference of Parties (COP) to provide a platform for the

parties to take decisions, carry out coordination and integration efforts, and review progress; (2) a scientific and technical body to advise on scientific and technical matters; and (3) a Secretariat to provide support to the bodies (Gjerde et al., 2018; Clark, 2020; Nordquist and Long, 2021).

However, less discussion has been devoted to considering how existing regional and sectoral agreements and bodies such as Regional Seas Conventions and Action Plans (RSCAPs), regional fisheries management organizations (RFMOs), the International Maritime Organization (IMO) or the International Seabed Authority (ISA) may need to be strengthened and what other mechanisms for cooperation and conflict resolution may need to be instituted to achieve effective implementation.

Discussion on this topic has been constrained by the concerns of some States and sectors that any effort to strengthen or influence existing global, regional or sectoral bodies would automatically “undermine” such bodies. This argument stems from a specific reading of the UNGA Resolution launching negotiations that set forth: “the process and its result should not undermine existing relevant legal instruments and frameworks and relevant global, regional and sectoral bodies” [GA Res 72/249, UNGAOR, Doc A/RES/72/249 (24 December 2017)]. However, “not undermine” can also be read as it is used in the UNFSA, another implementing agreement to UNCLOS, as “not undermining the effectiveness of” such bodies (Friedman et al., 2018; Clark, 2020). UNFSA further provides a useful model as it obliges its States Parties to strengthen existing institutions to improve their effectiveness in establishing and implementing conservation and management measures (e.g., by applying key conservation principles, adopting precautionary decision-rules and reference points, improving transparency) (Gjerde et al., 2019). Nevertheless, the UNFSA has been only partly successful in enhancing RFMO performance due in part to lack of mechanisms for global accountability or for taking into account other actors and interests in ABNJ (Gjerde et al., 2013), two central conditions for functional polycentric governance systems.

## Organization

Section “Polycentricity and Regional Ocean Governance” introduces polycentricity theory including its enabling conditions, benefits and challenges; and current regional ocean governance arrangements relevant to ABNJ. Section “Materials and Methods” describes the Methods and primary source material. Section “Results,” presents the findings on the application of polycentricity concepts to regional clusters of ocean governance in ABNJ. It also throws light on challenges faced in achieving the benefits of a functional polycentric ocean governance system for ABNJ, and on LME approaches. The Discussion section, focuses on implications of the above for the BBNJ Agreement taking into account existing polycentricity theory including Carlisle and Gruby’s (2019) theoretical model, the Stockholm Resilience Centre’s resilience framework, as well as lessons offered by LME approaches. It highlights seven ways the emerging BBNJ Agreement could contribute toward achieving the benefits associated with functional polycentric governance to advance institutional resilience, biodiversity conservation and

ecologically sustainable use in ABNJ. Finally, it draws attention to issues that require further research.

## POLYCENTRICITY AND REGIONAL OCEAN GOVERNANCE

### Polycentricity: Enabling Conditions, Benefits and Challenges

The concept of polycentricity was used by Ostrom et al. (1961) to describe why and how a diverse array of agencies providing public services could in fact produce better results than a single monolithic arrangement. In the seminal work on *"Polycentric systems for coping with collective action and global environmental change"* Elinor Ostrom (2010) applied this polycentric lens to the challenges of instigating action to redress the global issue of climate change, finding that "polycentric approaches facilitate achieving benefits at multiple scales as well as experimentation and learning from experience with diverse policies" (Ostrom, 2010, p. 550). Ostrom et al. (1961, p. 831, emphasis added) explain "polycentric" and polycentric "system" as follows:

"Polycentric" connotes many centers of decision making that are formally independent of each other. . . **To the extent that they take each other into account in competitive relationships, enter into various contractual and cooperative undertakings or have recourse to central mechanisms to resolve conflicts,** the various political jurisdictions in a metropolitan area may function in a coherent manner with consistent and predictable patterns of interacting behavior. To the extent that this is so, **they may be said to function as a "system."**

It is important to note that E. Ostrom (2010) was not against binding global agreements and global scale action on collective problems such as climate change. Rather, E. Ostrom (2010) saw value in action at all levels, noting "that problems involving multiple levels (e.g., global, national, regional, and small scales) should involve contributions at each of these levels" (Ostrom, 2010, p. 552).

Key characteristics, features and attributes of polycentric governance have been explored in a range of fields and diverse literatures. Carlisle and Gruby (2019, p. 6), based on the conceptualization by Ostrom et al. (1961), propose the following two attributes of polycentric governance systems: (1) "multiple, overlapping decision-making centers with some degree of autonomy," and (2) "choosing to act in ways that take into account of others through processes of cooperation, competition, conflict, and conflict resolution." Focusing on governance in the context of climate change, Jordan et al. (2018) propose five characteristics that polycentric systems have: local action, mutual adjustment, experimentation, trust, and overarching rules. Mahon and Fanning (2019a) have used these propositions by Jordan et al. (2018) in analyzing the extent to which regional ocean governance arrangements meet the criteria for functional polycentricity.

The existing literature associates polycentric governance with multiple advantages (McGinnis, 1999, 2000, 2005; Marshall, 2009; Galaz et al., 2012; Cole, 2015; Schoon et al., 2015; Carlisle

and Gruby, 2019; Mahon and Fanning, 2019a; Morrison et al., 2019). By empowering multiple actors at multiple levels, it is said to create new opportunities for creative approaches to developing and applying solutions (Carlisle and Gruby, 2019) and build resilience by enhancing diversity, redundancy, connectivity, learning, and participation of stakeholders (Schoon et al., 2015; Yadav and Gjerde, 2020). Cole (2015) further explains that polycentric approaches: (1) improve policy outcomes by offering more opportunities for learning and experimentation, and (2) help build trust required for increased cooperation by enhancing communications and interactions among parties. Mahon and Fanning (2019a, p. 3) draw on Gruby and Basurto's (2013) work on protected area management in Palau, to note that a nested polycentric system can enable local resource users to apply local knowledge to the design of context-specific rules, while larger organizations, including governments, "can enhance local capacity to deal with non-contributors or local tyrants, share and invest in information, and coordinate cross-boundary problems" (Gruby and Basurto, 2013, p. 50).

In the context of resilience theory, polycentric systems may be more resilient and robust to external shocks as another institution can step in if one institution falls short: the system can adapt and recover faster due to its diversity and redundancy (Low et al., 2003; Galaz et al., 2012; Biggs et al., 2015; Schoon et al., 2015; Morrison, 2017; Blanchard et al., 2019; Yadav and Gjerde, 2020).

However, it is also important to recognize that these advantages are more likely when the key attributes and enabling conditions identified by Carlisle and Gruby (2019) are present. **Table 1** shows the attributes and enabling conditions identified by Carlisle and Gruby (2019) that at least in theory lead to a more functional polycentric governance system.

Moreover, scholars note that power dynamics may create pitfalls and challenges through political conflicts and tradeoffs among parties, inconsistent policies, power imbalance, and financial challenges (Ostrom, 2010; Galaz et al., 2012; Schoon et al., 2015; Morrison et al., 2019) and have called for further research into this issue. As has been explored elsewhere, such issues along with jurisdictional and accountability gaps are especially pertinent in ABNJ (Ortuño Crespo et al., 2019; Gjerde et al., 2021). Additionally, evidence that polycentric systems always perform well or better over time than other forms of governance is lacking, and more empirical research is required to explore the circumstances and contexts in which polycentric governance systems may perform well or be ineffective (Ostrom et al., 1961; Marshall, 2015; Schoon et al., 2015; Carlisle and Gruby, 2018, 2019; Mahon and Fanning, 2019a).

### Regional Ocean Governance: Institutional Arrangements, Benefits and Challenges

The "regional level," the role of which is instrumental in international environmental policy and law, has unique significance in ocean governance for biodiversity in ABNJ especially considering the need for an integrated and

**TABLE 1 |** Attributes and enabling conditions for functional polycentric governance (Carlisle and Gruby, 2019).**Attributes**

Attribute 1: Multiple, overlapping decision-making centers with some degree of autonomy.

Attribute 2: Choosing to act in ways that take account of others through processes of cooperation, competition, conflict and conflict resolution.

**Enabling conditions**

Enabling Condition 1: Decision-making centers employ diverse institutions.

Enabling Condition 2: Generally applicable rules and norms structure actions and behaviors within the system.

Enabling Condition 3: Decision-making centers participate in cross-scale linkages or other mechanisms for deliberation and learning.

Enabling Condition 4: Mechanisms for accountability exist within the governance system.

Enabling Condition 5: A variety of formal and informal mechanisms for conflict resolution exist within the system.

Enabling Condition 6: Decision making centers exist at different levels and across political jurisdictions.

Enabling Condition 7: The jurisdiction or scope of authority of decision-making centers is coterminous with the boundaries of the problem being addressed.

coherent ecosystem-based approach to ocean management and the transboundary characteristics of marine issues (IOC-UNESCO, 2014; Rochette et al., 2015; Gjerde and Wright, 2019; PROG, 2021). Regional ocean governance has gained increased attention of late, mainly due to its reinforcement in the SDG 14 and the wider 2030 Agenda (UNGA, 2015; UNEP, 2016; Wright et al., 2017; Mahon and Fanning, 2019b). When compared with exclusively national or global approaches, there are clearly a number of distinctive advantages associated with the regional level: better consideration of the uniqueness of a marine ecosystem prior to policy development and implementation, customized management of a given region, facilitation of cooperative action through typically fewer players with shared history, potential for more effective coordination and cooperation across sectors and geopolitical boundaries, all essential elements for functional polycentric governance (Rochette et al., 2014; Biggs et al., 2015; Wright et al., 2017; Gjerde and Wright, 2019; Yadav and Gjerde, 2020; PROG, 2021). However, it needs to be recalled that some of the premises for regional ocean governance, that all share the same values, goals and objectives, may be strained as membership of regional (or global) management bodies focusing on resources or uses primarily in ABNJ may be dominated by States from outside the region giving rise to power asymmetries and conflicting interests (Gjerde and Wright, 2019).

Regional ocean governance is said to involve five types of institutions or arrangements, some long-established while others relatively more recent, as shown by Wright et al. (2017): (1) Regional Seas Conventions and Action Plans (Regional Seas or RSCAPs), many of which are managed or supported by United Nations Environment Programme (UNEP); (2) Regional Fisheries Bodies (RFBs) including many that have been established under the United Nations Food and Agriculture Organisation (FAO); (3) Political and economic communities that aim to address ocean issues at the regional level, e.g., the Caribbean Community (CARICOM), the European Union (EU), the African Union (AU), among others; (4) Leader-driven initiatives, for example, the Micronesia Challenge, the Pacific Oceanscape, and the Western Indian Ocean Coastal Challenge, among others, which are regional initiatives set up by heads of States and other leaders; and (5) Large Marine Ecosystem (LME) mechanisms supporting transboundary management largely between coastal states, which the Global Environmental Facility (GEF) has played a

significant role in supporting. Political/economic integration arrangements, leader-driven initiatives, LMEs, and other arrangements developed specifically by countries in the region (Mahon and Fanning, 2019a) can be important vehicles to address mismatches between externally imposed Regional Seas and RFMO regions and bio-regional ecosystems but are often non-binding.

**Table 2** shows the geographical scope of the various regional ocean governance arrangements, highlighting whether they include areas within or beyond national jurisdiction, or both in some cases. While each type of mechanism mentioned above has its own advantages and may have contributed to strengthening ocean management, none individually is sufficient in mandate or geographic scope to deal with the multitude of growing anthropogenic threats to BBNJ (Galaz et al., 2012; Fanning et al., 2015; Rochette et al., 2015; UNEP, 2016; Durussel et al., 2018; Gjerde and Harden-Davies, 2018; Ortuño Crespo et al., 2019).

The challenge is that most of these regional ocean governance arrangements (other than RFMOs) were designed to focus primarily on areas and issues within national jurisdiction. Scaling these arrangements up to fully embrace and consider biodiversity and ecosystem-based management in ABNJ presents a new array of issues. Human activities occurring in ABNJ are mainly regulated sectorally by organizations including RFMOs, IMO and ISA (Ringbom and Henriksen, 2017; UNEP-WCMC, 2017; Blasiak et al., 2020; Yadav and Gjerde, 2020). The current fragmented framework hampers coordination and integration to address critical issues including biodiversity, pollution, climate change, ecosystem health and fisheries (Galaz et al., 2012; Fanning et al., 2015; Mahon et al., 2015; UNEP, 2016; Ortuño Crespo et al., 2019).

This fragmentation can be exacerbated as sectoral institutions *via* their members often act on divergent and conflicting principles and values (Barkin et al., 2018; Yadav and Gjerde, 2020) and risk tolerances for environmental harm (Rice and Garcia, 2011), with few interactions and thus poor sharing of knowledge among key ocean stakeholders (Vousden, 2015; Harrison, 2017; Alexander and Haward, 2019; Gjerde and Wright, 2019; UNEP-WCMC, 2019). Power dynamics and asymmetries may further influence outcomes. For example, IMO, ISA and RFMOs have the power to set rules binding upon their member states, whereas Regional Seas organizations and most international conservation agreements such as the Convention on Biological Diversity (CBD) primarily recommend, advise and coordinate (Gjerde et al., 2019). Various domestic drivers

**TABLE 2 |** Geographical extent of regional ocean governance arrangements.

| Regional ocean governance arrangement      | Geographical extent   |
|--|---|
| Regional Seas Conventions and Action Plans | Generally cover coastal areas up to the outer limits of EEZ. Only four regional systems (Antarctic, Mediterranean, North-East Atlantic and South Pacific) have specific mandates to cover ABNJ as well.   |
| Regional Fisheries Bodies                  | RFBs can be divided into 3 categories: (1) Both ABNJ and coastal State maritime zones, (2) only or mainly ABNJ, and (3) only coastal state maritime zones Note: Of the RFBs, only regional fisheries management organizations (RFMOs) can adopt management measures in ABNJ; some RFMOs focus on tuna or tuna-like species, others focus on a region but may not cover all fish species (Ortuño Crespo et al., 2019). |
| Political and economic organizations       | The scope of this arrangement varies greatly depending on the political and economic organizations themselves.  |
| Leader-driven initiatives                  | Mainly covers challenges in the coastal and marine environments of the given countries and jurisdictions with shared resources and common concerns.   |
| Large Marine Ecosystem (LME) mechanisms    | The geographical extent of an LME is based on ecological criteria: (1) bathymetry, (2) hydrography, (3) productivity, and (4) trophic relationships (Sherman, 1994; Vousden, 2015). LMEs mainly consist of EEZs and territorial waters only (coastal State maritime zones). However, a few LMEs do include nearby ABNJ.   |

Sources: Rochette et al. (2015), UNEP (2016), and Wright et al. (2017).

of international fisheries policies (Barkin et al., 2018) as well as consensus-requirements for decision-making within RFMOs may help to explain why certain RFMOs have been slow to advance measures necessary for ecosystem-based approaches to fisheries such as assessing fisheries impacts, reducing by-catch, increasing observer coverage and reporting, or limiting impacts on dependent and associated species and ecosystems (Gjerde et al., 2013, 2021; Ortuño Crespo et al., 2019). The study by Barkin et al. (2018) establishes a framework for considering the extent to which differing national policies and priorities may affect RFMO decision-making and fisheries policies “from those that in practice support sustainable management to those that seem implicitly committed to fishing as much as possible in the short term” (Barkin et al., 2018, p. 256). A similar framework could presumably be applied to other sectors to better understand and potentially reduce the differences between sectoral outcomes. Furthermore, regional cooperation is more complicated when it comes to ABNJ because of their “commons” (open access) status with regard to access and exploitation of marine resources (Vousden, 2015, p. 393).

Implementation of tools that could enhance cross-sectoral integration focused on ocean health and resilience, such as ecosystem-based integrated ocean management (Lieberknecht, 2020) or Marine Spatial Planning (MSP) remain weak in ABNJ (UNEP-WCMC, 2019). International or transboundary interactions that are required for effective management of the ocean continue to face the “Tragedy of the Commons” problem which refers to the theory that actors who operate individually and on the basis of their own self-interest, would act contrary to the greater good of a larger stakeholder group by exhausting a common resource for their own respective individual advantages (Hardin, 1968; Basurto and Ostrom, 2009; Vousden, 2015; Gjerde and Harden-Davies, 2018). The governance of ocean resources and marine biodiversity represents a typical collective action problem where individual goals may be in conflict with broader societal goals, but also where polycentricity has potential for providing solutions (Olson, 1965; Schoon et al., 2015; Bodin, 2017).

Considering the scope of the Special Issue, one of the five types of regional ocean governance arrangements—the LME mechanisms—is analyzed in section “Large Marine Ecosystems”

as it is the most focused on advancing ecosystem-based management at a biophysically-based sub-regional scale.

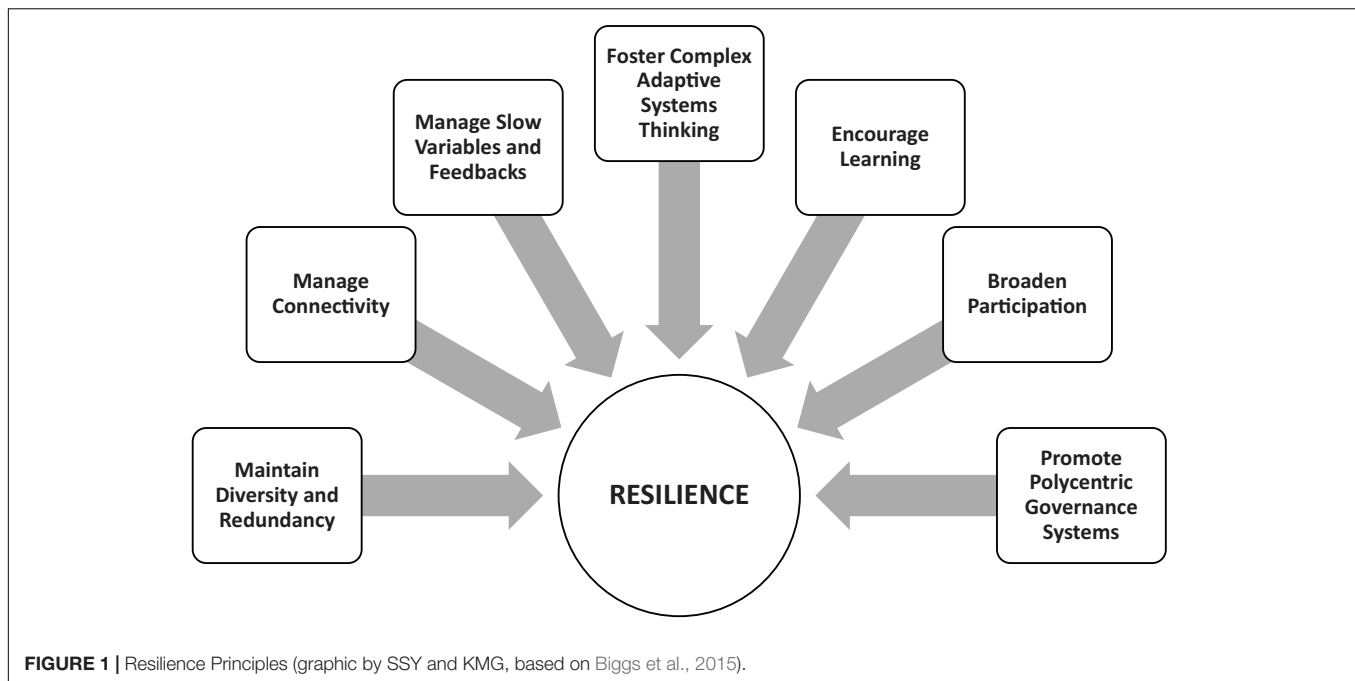
## MATERIALS AND METHODS

This article applies some of the key studies on polycentricity (Ostrom et al., 1961; Ostrom, 1999, 2000, 2010; Galaz et al., 2012; Biggs et al., 2015; Schoon et al., 2015; Jordan et al., 2018; Carlisle and Gruby, 2019; Mahon and Fanning, 2019b; Mahon and Fanning, 2019a) to analyze polycentricity in regional arrangements relevant to BBNJ, what the key challenges related to polycentricity are, how they could be addressed, and the lessons offered for the BBNJ Agreement.

Its approach builds on the analysis and application of resilience-enhancing principles in the context of ocean ABNJ in Yadav and Gjerde (2020). **Figure 1** shows the seven resilience principles, developed by the Stockholm Resilience Centre (Biggs et al., 2015) and applied in Yadav and Gjerde (2020): Principle 1—Maintain Diversity and Redundancy; Principle 2—Manage Connectivity; Principle 3—Manage Slow Variables and Feedbacks; Principle 4—Foster Complex Adaptive Systems Thinking; Principle 5—Encourage Learning; Principle 6—Broaden Participation; and Principle 7—Promote Polycentric Governance. Yadav and Gjerde (2020) thoroughly engaged with the Stockholm Resilience Centre’s resilience framework, highlighting how each of the seven principles could be applied and operationalized in the context of ABNJ governance.

This article seeks to move forward from the application of all the seven principles to a more focused analysis of polycentricity as there are assumptions about the implicit effectiveness of “promoting polycentric governance” in the Stockholm Resilience Principles that are important to clarify for ABNJ. In particular, polycentricity theory has implications for many open issues in the ongoing BBNJ negotiations including the future institutional framework, relationships with other bodies, responsibilities for implementation, and questions of “undermining,” among others.

To analyze polycentricity in regional ocean governance clusters relevant to ABNJ, this article takes into account the study of Mahon and Fanning (2019a,b) in which they have defined 20 ocean regions globally and evaluated the extent to which governance polycentricity could be applied in these regions,



based on the polycentricity criteria developed by Jordan et al. (2018). The 20 ocean regions defined globally by Mahon and Fanning (2019b) are: (1) Antarctic, (2) Arctic, (3) Baltic Sea, (4) Black Sea, (5) East Central Pacific, (6) Eastern Indian Ocean, (7) Mediterranean Sea, (8) Northeast Atlantic, (9) Northeast Pacific, (10) Northwest Atlantic, (11) Northwest Pacific, (12) Pacific Islands Region, (13) Red Sea, (14) ROPME, (15) Southeast Asia, (16) Southeast Pacific, (17) Southeast Atlantic, (18) Southwest Atlantic, (19) Western Central Atlantic, and (20) Western Indian Ocean. For the assessment of polycentricity in the context of ABNJ governance, this article draws on the findings of the “*Transboundary Waters Assessment Programme (TWAP) Assessment of Governance Arrangements for the Ocean, Volume 2: Areas Beyond National Jurisdiction*” by Mahon et al. (2015).

The article then applies the studies and lessons learned from polycentricity theories including Carlisle and Gruby’s model, the Stockholm Resilience Centre’s resilience framework, and LME sub-regional cooperation mechanisms, to derive considerations for advancing a more functional polycentric governance system for integrated ecosystem-based biodiversity conservation and sustainable use through the BBNJ Agreement.

## RESULTS

### Applying Polycentricity Concepts to Regional Ocean Governance Arrangements for ABNJ

Prior to exploring the implications of polycentricity thinking in the context of ABNJ governance, it is necessary to first analyze the degree of polycentricity in the regional clusters of intergovernmental agreements and

bodies related to ecosystem-based ocean management as shown by Mahon and Fanning (2019a).

As noted above, Mahon and Fanning (2019a) analyzed the regional clusters of agreements in 20 ocean regions (see Section “Materials and Methods” above). To measure the extent to which the regional clusters meet the criteria for polycentricity, Mahon and Fanning (2019a) used the five propositions developed by Jordan et al. (2018): local action, mutual adjustment, experimentation, trust, and overarching rules. They categorized the levels of polycentricity on a spectrum from *centralized authority* to *functional polycentric* (when the criteria of polycentricity given by Jordan et al. (2018) are fully met) with the following levels in between: *fragmented polycentric* (when there is little or no interaction among the arrangements), *polycentric bricolage* (when there are clear efforts by some participating bodies to manage the existing set of arrangements to address gaps or overlaps, and enhance effectiveness), and *polycentric codesigned* (when these efforts involve cooperation and establishing integration mechanisms in deliberately reorganizing the existing set of arrangements) (Mahon and Fanning, 2019a).

In their analysis, Mahon and Fanning (2019a) found that only 2 of the 20 ocean regions – Arctic and the Pacific Islands Region – met the criteria for polycentricity of Jordan et al. (2018). The extent of polycentricity in several other regional clusters was found to be weak and fragmented. Two regions—Antarctic and Southeast Pacific were found to have long-standing mechanisms for coordination that were comparatively centralized. Mahon and Fanning (2019a, p. 6, emphasis added) concluded that “it is appropriate to refer to the majority of regional clusters as polycentric systems *in various stages of becoming functional*.”

Several regional clusters could qualify as “*polycentric*” mainly because of the involvement of multiple centers of

decision-making at differing scales (Cleaver and de Koning, 2015; Abe et al., 2016; Vousden, 2016; Mahon and Fanning, 2019a). However, even though they did qualify as *polycentric*, they could not necessarily qualify for the *functional polycentric* category because of lack of coordination and integration mechanisms (Mahon and Fanning, 2019a). The Pacific Islands Region, for instance, on the other hand qualified for the functional polycentric category because of its stronger coordination and integration mechanisms under the Pacific Island Forum (PIF) (Mahon and Fanning, 2019a).

This link between functional polycentricity and processes of coordination and integration among the decision-making actors has implications for polycentricity in ABNJ governance as well (Mahon et al., 2015). Mahon et al. (2015) in their study on ABNJ governance show that coordination and integration among arrangements to manage issues including climate, pollution, fisheries and biodiversity in ABNJ are weak, despite the wide range of regional and global conventions, treaties and other arrangements. This weakness in coordination and integration processes among actors in ABNJ governance is the reason why a key theoretical attribute for functional polycentric governance in Carlisle and Gruby's (2019) model described in Section "Polycentricity and Regional Ocean Governance" is not achieved.

The analysis of regional clusters has further implications for wider ocean governance including ABNJ. One reason is the interconnected nature of the ocean, whereby activities in one State or region could have an impact on other States and regions, including ABNJ (Harrison, 2017). For instance, even though pollution from land-based activities originates within the jurisdiction of one State, it could spread beyond the State's coastal waters and end up impacting marine biodiversity in ABNJ (Mahon et al., 2015; Harrison, 2017). In this case, regional agreements addressing land-based sources of pollution can be linked directly to ABNJ (Mahon et al., 2015).

Given the interconnected nature of the ocean, it is not just the horizontal linkages among actors at the regional level but also the vertical linkages among other jurisdictional levels including local, national, and global, that are critical for ABNJ governance (Fanning et al., 2007, 2021; Mahon et al., 2015). Furthermore, the analysis of regional clusters is relevant for the global ocean governance including ABNJ, especially because regional agreements can act as action points for customizing global agreements to specific geographical areas which is essential for advancing ecosystem approach (Mahon et al., 2015). "Strengthening regional clusters of agreements, particularly so that they can undertake EBM (ecosystem-based management) in offshore waters and ABNJ, is seen as a critical component of strengthening ABNJ governance" (Mahon et al., 2015, p. 64). Implementation of the BBNJ agreement, therefore, will depend greatly on regional efforts and their effectiveness.

## Challenges in Achieving Functional Polycentric Governance in ABNJ

As analyzed on the basis of the attributes (see Table 1) proposed in the theoretical model of Carlisle and Gruby (2019), ABNJ governance does not fully meet the criteria for functional

polycentric governance. It is the failure to achieve the second attribute, "*choosing to act in ways that take account of others through processes of cooperation, competition, conflict and conflict resolution*," that forms the key challenge in achieving functional polycentric governance.

Criteria for the first attribute "*multiple, overlapping decision-making centers with some degree of autonomy*" are fulfilled due to the existence of a multiplicity of decision-making centers in ABNJ governance in the form of various regional and global conventions, treaties, and other arrangements (Mahon et al., 2015). While this multiplicity of decision-making centers is sufficient for a *polycentric system*, it is not for a *functional polycentric governance system* (Ostrom et al., 1961; Carlisle and Gruby, 2019). To achieve the latter, the second attribute is required as well. Given that the coordination and integration processes among these regional and global arrangements in ABNJ governance remain weak, as shown by Mahon et al. (2015), the criteria for the second attribute are not fully achieved.

Since the second attribute is largely missing, several of the "enabling conditions" identified by Carlisle and Gruby (2019, p. 946) associated with this attribute are also weak, if not absent. Drawing from Table 1 above, these include five of the seven enabling conditions: (2) generally applicable rules and norms that structure actions and behaviors within a system; (3) cross-scale linkages for collaboration and shared learning; (4) mechanisms to ensure accountability in the governance systems; (5) mechanisms to enable conflict resolution; and (7) co-terminus jurisdiction or scope of decision-making authority with boundaries of the problem being addressed, i.e., the boundaries necessary for global biodiversity conservation as well as bio-regionally based ecosystem-based management. Similarly, three of the five propositions developed by Jordan et al. (2018) are lacking: mutual adjustment, trust, and overarching rules. Taking all the factors into account, the key challenges of achieving effective polycentric ocean governance could thus be encapsulated under three main categories as follows:

### Lack of Overarching Rules and Norms to Structure Cooperation and Coordination

In order to function as a system, it is essential for polycentric governance systems to have coordination under an overarching system of rules (Pahl-Wostl and Knieper, 2014). It is under such a shared set of rules, norms, principles and obligations that the various regional and sectoral actors would be better able to interact on a more level playing field (Yadav and Gjerde, 2020). While UNCLOS could be considered to provide a set of overarching rules, it is the absence of rules, standards and procedures for protection and preservation of the marine environment including ocean life in ABNJ, as envisaged in UNCLOS Articles 192 and 197, that provided the impetus for the BBNJ Agreement. The lack of such rules also inhibits cross-scale linkages, shared learning and accountability for players who do not abide by the overarching rules and norms (enabling conditions 2, 3, and 4).

## Lack of Conflict Resolution Mechanisms

Conflict resolution mechanisms (enabling condition 5) have been given special emphasis in polycentric governance literature. For Ostrom et al. (1961), a polycentric system would be composed of multiple autonomous units choosing to act in ways that consider others through processes including conflict resolution. Carlisle and Gruby (2019, p. 935) argue that “maintaining the capability to resolve conflict is critical.” Conflict resolution mechanisms in the BBNJ Agreement could contribute in many ways, from building trust that all players are more likely to play by the rules to enabling mutual adjustment despite differences in power and priorities. Provisions for enhanced cooperation and conflict resolution could thus support more effective ecosystem-based management at all levels in ABNJ (WWF, 2016). Given the importance of conflict resolution mechanisms in polycentric governance, its absence in the current ocean governance framework continues to be a critical challenge.

## Lack of Global and Eco-Regional Levers for Action

As the global ocean is both interconnected and comprised of numerous interlocking ecosystems, multiple levers are needed to meet enabling condition 7: “*co-terminus jurisdiction or scope of decision-making authority with boundaries of the problem being addressed.*” The global level is needed for its ability to: define rules and norms to structure actions and behaviors within ABNJ; set out ambitious priorities for global scale biodiversity conservation; act directly and in collaboration with other institutions; establish, manage and support cross-scale linkages for collaboration and shared learning; ensure accountability of the various components within the system; resolve conflicts between the different sectors, as well as between sectoral activities and biodiversity concerns; and provide the necessary redundancy in cases where one or more institutions is unable or unwilling to act (enabling conditions 2, 3, 5, and 7). At the same time, cooperative mechanisms are needed at ecologically meaningful regional or subregional scales to advance integrated ecosystem-based management. As noted, LME approaches that promote collective investigation, strategic planning and collaboration to enable shared learning, understanding, mutual adjustment and cooperation, could provide a useful model.

## Large Marine Ecosystems

Large Marine Ecosystems (LMEs) are relatively large regions of ocean (approximately 200,000 km<sup>2</sup> or higher), which are adjacent to the continents in coastal waters and where primary productivity is mostly greater than in open oceans (CBD, 2009; Rochette et al., 2015; Vousden, 2015; Wright et al., 2017). Currently, 66 LMEs have been recognized globally on the basis of a concept developed by the United States’ National Oceanic and Atmospheric Administration (NOAA) (Fanning et al., 2015; UNEP, 2016). The physical extent of an LME is not determined on the basis of geopolitical or economic factors, but on four ecological criteria instead: (1) bathymetry, (2) hydrography, (3) productivity, and (4) trophic relationships (Sherman, 1994; Vousden, 2015). The GEF has played a significant role in promoting the concept of LMEs through 18 LME projects and

initiatives addressing 24 LMEs (Mahon et al., 2011; Vousden, 2015; UNEP, 2016; Harvey et al., 2017).

Large Marine Ecosystem mechanisms typically include a Transboundary Diagnostic Assessment (TDA) and subsequent negotiation of a Strategic Action Programme (SAP) to guide recovery and sustainability. TDAs are comprehensive assessments to provide the science and socio-economic basis for ecosystem-based management (Bensted-Smith and Kirkman, 2010; Rochette et al., 2015; UNEP, 2016). The TDA process brings together local/regional experts to strategically examine and investigate priority impacts, analyze the causes or drivers of those impacts, diagnose the root causes and also identify barriers to removing those root causes to improve the welfare and sustainability of the LME, its goods and services and dependent communities (Sherman and Hempel, 2008; UNEP, 2016; GEF LME:Learn, 2017; UNDP, 2017). The TDA not only enables comprehensive assessments of the environment but also facilitates a broad and diverse participation at all levels and encourages inter-ministerial and multi-stakeholder dialogue (Duda and Sherman, 2002; Rochette et al., 2015). Sherman and Hempel (2008, p. 7) observe that the TDA “provides a useful mechanism to foster participation of policy makers, scientists, management experts, stakeholders, and civil society at local, regional, national and international levels of interest.” Such participation of a diversity of stakeholders helps build trust and relationships, and promotes shared learning and understanding, therefore enhancing institutional resilience (Biggs et al., 2015; Leitch et al., 2015; Lieberknecht, 2020).

Strategic Action Programme processes, based on the findings of the TDA, foster an agreed vision, a set of Ecosystem Quality Objectives and steps to be taken to remove the barriers to action (UNDP, 2017). The SAP further identifies the mechanisms for action to achieve the Ecosystem Quality Objectives, applies those objectives as a way to measure and monitor progress, and thereby can deliver both accountability and capacity for adaptive management (Duda and Sherman, 2002; Sherman and Hempel, 2008). The LME: Learn component complements these efforts by enhancing learning exchange between and amongst the regions (GEF LME:Learn, 2017). Such a science-based approach including shared and cooperative monitoring and assessment processes can encourage transparency and accountability, facilitate collaborative learning and governance, build trust among nations, thus fulfilling many (but not all) of the key enabling conditions for more effective polycentricity (Duda and Sherman, 2002; Bodin, 2017; Carlisle and Gruby, 2019; Yadav and Gjerde, 2020).

While the LME projects offer valuable lessons for building trust and understanding, and fostering effective collaboration (Mahon et al., 2011; Fanning et al., 2015; Vousden, 2015), they face their own set of challenges mainly related to governance. It has been shown that even though LME mechanisms do offer a robust scientific foundation for action, they often face governance challenges (Rochette et al., 2015), for instance, the science activities in their modular approach “stand alone from governance, rather than in support of it” (Mahon et al., 2009, p. 318). Moreover, the LME governance arrangements are often not connected to existing arrangements leading to

minimal uptake of progress made after the completion of an LME project, have poor levels of cooperation with other regional arrangements, and may also face financial sustainability issues (Rochette et al., 2015; Vousden, 2015; UNEP, 2016; Mahon and Fanning, 2019b).

Despite these challenges, the LME-approach may offer a valuable model for advancing ecosystem-based management at a bio-regional scale entirely within or including ABNJ, if prior LME-specific and wider polycentricity lessons are applied. The first experiment with an LME-style project for ABNJ is now underway in the Sargasso Sea as the GEF has recently approved a project for improving science-based management and stewardship in the region (Freestone, 2021).

## DISCUSSION

### Implications for the BBNJ Agreement

If the challenges to achieving functional polycentric governance for ABNJ (as highlighted above) are addressed, a number of benefits associated with effectively functioning polycentric governance systems should be more likely to be achieved. Biodiversity benefits include enhanced ocean resilience to future shocks and shifts from climate change, other pressures, and their cumulative effects. Institutions could become more resilient, in the form of a feedback loop, through the very processes (such as fostering cooperation, learning, trust, adjustment and coordination) that are necessary for strengthening polycentricity in the first place. This is because polycentric governance is said to enhance other resilience-enhancing principles by: enabling broader participation of stakeholders and decision-makers; improving trust and cooperation among these actors; increasing accountability; maintaining response diversity, redundancy and improving connectivity (Low et al., 2003; Biggs et al., 2015; Schoon et al., 2015; Carlisle and Gruby, 2019; Yadav and Gjerde, 2020). Moreover, polycentric governance is also better suited to managing complex adaptive systems, the key characteristics of which are clearly reflected in marine ecosystems and their governance systems (Young, 2002; Kim and Mackey, 2004; Galaz et al., 2008; Bohensky et al., 2015; Blanchard et al., 2019; Yadav and Gjerde, 2020).

The following recommendations are suggested on the basis of the seven enabling conditions in the theoretical model of Carlisle and Gruby (2019), the Stockholm Resilience Centre's seven resilience principles, as well as lessons offered by LME approaches. The specific enabling condition and/or resilience principle to which any particular recommendation can be linked is shown in brackets where applicable:

### Overarching Rules, Goals, and Objectives (Enabling Conditions 2, 4)

The BBNJ Agreement could advance cooperative and collaborative interactions by establishing core obligations, objectives, values and principles. These could include conservation of biodiversity, integrated ecosystem and precautionary approaches, as well as principles to build ecological

and institutional resilience, among others. Such principles and accompanying rules and objectives would guide the behavior of States Parties, other States and stakeholders in multiple global, regional and sectoral arenas (Yadav and Gjerde, 2020). Moreover, principles to promote good governance, trust and accountability including open communication, broad participation, efficiency, and strong collaborative platforms need to be given priority in the BBNJ institutional arrangements in order to contribute to effective polycentric governance of the ocean (Gunderson, 2000; Goldstein, 2011; Schoon et al., 2015; Gjerde et al., 2019; Yadav and Gjerde, 2020).

### Formal and Informal Conflict Resolution Mechanisms (Enabling Condition 5)

As shown previously, the absence of conflict resolution mechanisms in the current ocean governance and management framework continues to be a critical challenge in achieving functional polycentric governance. A global mechanism for conflict resolution could serve to mediate any conflicting interests and power imbalances in a fair, equitable and consistent manner to advance ocean health and resilience (Harden-Davies et al., 2020). A strong mandate for conflict resolution in the BBNJ institutional arrangements that could offer a diversity of formal and informal conflict resolution forums and approaches such as conciliation, mediation, and arbitration, as well as including participatory and dynamic processes built into multiple layers could be crucial (Dietz et al., 2003; WWF, 2016; Carlisle and Gruby, 2018, 2019). Such conflict resolution processes particularly if open to States, international organizations as well as representatives of civil society could complement but also potentially lessen the need to rely on more formal dispute resolution processes.

### Robust Global Institutional Arrangements (Enabling Conditions 2, 4, and 7)

An empowered global Conference of Parties is necessary to ensure that the scope of authority of at least one decision-making center is "coterminous with the boundaries" of the global biodiversity problems being addressed (enabling condition 7). A Conference of Parties supported by a strong Secretariat could simultaneously serve to promote universal participation, harmonize UNCLOS with the Sustainable Development Goals (SDGs), CBD, CITES, CMS and other instruments, strengthen coordination, integration and conflict resolution mechanisms, while enabling participation of all stakeholders (Mahon et al., 2015; O'Leary and Roberts, 2017; Mahon and Fanning, 2019a; Yadav and Gjerde, 2020). An independent globally-focused scientific and technical advisory body could ensure an authoritative voice and global perspective regarding conservation measures such as MPAs and EIAs, with the BBNJ Conference of Parties empowered to adopt protective measures for MPAs and impose conditions for approval of EIAs. The BBNJ global body could thus have independent authority with responsibility for advancing global biodiversity interests in consultation with sectoral and regional organizations as well as the CBD, CITES and CMS (Yadav and Gjerde, 2020).

### **Strengthened Global, Regional and Sectoral Bodies With Shared and Overlapping Responsibility for Biodiversity Conservation (Enabling Conditions 1–7; Resilience Principles 1 and 6)**

Institutional redundancy forms a critical enabling condition for polycentricity given the high likelihood of any one institution failing to be effective (Ostrom, 1999, 2012; Carlisle and Gruby, 2019). As part of sharing responsibility for biodiversity conservation, a diversity of organizational arrangements and bodies with overlapping mandates and participants ensures that any failure could be compensated by other actors (Ostrom, 2005; Carlisle and Gruby, 2019; Yadav and Gjerde, 2020). Thus, recognizing the authority of State Parties to act collectively *via* the Conference of Parties to adopt measures to protect marine biodiversity in ABNJ binding on themselves is an essential safeguard. This is especially true as long as sectoral bodies can be blocked from adopting conservation measures due to the ability of one or two powerful States to block consensus. At the same time, the BBNJ Agreement can enable sectoral and regional bodies to advance global and regional biodiversity goals in ABNJ through access, for example, to scientific information, financial and technical resources, needs-based capacity development, and partnerships, balanced by increased accountability including calls to reform decision-making processes. Multi-scale and cross-sectoral partnerships and alliances among States, political and economic organizations, the CBD, CMS, and CITES, sectoral and regional bodies, scientific and other academic institutions, private sector, environmental NGOs and other ocean stakeholders based on shared principles and norms would further enhance institutional redundancy, shared learning and mutual adjustment (Biggs et al., 2015; Schoon et al., 2015; Vousden, 2015).

### **Strengthened Cross-Sectoral Cooperation Through Ecosystem Assessments and Strategic Action Programmes at Ecologically Meaningful Scales That Could Include Areas Within and Beyond National Jurisdiction (Enabling Condition 3; Resilience Principle 5)**

As with the LME approaches described above, regional scale collaboration for ecosystem-based management could be fostered by the BBNJ Agreement through support for a form of strategic environmental assessment (SEA) that supports regional-scale ecosystem diagnostic analyses and accompanying Strategic Action Programmes. Such efforts, supported by some form of regional coordinating mechanism with powers developed from the BBNJ Agreement could advance ecological and biodiversity related objectives involving all stakeholders interested in taking part. The regional-scale transboundary/ABNJ LME-style process could be used as part of an SEA under the BBNJ Agreement to generate new scientific knowledge to inform ecosystem-based management, enable States and other stakeholders to identify the common issues, threats, causes and barriers, and together identify and commit to taking the necessary actions to address the threats and their causes. Such efforts could complement proposals for MPAs, inform other types of area-based management tools, and provide the basis for adaptive management and

EIAs (Gjerde et al., 2021). They could similarly complement other ocean-basin scale and transboundary initiatives such as protecting highly migratory species. Such efforts could build on the example of the recently approved GEF program for the Sargasso Sea in ABNJ.

### **Learning Exchange Mechanisms Within and Across Regions (Enabling Condition 3, Resilience Principle 5)**

Setting up learning exchange mechanisms in and across the regions, akin to LME: Learn, so that the regional decision-making centers are able to learn from one another as they advance, is essential for ensuring coordination and integration, and for more effective polycentricity (Tatenhove et al., 2014; Alexander and Haward, 2019; Carlisle and Gruby, 2019; Mahon and Fanning, 2019a). Learning is crucial for building ecological and institutional resilience (Biggs et al., 2015; Cundill et al., 2015). The scientific and technical body under the BBNJ treaty could prioritize collaborative research, monitoring of key indicators, and data sharing, as well as be informed by the outcomes of the UN Decade of Ocean Science for Sustainable Development (2021–2030), and other global and regional scientific initiatives (Vousden, 2015; Yadav and Gjerde, 2020). Local, indigenous and traditional knowledge should be taken into account as well (Mulalap et al., 2020; Vierros et al., 2020). The scientific and technical body could also ensure that the knowledge is obtained, shared and communicated through effective science-policy advisory mechanisms (Gjerde and Wright, 2019).

### **Strengthened Regional and National Capacities for Ecosystem-Based Management of Marine Biodiversity in ABNJ**

The capacity development initiatives being negotiated in the BBNJ treaty under the fourth element “Capacity Building and Transfer of Marine Technology” are also relevant for strengthening polycentric ocean governance. To strengthen institutional and individual capacities for managing a shared ocean, the BBNJ Agreement would need to go beyond short-term workshops to build long term-capacity for science, ecosystem-based management, administration and collaborative governance, taking into account specific national and regional needs (Bodin, 2017; Harden-Davies, 2017; Gjerde and Wright, 2019; Harden-Davies and Snelgrove, 2020). This capacity building could learn from the LME experiences and in turn the institutional framework for the BBNJ Agreement could provide an international forum to foster coordination, exchange innovative ideas, and drive ambition for capacity building outcomes.

### **Future Research**

Development and implementation of conflict resolution mechanisms in the context of ocean governance is an important area that calls for further research and discussion. As highlighted in many studies, conflict resolution mechanisms are crucial for strengthening polycentricity. However, there is a lack of understanding around how to operationalize them in the case of ocean governance. The 2016 WWF introductory briefing

on “*Matters for inclusion in a new international legally-binding instrument under UNCLOS: enhanced cooperation and effective dispute resolution*” is the only study to date on this issue in the context of the BBNJ Agreement (WWF, 2016). More exploration is needed of how such mechanisms can influence the cooperation of States and intergovernmental bodies especially in the context of cross-sectoral collaboration. Furthermore, as there is a major lack of research and scientific understanding of power and political dynamics in ABNJ, a power-centered analysis of regional and high seas governance would be an important future research area (Morrison et al., 2019, 2020). The power dynamics in polycentric systems are complicated to identify and concealed to a greater degree as compared to other governance forms (Morrison et al., 2019). More empirical research is required with regard to political dynamics such as political lobbying and tradeoffs in the context of polycentric ocean governance, as has been highlighted in the case of multiscale environmental governance of World Heritage ecosystems (Morrison et al., 2020) and international fisheries policies (Barkin et al., 2018). The Barkin et al. (2018) framework could presumably be applied to other sectors to better understand and potentially reduce the differences between sectoral and conservation outcomes. Moreover, further research on enhancing the resilience and adaptive capacity of the BBNJ Agreement itself (Blanchard et al., 2019; Yadav and Gjerde, 2020) so that it is possible to embrace novel and innovative ecological thinking and management measures over time would be useful, and lessons can be learnt from the successes

and failures experienced in other sectors such as watershed management (Bridgewater and Kim, 2021).

## DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

## AUTHOR CONTRIBUTIONS

SSY and KMG conducted the research and wrote the manuscript. Both authors contributed to the article and approved the submitted version.

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# Towards an Ecosystem Approach to Management in Areas Beyond National Jurisdiction: REMPs for Deep Seabed Mining and the Proposed BBNJ Instrument

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The ocean plays a key role in sustaining life on our planet and is inextricably linked to biodiversity, climate, human well-being, and health. However, the governance of the ocean is primarily pursued through sectoral-based legal and institutional frameworks that falls short in ensuring the long-term protection of the marine environment and the sustainability of marine resources. This is especially concerning in areas beyond the limits of national jurisdiction (ABNJ) where human activities continue to expand. The existence of two distinct regimes in ABNJ, namely the High Seas (applicable to the water column, which is a global common) and the Area (applicable to the international seabed and its mineral resources, which are the common heritage of mankind), that have been largely regulated separately, impede the development and implementation of integrated marine environmental governance and biodiversity conservation in ABNJ. On the one hand, the International Seabed Authority (ISA), which is mandated to administer the mineral resources of the Area, is currently discussing a set of regulations to enable future exploitation activities. On the other hand, multilateral negotiations are taking place for the development of an internationally legally binding instrument for the conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction (referred to as the proposed 'BBNJ' Instrument). Both processes offer a unique opportunity to foster an ecosystem approach to management (EAM) in ABNJ. In this article, we elaborate on options for stronger governance integration and the development of a coherent and collaborative interplay between these two processes. To this end, we explore the potential of Regional Environmental Management Plans (REMPS) established by the ISA as a case study to contribute to global biodiversity conservation, and the opportunity for the proposed BBNJ

Instrument to promote overarching coherence to biodiversity conservation in ABNJ, premised on EAM. We conclude that the proposed BBNJ Instrument could have a pivotal role to streamline multilateral action for the conservation of biodiversity in ABNJ by adopting an ambitious, overarching environmental vision and strategic goals, accompanied by strong implementation and enforcement mechanisms.

**Keywords:** ocean governance, Areas Beyond National Jurisdiction (ABNJ), BBNJ Instrument, International Seabed Authority (ISA), deep seabed mining, Regional Environmental Management Plan (REMP), ecosystem approach to management

## 1 INTRODUCTION

The ocean plays a key role in sustaining life on our planet and is inextricably linked to biodiversity, climate, human well-being, and health. It is the world's single largest ecosystem, with migration and sound communication of species that happens across thousands of kilometers, and complex food webs connected throughout the water column. Today, the ecological state of the ocean continues to deteriorate at an unprecedented rate (Independent Group of Scientists appointed by the Secretary-General, 2019; Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), 2019; IPCC, 2019; Nash et al., 2020) and the limits of the ocean's carrying capacity are being – or, in some cases, have been – reached (Irnniss and Simcock, 2016). Emerging activities, such as deep seabed mining, present a new potential pressure of unknown scale, risk, and effects on marine ecosystems (Gollner et al., 2017; Jones et al., 2017; Van Dover et al., 2017; Niner et al., 2018; Drazen et al., 2020; Smith et al., 2020b), adding to the prevailing mix of threats to biodiversity (O'Leary et al., 2020), including climate change effects (Levin and Le Bris, 2015; Sweetman et al., 2017; Levin et al., 2020b). An ecologically intact and well-managed ocean in turn has a key role in progressing towards the climate and sustainable development goals (Hoegh-Guldberg et al., 2019).

The interconnected nature of the ocean and the need to consider the problems of the shared ocean space as a whole are reflected in the Preamble of the United Nations Convention on the Law of the Sea (UNCLOS). UNCLOS lays the basis for the current ocean governance framework, establishing States rights, obligations, responsibilities, and competencies, and delimitating maritime boundaries, including two distinct legal regimes for marine areas beyond the limits of jurisdiction (ABNJ), the High

Seas and the Area.<sup>1</sup> On the one hand, the High Seas regime allows actors to freely engage in legitimate activities, such as shipping, navigation, marine scientific research, and fisheries as well as the laying of submarine cables, as long as certain obligations and requirements are met (see Part VII of UNCLOS). On the other hand, the Area regime in relation to the exploration or exploitation of the seafloor mineral resources falls within the remit of the International Seabed Authority (ISA), which is mandated to administer these resources as a common heritage and for the benefit of mankind as a whole (see Part XI of UNCLOS).

Because these activities are still expanding and regulated sectorally (Kim and van Asselt, 2016; Jouffray et al., 2020) environmental governance in ABNJ lacks a coherent and holistic governance based on precaution and knowledge-based decisions (Mahon et al., 2015; Gjerde et al., 2019). At present, competent management organisations in ABNJ, such as the International Seabed Authority (ISA), the International Maritime Organisation (IMO) or regional fisheries management organisations (RFMOs), have their own remit and responsibilities, acting mostly autonomously (Freestone et al., 2014), which hinders effective inter-organisational cooperation (Matz-Lück and Fuchs, 2014; Gjerde et al., 2019; Wright et al., 2019) and integrated management (Stephenson et al., 2019).

A transformative shift is needed from managing human activities in ABNJ through insulated sectoral governance approaches<sup>2</sup> in various legal contexts to an integrated and coherent global governance approach that accounts for planetary boundaries (Mace et al., 2014; Steffen et al., 2015; Nash et al., 2017; Lenton et al., 2019). This requires operationalising an ecosystem approach to the management (EAM) of human activities, which has been identified as a best-practice (UN General Assembly, 2019). EAM acts as a holistic governance framework based on principles as adopted by the parties of the Convention on Biological Diversity, CBD (Kirk, 2015; Gelcich et al., 2018), for tailor-made operationalization to the specific context (Convention on Biological Diversity, 2000). The overarching objective of ecosystem approaches, as observed by the UN General

**Abbreviations:** ABNJ, Areas Beyond the limits of National Jurisdiction; ABMT, Area-based Management Tool; BBNJ, Biodiversity Beyond National Jurisdiction; CBD, Convention on Biological Diversity; CCZ, Clarion-Clipperton Zone; EAM, Ecosystem approach to the management of human activities, used here to include ecosystem-based management; EIA, Environmental Impact Assessment; GES, Good Environmental Status; IGC, Intergovernmental Conference; ISA, International Seabed Authority; MPA, Marine Protected Area; MSP, Marine Spatial Planning; REM-P, Regional Environmental Management Plan; RFMO, Regional Fisheries Management Organisation; SEA, Strategic Environmental Assessment; SDG, Sustainable Development Goal; UNCLOS, United Nations Convention on the Law of the Sea; UNGA, United Nations General Assembly; VME, Vulnerable Marine Ecosystem.

<sup>1</sup>See e.g. analysis of Freestone (2015). Explanation of terms in supplementary materials (1).

<sup>2</sup>A sectoral-based approach typically focuses on meeting its own interests and addressing the direct harm resulting from within the sector, while tending to neglect possibly interacting impacts or pressures from other activities (i.e. outside the sector), as well as climate change.

Assembly, ‘should be focused on managing human activities in order to maintain and, where needed, restore ecosystem health’.<sup>3</sup>

Although the legal regimes of the Area and the High Seas present different functions and objectives, both recognize the importance of protecting and conserving natural resources and ecosystems in ABNJ that are ecologically closely interconnected. To achieve a comprehensive and effective integrated management to tackle the systemic nature of the problems, consistency across legal regimes is needed (Markus and Singh, 2016). A common set of overarching goals and objectives to ensure the ecological integrity of ocean ecosystems (Kim and Bosselmann, 2015; Kim and van Asselt, 2016) may be implemented through mechanisms which require the synergistic interaction between the various actors (De Santo et al., 2019; Tang et al., 2021), eventually enhanced through a platform for exchange (Gjerde et al., 2019). Such mechanisms could be designed under the emerging internationally legally binding instrument (referred to as the proposed ‘BBNJ’ Instrument) under the auspices of the United Nations for the conservation and sustainable use of marine biodiversity from the surface to the seafloor in areas beyond national jurisdiction.

In parallel, the ISA has been in the process of developing Regional Environmental Management Plans (REMPs) – a mechanism defined by the ISA as ‘a proactive area-based management tool to support informed decision-making that balances resource development with conservation’ (International Seabed Authority, 2018b) – for regions with current or emerging mining interests. The concurrency of negotiations presents a window of opportunity for enhancing integrated environmental governance.

In this article, we elaborate on options for stronger governance integration and the development of a coherent and collaborative interplay between these two processes. To this end, we explore the potential of Regional Environmental Management Plans (REMPs) established by the ISA as a case study to contribute to global biodiversity conservation, and the opportunity for the proposed BBNJ Instrument to promote overarching coherence to biodiversity conservation in ABNJ premised on EAM. We conclude that the proposed BBNJ Instrument could play a pivotal role to streamline multilateral action for the conservation of biodiversity in ABNJ by adopting an ambitious, overarching environmental vision and strategic goals, accompanied by strong implementation and enforcement mechanisms, which, in turn, could inform and guide the REMP development process at the ISA (as well as other measures and efforts pursued by other sectoral organisations that operate in ABNJ). In this respect, this paper does not aim to suggest a set of specific mechanisms through which ABNJ can be better governed, but rather looks at REMPs as a case study to learn how the governance in ABNJ could be more coherently linked to ensure comprehensive ocean protection and sustainable use.

<sup>3</sup> UNGA Resolution 61/222 on Oceans and the Law of the Sea (20 December 2006), para. 119(b); Resolution 62/215 (22 December 2007), para. 99(b); Resolution 63/111 (5 December 2008), para. 117(b).

## 2 AN ECOSYSTEM APPROACH TO MANAGEMENT FOR ABNJ

The purpose of an EAM is to balance conservation, sustainable use, and fair and equitable sharing of benefits, including with future generations, provided by the use of natural goods and services (Secretariat of the Convention on Biological Diversity, 2004) with a focus on managing human activities to maintain and, where needed, restore ecosystem health. To achieve this change in perspective is required from individual sectoral impacts to an integrated and systemic management perspective to enable the transition to global sustainability (Costanza et al., 1998; Rockström et al., 2009; Liu et al., 2015; EEA, 2019; Independent Group of Scientists appointed by the Secretary-General, 2019).

The CBD Secretariat states that ‘There is no single way to implement the ecosystem approach (...). Indeed, there are many ways in which ecosystem approaches may be used as the framework for delivering objectives of the Convention in practice’ (Convention on Biological Diversity, 2000). In practice, EAM implementation has proven to be challenging, e.g. in national context due to insufficient financial resources, insufficient scientific information, institutional fragmentation and conflicts, lack of incentives and inadequate mandates (Macpherson et al., 2021). At the international level, the variation in terminology and differences between narratives, as well as the existence of diverging values and objectives among jurisdictions and agencies, are obstacles related to the approach (De Lucia, 2015; Rudd et al., 2018).

The philosophy of EAM, as well as its instruments for operationalization, provide the basis for more ambitious, coordinated, holistic and transboundary governance of interrelated areas of the ocean that are politically divided, such as the High Seas and the Area in ABNJ (Gjerde and Wright, 2019; Jaeckel, 2020b; Tunnicliffe et al., 2020; Warner, 2020). Therefore, operationalising EAM is a necessity for ABNJ as raised very early on in the multilateral BBNJ discussions (De Lucia, 2019). In the current draft text of the proposed BBNJ Instrument<sup>4</sup>, the ecosystem approach is one of several general guiding approaches required for its implementation and is also explicitly considered for the identification, review and monitoring of areas that require protection (BBNJ November 2019 Draft Text, arts. 5.f, 16.1, and 21.4). However, the current draft text of the proposed BBNJ Instrument does not provide more information with regard to how EAM could be operationalised.

The same vagueness applies to the ISA, which is responsible for the development of a set of regulations that would govern the future exploitation of mineral resources in the Area. In its current draft of the exploitation regulations, the ISA commits to implementing EAM as one of its governance principles (International Seabed Authority, 2019b, Part IV). Other than that, however, the ISA does not expressly recognise EAM as the best management practice at hand to cope with the multiple and

<sup>4</sup> The draft text will be updated by the president of the IGC ahead of the IGC 5 meeting, tentatively planned for August 2022.

interrelated spatial and temporal environmental effects to be caused by mining (Guilhon et al., 2020). Although some elements of EAM can be traced in ISA documents that feature within its Mining Code and in the ISA's regional environmental management plan for the Clarion-Clipperton Zone (International Seabed Authority, 2011; International Seabed Authority, 2012), which is to be '*consistent with the principles of integrated ecosystem-based management*', no practical steps have been taken to implement or address EAM throughout the ISA regulations or recommendations (Guilhon et al., 2020).

In order to recognize the implications of an EAM for practical management, it is important to understand the general premises of the approach and how it contrasts with traditional sectoral approaches. For this purpose, it will be useful to rely on key principles or elements that are typically associated with the definition of EAM as identified by Long et al. (2015) (highlighted in bold throughout the text). While the latter focus on reducing/minimising environmental impacts through measures at the source, usually after the demonstration of unacceptable effects, EAM is a comprehensive, cross-sectoral approach which implements the **precautionary approach** throughout, based on agreed **long-term vision, strategic goals and management objectives**. EAM has the complexities of the ecosystems affected by human activities in view and therefore acts on **best available information from all sources (use of scientific and other types of knowledge)**, while acknowledging the existence of uncertainties. In line with EAM, the collection of data should **account for natural dynamics and connectivity i.e.**, on the structure and function of the respective ecosystems, as well as all economic and other pressures, including climate change (consideration of **cumulative impacts and effects on adjacent ecosystems**), acting on **various temporal and spatial scales**. A core management element is a transparent, inclusive and comprehensive assessment on baseline conditions, as well as of pressures and effects on the ecosystems in question prior to decision-making on policies, plans and programmes, e.g. through Strategic Environmental Assessment (SEA). Other key elements are the distillation of complex ecosystem information into digestible ecosystem state and development indicators; the establishment of reference levels on which management decisions can be made; and clear protocols to **evaluate tradeoffs** (Link and Browman, 2017). Based on the results from an **appropriate monitoring strategy**, an **adaptive management cycle** includes a periodic review of the environmental situation and of the suite of measures. **Transparency and stakeholder involvement** are important process standards for EAM governance (Cormier et al., 2017; Cormier, 2019). Collaborative and coordinated approaches, **integrated** and across sectors, will likely be more effective to attain the interrelated ocean, biodiversity, and climate targets (Stephenson et al., 2019). In consonance with EAM, decisions taken should **reflect societal choice**.

Despite the range of options around EAM definition and operationalization all over the world, common elements of EAM have been identified and used to identify gaps and recommend opportunities for improvement (Guilhon et al., 2020;

Xavier et al., 2022). In the following, we juxtapose REMP and the provisions of the proposed BBNJ Instrument in context with some elements (principles)<sup>5</sup> (identified by Long et al. (2015) and subsequently relied upon by Guilhon et al. (2020) in the context of deep seabed mining) as an exercise to discuss challenges and opportunities for enhancing EAM in ABNJ. The pathways taken to discuss EAM throughout the text was drawn from the authors' knowledge and experience on the ISA and BBNJ regimes, as well as from the literature.

### 3 ENVIRONMENTAL GOVERNANCE OF DEEP SEABED MINING IN THE AREA AND THE ESTABLISHMENT OF REGIONAL ENVIRONMENTAL MANAGEMENT PLANS

This section provides an overview of the environmental governance of deep seabed mining in the Area, including the establishment of Regional Environmental Management Plans. In the light of increasing activities taking place in ABNJ and the inherent environmental risks linked to mining activities in the Area, this section underscores the great potential of REMP in contributing towards an integrated and ecosystem-based management and discusses current limitations concerning the development and implementation process of REMP under the ISA.

#### 3.1 Environmental Governance of Deep Seabed Mining in the Area

The International Seabed Authority, ISA, is an international organisation made up of 167 member States and the EU, which was established through UNCLOS in 1994. Through the ISA, States collectively determine the access to the mineral resources of the Area and any activities in connection with mineral exploration and commercial exploitation that will take place there. Rules, regulations, and procedures therefore apply only to such activities, but the related environmental effects will extend to both the seafloor and the water column. The obligation '*to ensure effective protection for the marine environment from harmful effects which may arise from such activities*' (UNCLOS Art. 145) is therefore a critical one, given the deleterious effects that mining activities could cause to the marine environment, especially once they take place at large, commercial scales for decades to come.

Since the 1970s, multiple mineral exploration operations have been underway in all ocean basins both within and beyond national jurisdiction, some accompanied by scientific disturbance experiments (Okamoto, 2005; Jones et al., 2017; Sparenberg, 2019). No experience exists to date with mining

<sup>5</sup>These EAM elements (principles) broadly reflect the principles set out by CBD (2000) COP 5 Decision V/6, however are informed by an extensive literature search, covering academic, government and NGO sources.

mineral substrates in the deep-sea on a commercially relevant scale, which makes it difficult to estimate the potential impacts of multiple operations over time and space. Therefore, there are considerable knowledge gaps regarding the possible long-term and deleterious effects of deep seabed mining on deep-sea and open ocean ecosystems which may threaten crucial ecosystem functions and services, including provisioning services (e.g. fish, genetic resources), regulating services (carbon cycle), or cultural services (science and discovery) (Le et al., 2017). Not only do we lack an understanding of the mining-induced consequences of biodiversity loss (Van Dover et al., 2017; Niner et al., 2018), loss of unique habitats, such as hydrothermal vents (Van Dover, 2011; Van Dover, 2014; Van Dover et al., 2018), and loss of irreplaceable seamount fauna (Schlacher et al., 2013; Morgan et al., 2015; Gollner et al., 2017; Clark et al., 2019), but also the procedures needed to gain knowledge on such consequences have not yet been established (Ginzky et al., 2020). This is in stark contradiction to the global goal set by the international community to halt the loss of biodiversity, ‘*end the war on nature*’<sup>6</sup> and ‘*live in harmony with nature*’.<sup>7</sup> Concerns are growing as to whether deep seabed mining in the Area at any scale could be environmentally responsible (Beaulieu et al., 2017; Kim, 2017; Van Dover et al., 2017; Niner et al., 2018; Mickelson, 2019; Levin et al., 2020a; Smith et al., 2020b). Small-scale experiments suggest also that mining will lead to the long-term reduction of carbon cycling and deposition in the affected benthic food-web (Stratmann et al., 2018; Sweetman et al., 2018; de Jonge et al., 2020), effectively reducing the ocean’s carbon storage capacities to an as yet unknown degree.

Despite these risks and uncertainties, the ISA is progressing with mineral exploration contracting,<sup>8</sup> and moving towards finalizing the legislative framework for enabling future mineral exploitation, ongoing since 2014.<sup>9</sup> The so-called Mining Code, to be adopted before decisions can be made on the first applications for exploitation activities, comprises rules, regulations and procedures framing the contract conditions for potential miners: a) the (eventually resource-specific) exploitation regulations to set the broad binding framework for contractors and procedures to be followed by ISA; b) binding standards and non-binding guidelines on among others environmental issues.<sup>10</sup> The ISA also has to enforce contractor compliance (Komaki and Fluharty, 2020), including to establish a body of inspectors for this purpose.

The ISA appears to be a weak regulator (Ginzky et al., 2020) in the latest draft exploitation regulations (International Seabed Authority, 2019b) which provide only a very general framework for environmentally relevant procedures, such as the obligation for applicants to submit an Environmental Impact Statement (EIS) to document and report the results of the environmental impact assessment process (EIA process), and an Environmental Management and Monitoring Plan. Normative standards for implementing effective environmental protection and mitigation measures in line with the obligations set by UNCLOS Articles 145 and 192 do not yet exist, and scientists are concerned that misconceptions about the implications of scientific uncertainties on the nature of the deep-sea environment and related scientific advice on the potential mining-related effects may unjustifiably increase the acceptability of mining (Smith et al., 2020a; Smith et al., 2020b). However, even though the Council of the ISA ultimately would decide on whether or not to approve a plan of work, the powers for the ISA to reject an application based on an insufficient EIS as yet not well defined, nor is there any indication of considering mining applications regionally for their cumulative impacts *vis à vis* sustainability or in view of an overall cost-benefit accounting.

### 3.2 Regional Environmental Management Plans

In the late 2000s, the scientific community raised an alarm over the cumulative impacts expected from multiple mining operations and proposed a regional representative network of mining exclusion zones (Wedding et al., 2013; Wedding et al., 2015). This led to the development of a first regional environmental management plan (REMP) for the CCZ in the Northeast Pacific (International Seabed Authority, 2011; International Seabed Authority, 2012), based on a set of guiding principles (incl. the precautionary approach, protection and preservation of the marine environment, prior impact assessments and transparency), a vision, as well as goals and objectives which include ‘*to facilitate mining while minimizing as far as practically possible the impact of seabed mining activities, and preserving and conserving marine biodiversity and ecosystem structure and function*’. In addition, it is worth highlighting that the CCZ-REMP include among its goals ‘*to manage the Clarion-Clipperton Zone consistent with the principles of integrated ecosystem-based management*’ [International Seabed Authority, 2011, para. 35 (d)]. Further, the plan includes a network of originally nine large, temporary exclusion zones outside the existing contract areas for polymetallic nodule exploration.<sup>11</sup>

Encouraged by the United Nations General Assembly Resolution 68/70 adopted in 2013, and again with important impetus of the scientific community (Van Dover et al., 2012; Dunn et al., 2018), the ISA has also been progressing the development of REMPs on the Mid-Atlantic ridge in the North Atlantic,<sup>12</sup> and in the Western Pacific near the US Mariana

<sup>6</sup> A. Guterres ‘State of the Planet’, <https://www.bbc.com/news/science-environment-55147647>.

<sup>7</sup> 2050 Vision of the CBD Post-2020 Global Biodiversity Framework, see: <https://www.cbd.int/decision/cop/?id=12268>.

<sup>8</sup> See <https://www.isa.org.jm/exploration-contracts>: As of 2021, 31 exploration contracts with 22 contractors exist for three types of mineral-rich substrates (polymetallic nodules, seafloor massive sulphides and cobalt-rich ferromanganese crusts) in all ocean basins.

<sup>9</sup> <https://www.isa.org.jm/mining-code/ongoing-development-regulations-exploitation-mineral-resources-area>. For an overview of possible policy instruments and incentives which help the dual goal of ‘promoting DSM while also protecting the environment’ see Lodge et al. (2019).

<sup>10</sup> See <https://isa.org.jm/mining-code/standards-and-guidelines>. At present, the proposed standards do not exceed the broad requirements of the draft regulations; guidelines are of procedural nature.

<sup>11</sup> See further under 4.2.3.

<sup>12</sup> <https://www.isa.org.jm/workshop/workshop-regional-environmental-management-plan-area-northern-mid-atlantic-ridge>

Trench National Monument and the Exclusive Economic Zones of the United States, Japan, the Marshall Islands and Micronesia.<sup>13</sup> In addition, preparations are ongoing for REMPs covering existing and potential contract areas in the Indian Ocean as well as the South Atlantic (ISBA/26/LTC/2, summarising the REMP activities of the ISA since 2012).<sup>14</sup>

REMPs are to date a non-binding policy instrument,<sup>15</sup> defined as ‘a proactive area-based management tool to support informed decision-making that balances resource development with conservation’ and which help the ISA to meet its international conservation commitments, such as Aichi Biodiversity Target 11, by providing mechanisms for the identification and protection of ecologically representative subareas (International Seabed Authority, 2018b). Further, they are considered a tool for addressing the cumulative impacts of deep-seabed mining in those regions where exploration contracts have been issued (Lodge et al., 2014). The ISA policy reflects these ambitions in its high-level strategy, among others, to ‘Develop, implement and keep under review regional environmental assessments and management plans for all minerals provinces in the Area where exploration is taking place to ensure sufficient protection of the marine environment as required by, inter alia, article 145 and Part XII of the Convention’ (Strategic Direction 3.2, International Seabed Authority, 2018a; International Seabed Authority, 2020, underlined part missing in International Seabed Authority, 2020). Despite the high-level commitment to REMPs, there is still a need to tie them to the ISA decision-making framework (Jaeckel, 2016) and to give legal effect to the ways how REMPs shall be established and implemented across the Area. Here, a ISA environmental strategy could be instrumental in determining roles, responsibilities, procedures, as well as common criteria to be applied to all regional environmental assessments, and enabling the ISA’s dedicated technical expert body, the Legal and Technical Commission (LTC) itself to ‘prepare assessments of the environmental implications of activities in the Area’ [UNCLOS article 165(2) (d)] (Jaeckel, 2020b).

### 3.3 An Ecosystem Approach for Developing and Managing REMPs

Potentially, a regional management approach such as envisaged by the ISA provides tremendous opportunities for an EAM-consistent regionally integrated environmental governance in ABNJ, even if only pursued by one sectoral organisation (Christiansen and Singh, 2022 in press). Cormier (2019) distinguishes the ecosystem approach a) to governance, acting through policy making, b) to management, through protection and conservation objectives, and c) the operational ecosystem approach which delivers the operational control of activities and therefore the effective outcome of the governance regime. All three are important in

context with developing and managing REMPs, in particular if a tiered approach connects the project-level contracting with the global ISA policy (Jones et al., 2019; Jaeckel, 2020b).

An EAM-based REMP would have several general traits derived from the principles identified by (Long et al., 2015). Below, we discuss such traits that are important for integrated biodiversity conservation and management in ABNJ.

#### 3.3.1 Long-Term Environmental Vision, Strategic Goals and Objectives

An important aspect of a EAM-based REMP is the ambition to manage deep seabed mining activities transparently towards pre-agreed **long-term environmental quality goals and objectives** broken down from the ISA’s environmental mandate to ‘*ensure effective protection for the marine environment from harmful effects which may arise*’ from activities in the Area (UNCLOS Art. 145) such as to prevent, reduce and control pollution and other hazards, and prevent damage to the flora and fauna and interference with the ecological balance (Tunncliffe et al., 2020). Such goal setting is to some extent value-based and therefore needs to be **stakeholder-inclusive** (Jaeckel, 2017b). Therefore, in a region, it has to be decided how to break down the high-level global biodiversity conservation goals and commitments into measurable and achievable regional objectives and targets<sup>16</sup> based on the regional environmental status and **cumulative pressures**. Any thresholds set and measures agreed in the REMP have to help achieve the desired outcome, and a periodic assessment of how the environmental status changes (in direction of the goals or away from it) should lead to a review of the REMP measures (e.g. **Figure 1**, Jaeckel, 2017a; Jaeckel, 2017b).

##### 3.3.1.1 Current Status

The environmental management plan for the Clarion Clipperton Zone (CCZ EMP, International Seabed Authority, 2011; International Seabed Authority, 2012) includes a vision, goals, strategic aims and operational and management objectives for the entire region, contract areas and the areas of particular environmental interest, APEIs, which are exempt from mining. However, its vision is focussed on the enabling of mining (sustainable exploitation, facilitate mining, holistic approach to regional management, paras. 32-34, respectively) rather than to ‘*ensure effective protection for the marine environment from harmful effects which may arise from*’ activities in the Area, as defined in the ISA mandate in Article 145 UNCLOS. While again directed to exploitation [para. 35(a)], the CCZ EMP goals also make reference to the goals and targets set out in the Plan of Implementation of the World Summit on Sustainable Development [para. 35(b), WSSD, 2002], including ‘to halt the loss of biodiversity’ and ‘to establish ecosystem approaches to management’. Further the goals include to ‘*maintain regional biodiversity, ecosystem structure and ecosystem function across*

<sup>13</sup> <https://www.isa.org.jm/workshop/workshop-regional-environmental-management-plan-area-northwest-pacific>

<sup>14</sup> See [https://isa.org.jm/files/files/documents/isba\\_26\\_ltc\\_2-e.pdf](https://isa.org.jm/files/files/documents/isba_26_ltc_2-e.pdf)

<sup>15</sup> See ISBA/25/C/4. There is ongoing debate on whether and how to make REMPs binding. For example, Germany submitted proposals to link the requirements set out in the draft regulations with the respective REMP ([ISBA/25/C/29, [https://isa.org.jm/files/files/documents/isba25\\_c29-e\\_0.pdf](https://isa.org.jm/files/files/documents/isba25_c29-e_0.pdf)]).

<sup>16</sup> Should preferably be SMART: Specific-Measurable-Achievable-Relevant-Time-bound. See e.g. ICES (2005).

the *Clarion-Clipperton Zone*' [para. 35(c)], but only to 'enable the preservation of representative and unique marine ecosystems' [para. 35(e)].

At present, the ISA Strategic Plan 2019-2023 (International Seabed Authority, 2018a) while only partially reflecting the principles set out in the CCZ EMP, clearly acknowledges the extensive environmental protection mandate of UNCLOS as well as the goals of the 2030 Agenda (UN General Assembly, 2015), the Aichi Biodiversity targets (Convention on Biological Diversity, 2010), transparent and inclusive processes such as collaborative regional assessments and management plans (ISBA/24/A/10 Annex para.14). However, overarching environmental goals, objectives and measurable targets, though stressed by the ISA Council in 2018<sup>17</sup> are as yet missing (Jaeckel, 2020b).

### 3.3.2 Stakeholder Values and Conflicting Uses of the Marine Environment

For an EAM-based REMP it is fundamental (Langlet and Rayfuse, 2018) that there is **stakeholder involvement** early on and all of the process and results are made public. Using a SEA-type procedure for the knowledge generation and assessment of *i.e.* the environmental state, pressures and threats for developing measures in the regions identified for developing REMP will be helpful to make REMP development **transparent** and accountable, as SEA ideally investigates the policy/plan/programme together with stakeholders while it is still under development and can be adjusted.

Early involvement of all those who may directly or indirectly be affected by the effects of mining operations in the Area is crucial, as the mining activities endorsed by the ISA will add to an existing mix of ocean uses in ABNJ, including open ocean and deep water fishing, shipping, cable laying, and marine scientific research (Jouffray et al., 2020). User conflicts could arise through direct competition for space with other uses, such as with shipping, cable-laying, fishing and research (International Seabed Authority, 2019a), and with designated areas for conservation (Convention on Biological Diversity, 2014a; Johnson, 2019). Indeed, not only have the interests of the cable-laying industry been overlooked when contracting (International Seabed Authority, 2019a; Rayfuse, 2020), studies have also shown that fisheries could be impacted by mining activities in the Area (van der Grint and Drazen, 2021),<sup>18</sup> and thus RFMOs and other stakeholders should actively participate in the work of the ISA, including REMP development, to ensure that their interests are protected.<sup>19</sup>

<sup>17</sup>ISA, Statement by the President of the Council on the work of the Council during the second part of the twenty-fourth session - Addendum, ISBA/24/C/8/Add.1, 25 July 2018. [https://www.isa.org.jm/sites/default/files/files/documents/isba24c-8add1-en\\_0.pdf](https://www.isa.org.jm/sites/default/files/files/documents/isba24c-8add1-en_0.pdf).

<sup>18</sup><https://pasifika.news/2021/09/scientists-call-for-moratorium-on-ocean-mining-fearing-impact-on-pacific-tuna-fishery/>

<sup>19</sup>See e.g. opinion of European LDAC 2019, [https://ldac.eu/images/EN\\_LDAC\\_Advice\\_on\\_Deepsea\\_Mining\\_R.04.19.WG5\\_May2019.pdf](https://ldac.eu/images/EN_LDAC_Advice_on_Deepsea_Mining_R.04.19.WG5_May2019.pdf), and Joint LDAC-Pelagic-NWWAC Advice Deepsea mining in international waters, 2021, [https://ldac.eu/images/EN\\_Joint\\_LDAC\\_PELAC\\_NWWAC\\_Advice\\_Deepsea\\_Mining\\_Nov2021.pdf](https://ldac.eu/images/EN_Joint_LDAC_PELAC_NWWAC_Advice_Deepsea_Mining_Nov2021.pdf), <https://ldac.eu/en/publications/947-joint-ldac-pelac-nwwac-advice-on-deepsea-mining-in-international-waters>.

In addition to conflicts through competition for space, the deterioration of environmental quality may impair the opportunities of other users, e.g., fishing, or prospecting for marine genetic resources,<sup>20</sup> and which could also impact national waters and coastal communities (Dunn et al., 2017; Popova et al., 2019). Although beyond national jurisdiction, the potential mine sites in the Area and overlying High Seas are geographically by no means far from shore everywhere. For example, the CCZ and its multiple exploration contract areas border the Exclusive Economic Zones of Mexico, the US and Kiribati. In the Indian Ocean, the contracted mid-ocean ridge areas are immediately outside the waters of Seychelles, Mauritius, and the Chagos Archipelago. Here, the monsoon winds result in a tight connection between High Seas waters and African coastal waters (Popova et al., 2019). Popova et al. (2019) also demonstrate that, often unrelated to geographic distance, coastal regions are **connected** to ABNJ through notably larval dispersal and the potential dispersal of pollutants.

There may also be conflicting **goals**. In many ocean regions, regional seas conventions and RFMOs seek to improve the environmental status in waters under national jurisdiction and in some cases including ABNJ. For example, OSPAR and North-East Atlantic Fisheries Convention (NEAFC) have established networks of marine protected areas (MPAs) and bottom fishing closures, respectively, in ABNJ in the North-East Atlantic since 2010 (O'Leary et al., 2012) and are seeking cross-sectoral practical implementation of the MPA's conservation objectives through a so-called '*Collective Arrangement Between Competent International Organizations on Cooperation and Coordination Regarding Selected Area in Areas Beyond National Jurisdiction in the North East Atlantic*', formalised in 2014.<sup>21</sup> Until today OSPAR and NEAFC are the only active partners (Rayfuse, 2020; Tang et al., 2021). Such MPAs and bottom fishing closures are however only binding on the respective contracting parties.

#### 3.3.2.1 Current Status

The current level of interest of other sectoral organisations in participating in the REMP development seems limited, highlighting the current limitations of the sectoral approach. A further impediment relates to the fact that, to date, the rights and duties of the REMP managing organ and stakeholders are undefined and there is no agreed (and known) strategy for stakeholder engagement,<sup>22</sup> including a response mechanism to stakeholder comments and suggestions. The currently envisaged method of stakeholder participation in the development of REMP is limited to two region-specific technical workshops with limited capacity and unclear participation criteria. There is a risk that the perceived lack of systematic stakeholder mapping may lead to an imbalance of stakeholders represented at workshops. There is no continuous

<sup>20</sup>A recent example for the extremely high importance of preserving ecosystems and biodiversity for mankind was the test being used to diagnose the Covid-19 virus from marine genetic material derived from hydrothermal vents. <https://www.who.edu/news-insights/content/finding-answers-in-the-ocean/>

<sup>21</sup><https://www.ospar.org/news/collective-arrangement>

<sup>22</sup>A first draft by the ISA Secretariat was sent out for stakeholder comments in spring 2021, but no action since then. It focusses exclusively on public engagement and seeks to restrict opportunities for effective participation by ISA States and observers.

workstream foreseen to which stakeholders could provide input, commenting will only once be possible on the draft REMP document. Neither an overarching advisory panel for all regions, nor region-specific advisory committees are foreseen – such mechanisms could provide for a broader representation of stakeholder groups other than scientific experts.

### 3.3.3 Integration Through Comprehensive Environmental Assessments

While ISA only has the mandate to manage mining-related activities in the Area, these cannot be seen in isolation and their impacts must be assessed and managed in context with all other pressures in the region. Tiered strategic (SEA) or Regional Environmental Assessment (REA) processes are recommended for implementing such EAM-based REMP (Jones et al., 2019), because they come with a toolbox based on existing national (Government of Ireland, 2004) and regional experiences (European Commission, 2003; United Nations, 2003; OECD-DAC, 2006), as well as the Guidance of CBD for ABNJ (Convention on Biological Diversity, 2012). A state-of-the-art regional environmental report provides the basis for decision-making on measures as to be laid down in the regional environmental management plan. The environmental report should be synthesised from all available sources and includes **all available information** on environmental status, pressures and threats, eventually problems and user-conflicts as well as **uncertainties**. Based on the pre-agreed environmental goals, the risks and expected environmental effects of mining-related activities from one or more commercial mines are predicted. Taking account of alternative actions with respect to scale, intensity, frequency, technology change or no action option, the comprehensive assessment should result in measures necessary to provide for effective protection of the marine environment from harmful effects from mining.

#### 3.3.3.1 Current Status

The design of all ISA REMP to be established in the future is as yet uncertain, however there are as yet no indications that comprehensive assessment process will be included. In preparation of the Mid Atlantic Ridge EMP, a 'Regional Environmental Assessment, REA' report was compiled (Weaver et al., 2019), which provides a scientific overview of the region at large, including possible impacts from mining and broad cumulative impacts, but not considering existing protected areas, fisheries closures and EBSAs. The REA is a scientific exercise only with very limited information on the contract areas. Neither a risk assessment nor an assessment of the significance of the threats from mining are included, which also reflects the uncertainties of future mining operations. However, the *ad hoc* expert-involving phase prior to drafting the REMP is now over. In spring 2022, a LTC draft REMP has been opened for consultation.<sup>23</sup> It remains to be seen how the cumulative impact assessments envisaged in the ISA Secretariat's Guidance to REMP (International Seabed

Authority Secretariat, 2019), and the CCZ EMP (International Seabed Authority, 2011; International Seabed Authority, 2012) will be realised.

### 3.3.4 Precautionary Measures in Light of Uncertainties

The **precautionary approach** is at the heart of EAM and is a legally binding obligation on ISA, States and contractors (ITLOS, 2011). Its implementation requires effective and proportionate '*protective measures to be embedded in decision-making procedures and supported by institutional arrangements that facilitate risk assessment and risk management in line with the precautionary principle*' (Jaeckel, 2015; Jaeckel, 2017b). Therefore, such measures must not only be based on **best available knowledge** from all sources, taking account of **stakeholder** and **scientific** advice, but also account for the **uncertainties** prevailing in relation to the deep ocean in general (Amon et al., 2022), and the mining technologies employed in particular, which together determine the scale and gravity of impact to be expected on the deep-sea ecosystems. This should result in a stepwise process to fill identified knowledge gaps and lead to decisions which err on the side of precaution (Amon et al., 2022). Ideally, a management cycle allows for corrective action based on new knowledge and experience, for example by adapting environmental standards, thresholds or spatial measures (Jaeckel, 2016).

In the absence of detailed knowledge, a REMP could encompass spatial and activity-based measures based on the unique characteristics of the particular environment in question, including for example to exempt all active hydrothermal vent fields from mining activities (Gollner et al., 2021), the designation of representative no-mining zones (Dunn et al., 2018), the adoption of a staged approach to mining (Niner et al., 2018; Craik, 2020; Smith et al., 2020b), and limiting the number of contracts/mine sites at any one time to control the extent of environmental impacts and preserve mine sites for future generations (Jaeckel et al., 2017). In the following, precautionary spatial measures in the context of REMP will be discussed by examining two specific themes: the designation of Areas of Particular Environmental Interest (APEIs) and respect for protective measures established in ABNJ by other bodies.

#### 3.3.4.1 Areas of Particular Environmental Interest

In the above-mentioned REMP for the Clarion-Clipperton Zone (International Seabed Authority, 2011; International Seabed Authority, 2012), the only visible and widely acknowledged precautionary management measure has been the designation of nine sites of 400x400 km each, known as 'Areas of Particular Environmental Interest'. The purpose of APEIs is to provide a safeguard for maintaining key ecological processes once commercial mineral extraction will take place in the region. Although APEIs are currently not subjected to exploration or exploitation activities, these are not permanently protected areas. Consequently, it is not unforeseeable that some of such sites may be opened to mining activities in future.

#### 3.3.4.2 Current Status

In the CCZ, APEIs were originally selected to be biogeographically broadly representative of the region, but had

<sup>23</sup> <https://isa.org/jm/news/draft-regional-environmental-management-plan-northern-mid-atlantic-ridge-open-consultation>

to be relocated to outside of the main manganese nodule belt (where the densest occurrences of nodules are), so as not to interfere with actual or potential exploration contract areas (Wedding et al., 2013; Wedding et al., 2015), are therefore not representative of the future mine sites and have limited similarity to the nearest contract areas (McQuaid et al., 2020; Jones et al., 2021; Washburn et al., 2021). Some of the gaps of the prior suite of sites were filled in December 2021, when four new APEIs outside contracted areas have been adopted by the ISA Council, although not providing the same buffer zones.<sup>24</sup> Other operational and scientific uncertainties concern e.g. the underlying assumption on sediment plume dispersal, population propagation and exchange, as well as the minimum size for an independent, unaffected reserve area (Cormier, 2019).

In the case of the northern Mid-Atlantic ridge REMP, a science-based mechanism for selecting a large scale, representative set of APEIs, proposed by Dunn et al. (2018), was not taken into consideration. Instead, new protection categories were created covering known active hydrothermal vent fields (*'sites in need of protection'*), hadal fracture zones (*'areas in need of protection'*), inferred vent sites and predicted cold-water coral habitat (*'sites/areas in need of precaution'*), which replace rather than complement the broad spatial protection of representative features with conservation of small-scale knowledge-based evidence of vulnerable marine ecosystems (VMEs), the so-called 'fine filter' approach (Gollner et al., 2021; International Seabed Authority, 2021).<sup>25</sup> No details are known of the other two REMPs under development in the Indian and western Pacific Ocean (see above). However, the development of both will be facilitated by exploration contractors from India and China, respectively, which may indicate a conflict of interest.

### 3.3.4.3 Respect Spatial Designations in ABNJ by Other Bodies

Some precautionary measures do exist which apply to living resources and ecosystems in ABNJ globally. For example, hydrothermal vent fields and seamount ecosystems, which are also targeted for mining the seafloor massive sulfide (SMS) deposits and cobalt-rich crust, respectively, have been identified as potentially Vulnerable Marine Ecosystems (VMEs) by the UN General Assembly (among others), which are to be protected from significant adverse impacts from deep-water fishing beyond and partly within national jurisdiction (UNGA 2006; FAO, 2009; Van Dover et al., 2018). While these resolutions and guidelines are not legally binding, their implementation in national laws and regional bodies (e.g. within the EU and several RFMOs) reflect a widespread consensus on their need for protection from a wide range of actors globally (FAO, 2016) in line with an agreed set of criteria

and precautionary measures. A similar set of criteria has been agreed by the parties of the CBD to identify Ecologically or Biologically Significant Marine Areas (EBSAs), an also non-binding precautionary spatial designation in ABNJ (Secretariat of the Convention on Biological Diversity, 2009; Convention on Biological Diversity, 2014a).<sup>26</sup> Although these EBSAs have no formal protective status, their purpose is to inform the future development of MPAs in ABNJ.

### 3.3.4.4 Current Status

Several of the broadly identified ISA REMP regions include or neighbour EBSAs or other types of area-based measures. As an example, we highlight the ISA exploration contract areas on the northern Mid-Atlantic Ridge, which give rise to concern that mineral exploration and later exploitation will entail a risk of significant adverse impacts for the ecosystems associated with the active and inactive hydrothermal vent fields, which have all been designated as EBSA (Convention on Biological Diversity, 2014a; Convention on Biological Diversity, 2014b). A review by Gollner et al. (2021) highlights the uniqueness or rarity of these fields, their functional significance and fragility, as well as life-history traits that make recovery difficult. In addition, one site, the 'Lost City' hydrothermal vent field has been shortlisted as an '*outstanding universal value*' World heritage Site in 2016 (Johnson, 2019). Notwithstanding, in August 2017, a Plan of Work for exploration of polymetallic sulphides along the Mid-Atlantic Ridge south of the Azores presented by Poland was approved (ISBA/23/C/19/Rev.1), based on a recommendation of the ISA's LTC, which did not specify any particular environmental concerns (ISBA/23/C/11).

## 3.4 Steps to Enhance Coherence in ABNJ

For REMPs to be an effective instrument in control over mining-related impacts and cumulative environmental degradation and to prevent biodiversity loss, the plan would need to be established in a systematic, stakeholder-inclusive, holistic manner (Christiansen and Singh, 2022 in press). A more standardised approach to the development of REMPs under development in all ocean basins would foster coherence in ABNJ governance and with the global biodiversity agenda and support transparency and coordination. This could entail, for example: a) the scope and procedure of the REMPs; b) an agreed purpose, overall environmental goals and objectives, and principles; c) the regulatory framework for REMPs; d) the minimum requirements in the delivery of the management plan; and e) stakeholder engagement, participation and interaction with other management authorities in these regions (Christiansen

<sup>24</sup> See 2021 Review of the implementation of the Environmental Management Plan for the Clarion-Clipperton Zone ISBA/26/C/43; [https://isa.org.jm/files/files/documents/ISBA\\_26\\_C\\_43-2110787E.pdf](https://isa.org.jm/files/files/documents/ISBA_26_C_43-2110787E.pdf)

<sup>25</sup> See ISA workshop report at [https://isa.org.jm/files/files/documents/Final\\_Draft\\_workshop\\_report-nMAR\\_REMP.pdf](https://isa.org.jm/files/files/documents/Final_Draft_workshop_report-nMAR_REMP.pdf). The categories were pre-decided by ISA LTC and Secretariat, not based on scientific proposal. An LTC proposal for an Atlantic Ridge REMP is yet to be recommended to the Council for approval.

<sup>26</sup> <https://www.cbd.int/ebsa/>. The designation of EBSAs within and beyond national jurisdiction according to scientific criteria shall aid the implementation of the global goal to halt the loss/decline of biodiversity and is therefore the first step towards protecting these ocean areas. It precedes the option to designate legally binding spatial measures, as under negotiation in the frame of the proposed BBNJ Instrument. The website holds documentation on each EBSA.

<sup>27</sup> See ISBA/26/C/5 and ISBA/26/C/6 at <https://isa.org.jm/files/files/documents/isba-26c-6-en.pdf> and <https://isa.org.jm/files/files/documents/isba-26c-7-en.pdf>. In November 2021, there is as yet no response to the Council request to LTC for consideration dated February 2020.

and Singh, 2020; Christiansen and Singh, 2022 in press). In this respect, several Member States of the ISA have recognised the shortcomings in the current process and proposed ISA to adopt a standardised approach for processes, procedures and implementation of all REMPs (submission of Germany, The Netherlands and Costa Rica to the ISA Council 2020<sup>27</sup> following an international expert workshop held in Hamburg, Germany, in November 2019).<sup>28</sup> This includes a suggestion to establish independent, *ad-hoc* expert bodies to take charge of the REMP development process for each region, as well as to consider REMPs as being legally-binding as opposed to guidance tools (i.e. the ISA could reject mining applications if it is inconsistent with the relevant REMP). **Table 1**, in the **Supplementary Materials** (2) specifies in more detail the comparison between the current practice of REMP development and a design which would bring REMP establishment and processes in line with an ecosystem approach to management, EAM, in line with the submission made by Germany/The Netherlands/Costa Rica to the ISA Council 2020 (Christiansen and Singh, 2020; Christiansen and Singh, 2022 in press). Technically, the regional expert bodies would be best suited to prepare the groundwork to develop and maintain up-to-date draft REMPs, including organisation of the process, information gathering, stakeholder mapping, management and consultation, drafting, and ideally maintaining a clearing house mechanism. The regional expert bodies could ensure communication and integration of the different sectoral organisations directly, cooperate with existing regional frameworks, or where these do not exist, the REMP could serve as a platform for inter-sectoral cooperation and conflict resolution. The desired outcome is an integrated environmental management of a certain ocean region under shared responsibilities.

REMPs could and should contribute to a globally coherent and systematic biodiversity conservation planning in ABNJ, including through precautionary spatial protection measures. To achieve this it is suggested that ISA rules, regulations and procedures:

- a. Require applicants and contractors a) to report, map and publish any species and features in their (proposed) contract areas, which are or could be designated as VMEs, EBSAs, or MPAs; b) to assess the vulnerability of these features to mining-related impacts, in line with the criteria and methods for protecting hydrothermal vents and seamount ecosystems from the effects of bottom fishing to minerals mining; c) to identify potential conflicts with other users, values, and traditional owners; d) to detail any gaps in knowledge and uncertainties.
- b. Exclude features described as EBSAs and VMEs, as well as existing or planned MPAs, from the Plans of Work of ISA

contractors<sup>29</sup> (see also Van Dover et al., 2018; Johnson, 2019). This can best be achieved in a transparent and inclusive spatial planning process (Wright et al., 2019). As a minimum special reporting obligations should apply during exploration.

- c. Require ISA to maintain systematic and transparent communication processes with governance bodies, management authorities and stakeholders in the respective regions and contract areas, including a notification of adjacent coastal States and existing management and governance entities in the respective region of the intent to develop a REMP.<sup>30</sup>
- d. Establish a clearing house mechanism to provide for transparency, access to information and to establish communication pathways between science, stakeholders and policy, preferably compatible with the clearing house mechanism to be established under the proposed BBNJ Instrument.
- e. Design REMP development, monitoring and review to be based on SEA-like comprehensive assessments which could also inform regional governance in ABNJ.
- f. Make the REMP an effective instrument through measures applicable to all ISA contractors in the region which are guided by the precautionary approach and long-term environmental objectives, in line with the standards set out by the proposed BBNJ Instrument;
- g. Provide for adaptive management cycles for REMPs, including continuous monitoring and periodic assessment and review from the start.
- h. Design REMPs to provide for integration, consideration, and reconciliation of all relevant aspects of mining operations (economic, social and ecological), including a well-informed analysis of the benefits and (environmental) costs of mining.

If designed as a legally binding instrument, REMPs would allow the ISA to function as a proper regulator, *i.e.* through feedback of REMP **cumulative** environmental assessments on regional ISA contracting and the respective environmental standards for activities (Jaeckel, 2016), including Best Environmental Practice and the use of Best Available Technologies. The regional level may be best suited to set precautionary thresholds for 'effective protection', 'harmful effects' and 'serious harm', identify the appropriate indicators for a regional **monitoring** programme, and carry out the necessary environmental assessments that leads to an **integrated management** and embrace reviews in an **adaptive review** cycle. In addition to the suggestions above, directed at a ISA to produce more EAM-conform REMPs, the proposed BBNJ Instrument could eventually provide a critical impetus for integrating sectoral management tools such as the ISA REMPs, into the global biodiversity conservation agenda in ABNJ.

<sup>28</sup>See <https://www.umweltbundesamt.de/international-workshop-remphamburg-nov-2019>.

<sup>29</sup>Nodule Exploration Regs 31(4) requires 'The Commission shall develop and implement procedures for determining, ..., whether proposed exploration activities in the Area would have serious harmful effects on vulnerable marine ecosystems and ensure that, if it is determined that certain proposed exploration activities would have serious harmful effects on vulnerable marine ecosystems, those activities are managed to prevent such effects or not authorized to proceed.'

<sup>30</sup>Indicated by Mr. Michael Lodge, Secretary-General of the International Seabed Authority. Statement at the first negotiation session on the proposed BBNJ Instrument. New York, 07 September 2018. <https://isa.org.jm/files/documents/EN/SG-Stats/abmt-bbnj.pdf>

## 4 THE PROPOSED BBNJ INSTRUMENT AS AN OPPORTUNITY TO ENHANCE COHERENCE OF REMPS WITH ABNJ GOVERNANCE

In parallel to the ISA discussions on a deep sea mining regime, the negotiations on the proposed BBNJ Instrument, which build on over a decade of high level discussions at the United Nations, focus on four ‘package elements’ identified by States in 2011, namely: a) marine genetic resources (MGRs), including questions on the sharing of benefits; b) measures such as area-based management tools (ABMTs), including marine protected areas (MPAs); c) environmental impact assessments (EIAs); and d) capacity building and the transfer of marine technology (UN Resolution 72/249, para. 2), is ongoing. These four elements must be negotiated and considered ‘[ ... ] *in particular, together and as a whole* [ ... ]’ (UN Resolution 72/249, para. 2) and will be complemented by cross-cutting considerations on institutional arrangements, guiding principles and approaches, international cooperation, implementation, and compliance as well as the settlement of disputes. However, mechanisms to address biodiversity conservation as a systemic concern in ABNJ are not on the negotiation table today (De Santo et al., 2019). To date, four rounds of negotiations have taken place, with a fifth round of negotiations planned for August 2022. The latest draft text of the proposed BBNJ Instrument that serves as the basis for the discussion in this paper dates from November 2019.<sup>31</sup> Although parts of this draft text are in ‘square brackets’ and will likely change after the next negotiation round, it still allows in its current form to provide considerations for promoting and enhancing coherence and cross-sectoral collaboration in ABNJ premised on an ecosystem approach to management (EAM).

### 4.1 Current Reflection of EAM in the Draft BBNJ Instrument

The need for EAM was raised very early on in the multilateral BBNJ discussions (De Lucia, 2015). In the current draft text of the proposed BBNJ Instrument, the ecosystem approach is one of several general guiding approaches required for the implementation of the proposed BBNJ Instrument, and one that is also currently explicitly considered for the identification of marine areas that require protection as well as their review and monitoring (BBNJ November 2019 Draft Text, arts. 5.f, 16.1, and 21.4). Moreover, elements in consonance with EAM (Long et al., 2015) – adopting the polluters-pay principle, acting **precautionary**, adopting an **integrated approach**, using the **best knowledge** available (both scientific and traditional), considering the principle of **equity**, and adopting an approach built upon ecosystem **resilience and restoration** of ecosystem integrity – are also currently proposed as general guidance in the draft text of the proposed BBNJ Agreement (BBNJ November

2019, Draft Text, art.5). Strengthened cooperation between relevant instruments and organisations is also required in achieving the **overarching objective** of the proposed BBNJ Instrument of conserving and sustainably using biodiversity in ABNJ (BBNJ November 2019 Draft Text, arts. 2 and 6), including as part of the logic to the establishment of protected areas that will further require **monitoring and review**, and to the establishment of **coordination and consultation** mechanisms with a view to achieve one of the proposed objectives of ecosystem restoration and rehabilitation (BBNJ November 2019 Draft Text, arts. 14.e, 15.3, 16.1 and 21.4). However, the current draft text of the proposed BBNJ Instrument does not provide more information with regard to how the needed cooperation could be operationalised.

### 4.2 Steps to Enhance the Coherence of REMPs With the Proposed BBNJ Instrument Through EAM

The environmental management of the ISA in the Area, in particular through REMPs, needs to be intertwined with the overarching intentions for the negotiations on the proposed BBNJ Instrument, namely to build an effective governance framework for the protection of biodiversity in ABNJ. EAM-based governance could provide the necessary foundation, however, several key challenges to sectoral interplay have been identified by (Alexander and Haward, 2019) who recommend to a) create co-ordinating structures which operate across sectors, b) foster means of inter-sectoral communication and data-sharing, c) design participation processes to facilitate broad-scale participation. Further challenges consist in the limited mandate and governance structure of sectoral organisations (Matz-Lück and Fuchs, 2014), the likely imbalance of powers and means among stakeholders, and the need to bridge the communication divide between policy and science as well as to resource users (Langlet and Rayfuse, 2018; Amon et al., 2022). These challenges can only be overcome by inclusive, collaborative processes which are allowed sufficient time to mature (Slater and MacDonald, 2018).

Provided there will be agreement on strong provisions, the future instrument could eventually deliver the framework for steering sectoral and regional management in ABNJ through high-level conservation vision and goals, supported by a mandate for active interplay management between relevant bodies and organizing the collective multilateral work, including through area-based management tools (ABMTs), as well as processes for the application, implementation and monitoring of environmental impact assessments (EIAs) and strategic impact assessments (SEAs).<sup>32</sup> Such a polycentric approach (Gjerde and Yadav, 2021) based on a strong and visionary BBNJ Instrument is highly desired. Ideally, parties to the proposed BBNJ

<sup>31</sup>See: <https://undocs.org/en/a/conf.232/2020/3>.

<sup>32</sup>The considerations on marine genetic resources, usually found on the seafloor, the Area, and often associated to the mineral substrates of interest to ISA parties, are also highly relevant in context with developing a comprehensive, integrated management of biodiversity conservation and use in ABNJ (Tladi, 2015b; Salpin, 2016). Not discussed here.

Instrument would be in charge of coordination, integration and enforcement of coherent synergistic and verifiable (inter-) actions by the multitude of competent actors that individually and collectively strive to contribute towards achieving the overarching aims and ambitions of the Instrument, taking into account present and future challenges as well as the implications of climate change in all decisions.

This section specifically looks into options for enhancing the coherence between REMPs and the proposed BBNJ Instrument through an EAM lens, but the suggestions made in this section could be applied also to other sectors and more broadly for strengthening ABNJ governance in general. Recommendations made in this section relate to: 1. The coordinating role of ambitious **principles and goals** for biodiversity conservation in ABNJ; 2. The need for **collaborative arrangements** to achieve **integrated ocean governance**; and 3. Integration through **comprehensive environmental assessments**.

#### 4.2.1 The Coordinating Role of Ambitious Principles and Goals

As highlighted by Gjerde et al. (2018), ‘a common goal or purpose, participatory, and inclusive decision-making and coordination, and appropriate distribution of competence between the global and regional/sectoral levels’ would enhance successful cross-sectoral cooperation. Therefore, one way to stimulate more coherent governance processes and interplay between the regimes of the Area and the High Seas could be shared norms by way of parties adopting a common vision and strategic goals to biodiversity conservation in the proposed BBNJ Instrument. The vision- and goal-setting in the proposed BBNJ Instrument could influence the ISA’s efforts to comply with its mandate to take measures to ‘ensure effective protection for the marine environment from harmful effects which may arise from [such] activities in the Area’. With the adoption of the proposed BBNJ Instrument, States will set new norms for biodiversity protection in ABNJ that will also inform processes in other competent management bodies in ABNJ. ISA will have to assess and value the risks and environmental costs to be expected from commercial mining operations against these norms and biodiversity conservation ambitions. A stronger emphasis on protection could lead e.g. to a precautionary halt, a slow or small-scale start of activities, the prevention of mining in certain areas or regions, or other precautionary measures embedded in REMPs (see 4.3).

##### 4.2.1.1 Current Status in Draft Text<sup>33</sup>

So far, the general objective of the current draft text of the proposed BBNJ Instrument under which all States shall

cooperate is rather modest in its ambition and lacks in elaborating on a stronger and more assertive overall purpose of the conservation and sustainable use of marine biodiversity. Such a purpose could be for instance a) to ensure healthy and productive ocean,<sup>34</sup> and b) to increase the resilience of ocean ecosystems to climate change,<sup>35</sup> c) to initiate the ecological recovery of the ocean to meet the needs of present and future generations. The adoption of wording to highlight the link between biodiversity, climate, and a healthy and productive ocean in the objective of the future instrument, as well as in its Preamble, is crucial to open wide the necessity of cross-sectoral coherence.

##### 4.2.1.2 Strengthening the BBNJ Instrument in Line With EAM

To emphasise the overarching concern for long-term ocean health, the explicit recognition of the conservation of biodiversity as a ‘*common concern of humankind*’ should be added to the Preamble of the proposed BBNJ Instrument in the same way as in the CBD Preamble. This relates to certain key principles of interest to States, namely: intergenerational equity, international solidarity, shared decision making and accountability, and benefit and burden sharing through financial cooperation (Bowling et al., 2016). Intergenerational equity should be the guiding principle for determining a common understanding of and which actions are required to ‘*sustainably manage, and protect marine and coastal ecosystems...*’ in the High Seas and the Area alike (UN General Assembly, 2013; Bourrel et al., 2016; Doorn, 2016). In this line, ‘*environmental stewardship*’ should be another key principle to be applied throughout the proposed BBNJ Instrument to help implement a sustainable management of the natural environment, which is precautionary, integrated, and complementary, balancing different rights and interests, through the shared responsibility of present generations to maintain and improve the environmental status for future generations<sup>36</sup> (Ridings, 2018). This would complement the intergenerational equity and preservation norms of common heritage of mankind (Tladi, 2015a).

Further, we suggest that a long-term vision be agreed in the proposed BBNJ Instrument, e.g. incorporated in the preamble, building on the proposed 2050 vision and goals of the CBD Post-2020 Global Biodiversity Framework ‘*By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people*’ (Convention on Biological Diversity, 2020). Furthermore, clear links to Agenda 2030 and its Sustainable Development Goals (SDG), particularly SDG 14 on Oceans and Seas, could be made in the proposed BBNJ Instrument to streamline these global processes. Strategic goals and objectives, such as proposed by Tunnicliffe et al. (2020) will be needed to operationalise measures under the proposed BBNJ Instrument. For example, the strategic goals should include to take action to ‘*strengthen [their] resilience and take action for*

<sup>33</sup> See supplementary material (3) for the full text of the articles cited as in the Revised draft text of an 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 (A/CONF.232/2020/3, 18 November 2019).

<sup>34</sup> Compare SDG 14.2.

<sup>35</sup> As described by Yadav and Gjerde (2020).

<sup>36</sup> This corresponds to strong sustainability, as defined by e.g. Neumann et al. (2017).

[their] restoration,' as in SDG 14.2 of the 2030 Agenda (UN General Assembly, 2015).<sup>37</sup>

While the Preamble of the proposed BBNJ Instrument would clearly set the tone for the agreement the main text needs to give effect to these intentions made in the Preamble. This relates e.g. to provisions to allow for these visions, goals and objectives to be periodically reviewed and updated. In this respect, the proposed BBNJ Instrument might also benefit from the use of 'schedules', 'annexes' and 'protocols' that could comprise medium- and short-term environmental targets. This would allow them to be reviewed and updated periodically and more efficiently, e.g., by the proposed Scientific and Technical Body.

However, to be effective in guiding coherent multilateral action, a globally agreed biodiversity conservation vision and overarching goals need to be more than voluntary commitments and be enforceable. Therefore, an enforcement and compliance mechanism should be established under the proposed BBNJ Instrument to ensure that State Parties are meeting their conservation obligations as well as any other responsibilities (e.g., in relation to the conduct of environmental impact assessments). Such a mechanism would only apply to State Parties to the proposed BBNJ Instrument, and therefore States would be the ones responsible for ensuring coherent application, implementation, and compliance with measures across other instruments. The Conference of the Parties (COP), to be established under the proposed BBNJ Instrument, could however invite other agreements and organisations to report on the implementation of measures under their framework (BBNJ November 2019 Draft Text, art. 21.5). Proposals how this interface between the new instrument, the ISA and other sectoral management bodies could be strengthened are made further below.

#### 4.2.1.3 Steps to Enhance Coherence in ABNJ

In order to support the implementation of the biodiversity conservation vision and goals of the proposed BBNJ Instrument, sectoral and regional management bodies, such as ISA, would have to:

- a) Adjust its own environmental goals, policy and measures in line with the overarching vision, strategic goals and objectives as formulated in the proposed BBNJ Instrument;
- b) Ensure coherence of instruments such as the ISA REMPs with the global and regional conservation framework;
- c) For this purpose, create new or actively engage with existing regional ocean governance frameworks with regional stakeholders;
- d) Regularly inform the proposed BBNJ Instrument Secretariat/COP and provide updates on the implementation and monitoring of current management and conservation measures, for example as part of REMPs, and on the development of future measures (BBNJ November 2019 Draft Text, art. 21.5).

Indeed, in light of the proposed BBNJ Instrument and an ecosystem approach to governance in ABNJ, the common heritage principle applying to the Area and its mineral resources (Art. 136 UNCLOS) might also need a re-balancing from the

present ambitions to enable mining towards preventing harmful effects of such activities (Christiansen et al., 2019; Mickelson, 2019). While the ISA today acts more like a mining agency (Proelß, 2013) and developer than a custodian (Kim, 2017), the original concept was '*focused on solidarity and trusteeship, for the management of some of the most remote natural resources on Earth*' and therefore included environmental protection from the start (Mickelson, 2019; Jaeckel, 2020a). Indeed, it is likely that the environmental and biodiversity cost of exploitation of the seafloor minerals by far outweighs any other benefit to mankind (Jaeckel et al., 2017; Kim, 2017; Folkersen et al., 2018; Christiansen et al., 2019; Levin et al., 2020a; Singh, 2020; Krutilla et al., 2021; Thiele et al., 2021a; Thiele et al., 2021b).

#### 4.2.2 The Need for Collaborative Arrangements to Achieve Integrated Ocean Governance in ABNJ

Apart from the steering function of the proposed BBNJ Instrument to take effect on the actions of the individual ocean actors, all actors should be obliged by a duty to cooperate to increase the effectiveness of measures, such as spatial protection measures. From a conservation perspective, without universal recognition, unilateral sectoral measures in ABMTs, including MPAs, will in most cases not be sufficient to exclude harmful activities and might therefore not contribute to global biodiversity targets, such as the 30% spatial protection target under the CBD post-2020 Global Biodiversity Framework by 2030. This also holds for the APEIs designated by ISA, or for the OSPAR MPAs in ABNJ (see section 4.2.2). Complementary conservation and management measures are essential to take account of the ecological interconnectedness of the oceans (Dunn et al., 2019; Hays et al., 2019).

*Vice versa*, any ABMTs established by or designated under the proposed BBNJ Instrument would also require sectoral measures, including eventually through the ISA, to exclude harmful effects within its boundaries. It will be crucial to address the competing interests of mining, conservation and social values of certain deep seafloor habitats such as hydrothermal vent fields, seamounts. Without such a collaborative arrangement, conflicting questions may arise that could hardly be addressed. For example, will the ISA be able to continue contracting in designated EBSAs and affecting vulnerable marine ecosystems protected from deep-water fishing? Will the MPAs designated under the proposed BBNJ Instrument include the seafloor, the Area? How can already established MPAs like those of OSPAR on the Mid-Atlantic Ridge become effective for actors globally?

To ensure the coherence of measures across sectors, consultation and coordination processes could also be undertaken regionally, for instance through the REMP process, or through marine spatial planning (MSP)<sup>38</sup> exercises under the proposed BBNJ Instrument (Wright et al., 2019; Rayfuse, 2020).

<sup>38</sup>Described by IOC-UNESCO as '*a practical way to create and establish a more rational use of marine space and the interactions among its uses, to balance demands for development with the need to protect the environment, and to deliver social and economic outcomes in an open and planned way*', <https://ioc.unesco.org/index.php/topics/marine-spatial-planning> (accessed: July 2021).

<sup>37</sup><https://sdgs.un.org/topics/oceans-and-seas>

MSP can complement strategic environmental assessment and planning and has emerged as one way to successfully engage a broad range of stakeholders (Olsen et al., 2014) to cooperate and find solutions towards the achievement of the environmental goals and objectives as agreed, and to address the need to enhance transparency and accountability (Ardron et al., 2018; Ardron, 2020; Komaki and Fluharty, 2020). To date, MSP has only been applied within national jurisdiction, but it is considered to be a mechanism which could also help to enhance coordination efforts in ABNJ (Ardron et al., 2008; Altwater and Passarello, 2018; Gjerde and Wright, 2019; UNEP-WCMC, 2019).

#### 4.2.2.1 Current Status in Draft Text

At present, however, the proposed BBNJ Instrument does not provide a detailed mechanism on how to improve cross-sectoral collaboration nor include concrete provisions for operationalising a central integration or oversight. Rather, it leaves it to State Parties to promote coherence and complementarity when establishing ABMTs and MPAs in ABNJ, including through the adoption of conservation measures to complement existing measures designated under other frameworks and bodies, and to make consultation and coordination arrangements to enhance cooperation between relevant frameworks and bodies (BBNJ November 2019 Draft Text, arts. 15.1 and 15.3). So far, MSP is not mentioned in the current draft text of the proposed BBNJ Instrument, nor are there explicit provisions other regional or strategic mechanisms.

#### 4.2.2.2 Strengthening the BBNJ Instrument in Line With EAM

To become such a platform for integrated ABNJ governance, De Santo et al. (2019) suggest that the proposed BBNJ Instrument: a) needs to define its relationship with existing and future instruments, especially in case of inconsistencies; b) requires treaty bodies to cooperate and coordinate; and c) strengthens and operationalises UNCLOS Art. 195 regarding the no-transfer of hazards, damages or types of pollution, which calls for an integrated approach to environmental protection (Kim and van Asselt, 2016).

Options for practical arrangements to implement integrated biodiversity conservation in ABNJ are either through a mandatory cooperation requirement to all actors, through recommended collaborative arrangements among competent bodies, or as a minimum through voluntary commitments to collaborate towards a sustainable environmental governance agenda, such as through regional platforms mediating sectoral interests, regional spatial planning exercises complementing regional assessments, joint regional action plans or joint environmental monitoring programmes. Several constellations between central and polycentric governance arrangements are thinkable (Berry, 2021; Gjerde and Yadav, 2021). In any case, the sharing of competences and an unambiguous allocation of responsibilities to the different actors (Berry, 2021) as well as the will to mutual learning, building trust, adjustment and

coordination (Gjerde and Yadav, 2021) will be crucial to make progress to achieving the biodiversity goals.

#### 4.2.2.3 Steps to Enhance Coherence in ABNJ

At this stage, it is difficult to predict how coordination between both regimes might take place in practice, in particular, as mechanisms have to be found which do not undermine the effectiveness of measures taken by other competent organisations (Clark, 2020). Nevertheless, a key step will be to create effective institutional arrangements for reporting, assessment, and oversight to ensure that measures adopted under the proposed BBNJ Agreement and other sectoral organisations, including the ISA, are coherent and complementary towards achieving the objectives of biodiversity conservation in ABNJ. Otherwise, there would be a high risk that protective measures that are deemed vital for biodiversity conservation could be undermined by impacts from sectoral activities.

For the sake of building mutual responsibility for the outcome, we suggest initial mechanisms which could enhance coherence between the proposed BBNJ Instrument and the ISA, as an example for a sectoral organisation:

- a) A contact group between the proposed BBNJ Instrument and the ISA, as proposed by Belgium (Kingdom of Belgium, 2018), could be established. This could, for instance, serve as an exchange platform to bring together stakeholders from both processes (and potentially others) to discuss area-based management approaches and possible measures. Such a contact group can eventually be established as a joint committee under the proposed BBNJ Instrument, where sectoral groups could come together to discuss and take collective action on matters relating to spatial planning and conservation measures;
- b) The establishment of a joint scientific advisory body, or at least a coordinating mechanism to link the future Scientific and Technical Body of the proposed BBNJ Instrument (BBNJ November 2019 Draft Text, art. 49) and the corresponding organ of the ISA, the LTC, should be considered. Indeed, a commission to provide advice on ocean science and funding could help address current knowledge gaps (Danovaro et al., 2017; Singh and Jaeckel, 2018) and stimulate greater conservation efforts;
- c) The proposed BBNJ Instrument could also be used as an avenue for collective action and joint oversight. The establishment of a joint compliance and reporting committee could be encouraged under the proposed BBNJ Instrument, thereby integrating the efforts of ISA to manage the effects of mining-related activities in the Area through REMPs into context with the broader environmental governance of the respective region;
- d) Joint scientific and monitoring programmes could also be established under the proposed BBNJ Instrument to facilitate the review of measures, or to identify vulnerable areas and threats from human activities;
- e) The Clearing House Mechanism to be established under the proposed BBNJ Instrument could also serve as a centralized

platform for cross-sectoral information and data exchange and repository with respect to the establishment, implementation, monitoring and enforcement of spatial protection and other measures in ABNJ (BBNJ November 2019 Draft Text, art. 51).<sup>39</sup> Furthermore, external science platforms, such as the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) or the Intergovernmental Oceanographic Commission (IOC) of UNESCO, could provide relevant scientific assessments and information.

While the future powers of the Conference of Parties (COP) under the proposed BBNJ Instrument are still debated, we suggest that the COP, supported by the Secretariat, should have the mandate to establish these and other mechanisms for effective coordination to achieve integrated ocean governance in ABNJ. The ongoing UN Ocean Decade (2021-2030) presents an opportunity to gather experience on such knowledge-driven and collaborative interplay between various processes and actors in ABNJ.

#### 4.2.3 Integration Through Comprehensive Environmental Assessments

To address the problems around biodiversity conservation in ABNJ, the procedural mechanisms provided by Strategic Environmental Assessments (SEAs) are key to enable a more coherent, multi-sectoral governance and to better coordinate the connected Area-High Seas processes (Craik and Gu, 2019). SEAs and EIAs are closely linked, as SEAs generally provide guidance to project-specific EIAs. Such a SEA process, initialised through the proposed BBNJ Instrument, may act as an integrator of actors and interests, because it requires taking into view the whole of the ecosystem and its changes due to individual and cumulative effects of all human activities affecting a particular application area or region, from the seafloor to the surface rather than solely the effects on some of its components. As foreseen in various documents providing a framework on to operationalise strategic assessments,<sup>40</sup> this broad view and related adaptive decision-making on management is needed to prevent shifting baselines through informed decision-making, acknowledging uncertainties and knowledge gaps and risk-averse, inclusive decision-making.

##### 4.2.3.1 Current Status in Draft Text

In its current draft, the text of the proposed BBNJ Instrument requires States Parties – either individually or in cooperation with other States Parties to this effect – to ensure that a SEA is carried out for plans and programmes associated with activities in ABNJ, which meet the same thresholds or criteria that will likely be established for triggering the application of EIAs in ABNJ (BBNJ November 2019 Draft Text, art. 28). Which exact activities would trigger such a process is still under negotiations, and there is currently no further elaboration on how this could be achieved nor who would concretely perform these SEAs and what its implications would be in terms of application and enforcement.

Project-specific EIAs, on the other hand, remain single-sector tools, applied under the proposed BBNJ Instrument, and through competent authorities such as the ISA. It is as yet unclear which degree of alignment will be possible to achieve and what the relationship of sectoral EIAs will be with the proposed BBNJ Instrument. As an example, the relationship between the EIA process to be established under the proposed BBNJ Instrument and already established EIA processes under the ISA, is not yet determined. At present, several considerations exist, including the creation of a cross-sectoral coordination and consultation mechanism through the BBNJ Scientific and Technical Body (STB), the setting of global minimum standards for existing and future EIA processes in ABNJ, and the possibility of frameworks and bodies with existing EIA obligations already in place would need to conform to the EIA requirements to be established by the proposed BBNJ Instrument (BBNJ November 2019 Draft Text, art. 23).

##### 4.2.3.2 Strengthening the BBNJ Instrument in Line With EAM

The operationalisation of SEAs therefore needs to be taken up more strongly in the proposed BBNJ Instrument and concrete objectives, minimum standards, and coordination mechanisms towards the application of SEAs in ABNJ need to be established. Furthermore, there should be a more prominent link in the proposed BBNJ Instrument between the SEA process and the establishment of ABMTs. At the moment, both of these elements are negotiated and drafted separately in the draft text of the proposed BBNJ Instrument. However, undertaking an SEA could, for instance, provide the scientific basis required to define where coherent networks of ABMTs should be established, it is therefore important to ensure a stronger link between these two elements in the future treaty.

Several tools complementary to SEAs are available to support enhanced transparency and outreach by existing organisations in ABNJ, like the ISA, and which would be needed also to operationalise it under the proposed BBNJ Instrument. These are e.g., a) stakeholder mapping; b) institutionalised information exchange, incl. data standardization; c) a clearing house mechanism for information collection and exchange; and d) initiate a collective arrangement with other existing bodies in the region. The OSPAR Collective Arrangement, for instance, is instructive for developing tools such as coherent assessment criteria and evaluation (NEAFC and OSPAR, 2015).

##### 4.2.3.3 Steps to Enhance Coherence in ABNJ

Undertaking regular regional assessments in regions with REMPs could be a highly effective tool for ISA to contribute to EAM in ABNJ, if done in a strategic, cross-sectoral way. The regional focus taken by ISA offers the opportunity to use the REMP planning cycle as a platform for enhancing broad knowledge integration, adaptive management towards achieving environmental – i.e., conservation and restoration – goals,<sup>41</sup> as well as conflict resolution at the regional scale. A

<sup>39</sup> Also discussed in Berry, D.S., 2021. Unity or Fragmentation in the Deep Blue: Choices in Institutional Design for Marine Biological Diversity in Areas Beyond National Jurisdiction. *Frontiers in Marine Science* 8.

<sup>40</sup> See e.g. United Nations (2003) and European Commission (2003).

<sup>41</sup> The use of the terms goals-objectives-targets is inconsistent in agreements and other literature. We here use goals in the sense of overarching and/or strategic goals, supported by medium-term operational objectives and management targets in line with the SMART scheme (ICES, 2005).

systematic, ecosystem-based approach to regional planning, preferably by way of a strategic [environmental] assessment (SEA)<sup>42</sup> (Warner, 2016; Craik and Gu, 2019; Jaeckel, 2020b), regional environmental assessment (REA)<sup>43</sup> (Jones et al., 2019) or another form of integrated management (Ban et al., 2013; Ban et al., 2014; Stephenson et al., 2019) would possibly help to remedy some of the current short-comings of the REMP planning and contracting, and open new avenues for integration with the global conservation agenda as agreed in the proposed BBNJ Instrument.

Tiered REMP assessments carried out by the ISA, *i.e.* a hierarchy where regional assessments determine REMP which set the conditions for local project EIAs (Jones et al., 2019) could therefore feed into a SEA under the proposed BBNJ instrument for a defined ocean region. Likewise, ISA REMP assessments should seek coordination with the respective regional conservation organisations and adjacent coastal States. Ideally, a strategic assessment would investigate the environmental, economic and social effects of the ISA policy globally, and of draft REMP regionally before the adoption of any mining plans. A strategic assessment, however, is currently not planned, and due to the practical challenges of interaction of one sectoral organisation with others, REMP measures truly considering cumulative human impacts may be unrealistic under the current set-up.

Such a tiered approach to environmental assessment has been outlined also for consideration in developing the scope and procedures for EIAs in the proposed BBNJ Instrument (Warner, 2016; WWF, 2016; Doelle and Sander, 2020). It could mean that under the proposed BBNJ Instrument planning regions would be determined for biodiversity conservation, facilitating SEA-type ecoregion-scale assessments of cumulative, cross-sectoral and transboundary activities and related impacts on the marine environment together and as a whole *vis à vis* binding and non-binding strategic and operational goals and objectives (Tunncliffe et al., 2020).

## 5 CONCLUSION

While strong political will is needed to transform the current governance system in ABNJ, the parallel negotiations on the proposed BBNJ Instrument and the development of ISA Mining Code, including REMP provide the unique chance to approach comprehensive, integrated ocean governance through the implementation of an ecosystem approach to management. This provides the opportunity to: (1) better integrate discussions in the sectorally divided sphere of international

ocean governance; (2) improve the data collection and exchange and adopting a common understanding on management priorities; (3) work towards a fair and more equitable management of biodiversity and mineral resources in ABNJ; and (4) reduce time and cost, considering that activities in ABNJ are logistically demanding, technologically dependent and economically expensive.

However, despite decades of calls for greater integration in ocean, climate and biodiversity policies, there appears to be an inertia in ABNJ governance and preference among many parties to maintain the sectoral *status quo*, as reflected in the current draft text of the proposed BBNJ Instrument and the ISA REMP development process. To ensure real progress in combating the linked global biodiversity and climate crisis, the proposed BBNJ Instrument should serve as a 'stronghold' for EAM, using the parallel negotiations in both processes as a window of opportunity to arrive at a common understanding as to what the EAM, and in particular precautionary management means in practice and how key principles (e.g., longterm maintenance of ecological integrity, transparent and inclusive planning, a knowledge-based management cycle) are operationalized in ABNJ. This would require synergistic institutional interplay and a common agreement of how regional and sectoral organisations (e.g., by taking necessary measures, such as REMP adopted by the ISA) could best support BBNJ governance and *vice versa*. This requires improvements to be made. The REMP planning cycle should *inter alia* be informed by an intensive exchange with all relevant users and regulators in the regions, including through building up a common knowledge base, clearing house mechanism, common research and monitoring programmes. The REMP adopted by the ISA would have to be open to review to align with the final BBNJ Instrument.

Moreover, the proposed BBNJ Instrument should be instrumental to unifying biodiversity protection standards and enabling a multifaceted governance landscape to cooperate towards retaining the health of ocean ecosystems for the benefit of all by providing an overarching conservation vision and strategic goals for ABNJ.

**Box 1** summarises initial recommendations put forward by the authors in this paper on how to enhance the coherence of biodiversity conservation in ABNJ, using REMP as a case study to further global biodiversity conservation goals and the proposed BBNJ Instrument as an opportunity to promote cross-sectoral collaboration in ABNJ premised on EAM. Though this paper focused on the coherence between REMP and the proposed BBNJ Instrument through EAM, suggestions made in this paper could be applied to other sectors and more broadly for strengthening integrated ABNJ governance in general.

## DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/**Supplementary Material**. Further inquiries can be directed to the corresponding author.

<sup>42</sup>Strategic Environmental Assessments (usually including social and economic assessment strands) are transboundary assessment procedures, including high resolution risk assessments and eventually spatial planning to scrutinise the environmental effects of existing and upcoming policies, plans of programmes with regards to their comprehensive effects compared to pre-agreed overarching visions and objectives for the respective regions.

<sup>43</sup>Regional Environmental Assessments are broad-scale tools delivering the essential regional baseline environmental and human activity information.

**BOX 1 | Summary of recommendations.****Recommendations for making ISA environmental governance and Regional Environmental Management Plans more coherent with integrated, ecosystem-based governance in ABNJ and alignment with the proposed BBNJ Instrument**

- Establish an Environmental or Scientific Commission, or at least greatly enhance the environmental expertise to inform decision-making at the ISA.
- Establish a contact group between the ISA and the proposed BBNJ Instrument, as proposed by Belgium.
- Align the global and regional environmental conservation efforts subject to Article 145 of UNCLOS (effective protection from mining-related harm) with those of the proposed BBNJ Instrument or adopt ones that are more ambitious.
- As a minimum, respect existing and planned designations of marine protected areas and other precautionary spatial conservation designations, such as EBSA and VME designations, through other organisations, including the proposed BBNJ Instrument, in all or parts of the Area and overlaying High Seas when developing regional management plans, REMPs, and when adopting or reviewing the Plans of Work of applicants for exploration and exploitation licenses.
- Join the Collective Arrangement initiated by OSPAR and NEAFC.
- Apply and operationalise the criteria for identifying vulnerable and particularly sensitive species, habitats, and seascapes, as implemented by regional fisheries management organisations (to identify VMEs), the International Maritime Organisation (to identify PSSAs), regional environmental conventions and States, in relation to risks from mining-related activities.
- Establish the procedures to enable systematic and transparent communication processes with management authorities and stakeholders in the respective regions and contract areas. This will enhance transparency, support a holistic view on risks to and trends in the environment, and prevent overlooking existing interests, as has already happened with underwater cables crossing through later designated exploration areas.
- Enable the uniform application of environmental standards by developing and implementing the REMPs in all ocean basins in a standardised way, including through shared principles, ambitious conservation goals, comprehensive assessment, e.g. SEA, decision-making procedures and measures enhancing the precautionary spirit of the ecosystem approach including through acting as a cross-sectoral collaboration platform.
- Use REMPs as a case study for the regional implementation of an ecosystem approach for integrated and adaptive management and cross-sectoral collaboration to achieve an inclusive and future proof governance regime in ABNJ.
- Consider an explicit environmental strategy imbedded into the follow-up ISA Strategic Plan after 2023 as the best means to integrate the ISA efforts to protect marine biodiversity from the effects of mining with the vision and objectives of the overarching proposed BBNJ Instrument.
- Contracting should be linked to the respective REMPs: Regionally, until mining impacts can be fully predicted, a staged or staggered approach (spatial and temporal) of mining activities is needed, as well as making the approval of exploitation applications, or later on the permission to proceed with commercial production, contingent upon contractors being able to demonstrate a) its ability to manage environmental harm via test mining projects, and b) that the environmental cost, while below the 'serious harm' threshold to be determined, does not exceed the benefit to mankind from mining. REMPs should be constantly updated as knowledge increases.
- A strong vision and strategic goals for biodiversity conservation in ABNJ might encourage a re-envisioning of the common heritage of mankind, in particular in view of the environmental and social costs of deep seabed mining.

**Recommendations for strengthening the ecosystem approach to management and coherence of measures in the proposed BBNJ Instrument**

- Spell out a long-term vision, accompanied by strategic goals, which highlight the intrinsic links that exist between biodiversity, climate, and healthy and productive oceans, including their ecological recovery to meet the needs of present and future generations, both in the Preamble and the objective (strategic goals) of the proposed BBNJ Instrument. The vision should be at least as ambitious as the vision and goals of the CBD post-2020 Global Biodiversity Framework.
- Add to the Preamble the '*common concern to humankind*' in the same way as the CBD Preamble, namely '*Affirming that the conservation of biological diversity is a common concern of humankind*'.
- Articulate how key principles (e.g. the precautionary approach, ecosystem approach, and best environmental practices) and procedures (e.g. SEA) are operationalized in ABNJ. An ABNJ Biodiversity Strategy will support this.
- Incorporate secondary means into the proposed BBNJ Instrument (such as 'schedules', 'annexes' or 'protocols') that would allow the introduction of specific operational and technical measures (e.g. specific short-term environmental targets) that can be reviewed and updated periodically and more efficiently.
- Make the proposed BBNJ Instrument a 'stronghold' for EAM, possibly using this as a window of opportunity to arrive at a common understanding as to what EAM means and how it applies in the context of ABNJ, while leaving it to sectoral organisations to implement (e.g. by taking necessary measures, such as REMPs adopted by the ISA).
- Use the proposed BBNJ Instrument as an avenue for collective action and joint oversight:
  - a. Establish a joint scientific advisory body, or at least a coordinating mechanism to link the Scientific and Technical Body of the proposed BBNJ Instrument and the corresponding sectoral science advisory organs such as the ISA Legal and Technical Commission. Such a joint scientific advisory body could for example also complement the development of sectoral REMPs by way of all-inclusive regional SEAs.
  - b. Establish concrete objectives, minimum standards, and cooperation mechanisms towards the application of SEAs in ABNJ, as well as a more prominent link between the SEA process and the establishment of ABMTs.
  - c. Establish coordinated, coherent, large-scale marine monitoring programmes covering all waters, including the deep-sea and finance research on the environmental baselines of particular areas, including the determination of appropriate and measurable indicators and metrics which can be used to check the direction of change of environmental health.
  - d. An enforcement and compliance mechanism could be established under the proposed BBNJ Instrument. This could include a joint reporting committee under the proposed BBNJ Instrument to which all actors would have to report progress made towards achieving the strategic and operational goals. The committee would integrate knowledge, promote coherence, and recommend action needed.
- The proposed BBNJ Instrument and the ISA's regulatory regime would benefit from clear provisions that define their relationships with existing as well as future instruments and requires cooperation with other competent organisations and their bodies.

## AUTHOR CONTRIBUTIONS

SC initiated the concept and managed the writing process. This was a truly cooperative endeavour. All authors discussed, elaborated, reviewed and contributed to the final text. All authors contributed to the article and approved the submitted version.

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## SUPPLEMENTARY MATERIAL

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