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Blue Growth and Sustainable Development in Indian Ocean Governance

March 2017

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Acknowledgements and disclaimer

This policy brief draws on The Hague Institute's work on the Global Governance Reform Initiative (GGRI) project, which is a collaborative effort between The Hague Institute, the Ministry of Foreign Affairs of the Netherlands, and the Observer Research Foundation (New Delhi). The authors would like to thank the participants of the international workshop on Oceans Governance, convened in 2016 at The Hague Institute, for their contributions, as well as Prof. Roel van der Veen from the Ministry of Foreign Affairs of the Netherlands, Willem Schoustra from the Ministry of Economic Affairs, Claire van der Geest, and Lianne Kersbergen from the Ministry of Economic Affairs for their valuable input. The responsibility for the contents of this brief rests with the authors and does not necessarily reflect the views of The Hague Institute for Global Justice or the workshop participants. For any questions or comments, please contact the authors.

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Blue Growth and Sustainable Development in Indian Ocean Governance

Executive summary

The existing architecture to ensure sustainable development in the high seas in the Indian Ocean exhibits numerous shortcomings. This policy brief addresses the most pressing gaps and proposes a set of policy recommendations, including specific first steps that ought to be taken in the near future. These include Marine Protected Areas (MPAs) as part of spatial management of fisheries, the possibilities of creating new or expanding existing governance instruments, and enhancing enforcement measures that are required to make a multilateral, comprehensive governance instrument for the Indian Ocean effective. The policy brief argues that more advanced forms of governance of regional seas need to be established that will support better cooperation and communication between governments and wider stakeholder communities. Furthermore, sustainable development in the Indian Ocean requires a well-functioning framework that is geographically inclusive and covers a wide range of species. Developing countries should be given assistance in this process and the private sector, the scientific community as well as local communities should be fully involved. Monitoring, control, and surveillance of any areas covered in existing and future treaties (including MPAs) will also depend on countries and the private sector working together. Uniform standards for fisheries are dependent on effective data collection and reporting, requiring a commitment from all parties involved to gather and share this information. Together, these recommendations aim to create an inclusive and cooperative governance structure for the Indian Ocean in the service of blue growth.

List of Abbreviations

ABNJ	Areas Beyond National Jurisdiction
CBD	Convention on Biological Diversity
CCBSP	Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea
CCSBT	Commission for the Conservation of Southern Bluefin Tuna
FSU	Fisheries Support Unit
GDP	Gross Domestic Product
IATTC	Inter-American Tropical Tuna Commission
IORA	Indian Ocean Rim Association
IOTC	Indian Ocean Tuna Commission
IUCN	International Union for Conservation of Nature
MPA	Marine Protected Area
MSP	Marine Spatial Planning
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
SDGs	Sustainable Development Goals
SIOFA	South Indian Ocean Fisheries Agreement
SWIOFC	Southwest Indian Ocean Fisheries Commission
UNCLOS	United Nations Convention on the Law of the Sea
UNFSA	United Nations Fish Stocks Agreement
WCPFC	Western and Central Pacific Fisheries Commission

Introduction

The Sustainable Development Goals (SDGs) were adopted at the United Nations Sustainable Development Summit in New York in September 2015. Goal 14 of the SDGs is devoted to the conservation and sustainable use of the oceans, seas and marine resources for sustainable development. An objective specifically focused on the oceans is an important step forward, given that the oceans cover nearly three quarters of the earth's surface, making it the world's single largest ecosystem and a massive arena for intertwining issues such as climate change, human livelihoods, commerce, and security. According to the Global Ocean Commission, 3 billion people rely on the ocean for their livelihoods; worldwide, 350 million jobs are linked to the ocean; and 5% of the world's GDP consists of the market value of marine and coastal resources.[1]

In the Indian Ocean, these matters are especially pressing due to its numerous coastal states, many of which are developing countries,[2] which host hundreds of millions of people who rely on the ocean's resources for their food security. Given the continuing growth of the human population in the coming decades, urgent action in the improvement of governance structures is crucial in order to preserve the Indian Ocean's resources for future generations, including those in areas beyond national jurisdiction (ABNJ), i.e. the high seas and the seabed subsoil beyond the limits of national jurisdiction. This importance was clearly recognized by the members of the Indian Ocean Rim Association (IORA) in their Mauritius Declaration on Blue Economy of September 2015.[3]

Action in this domain requires extensive cooperation between the community of coastal states and a range of other stakeholders. The latter include other states that have an (economic) interest in the region, the private sector, non-governmental organisations, the scientific community as well as local communities. There exists a variety of partnerships in which these parties are brought together, though in varying constellations.[4] However, existing partnerships do not include all the relevant actors, nor do they cover the entire Indian Ocean. Additionally, at present there is a lack of coherent governance instruments among the parties involved, which inhibits sustainable development and blue growth in the Indian Ocean – including issues such as food security, healthy and preserved fish stocks, and biodiversity.

Drawing on existing examples of promoting blue growth and sustainable development in other oceans, this policy paper provides a set of recommendations for improving the governance in the high seas of the Indian Ocean. The first section of the policy brief scrutinizes the establishment of Marine Protected Areas (MPAs) as part of spatial management of fisheries in the high seas of the Indian Ocean. The second section focuses on the possibilities of creating new or expanding existing governance instruments in the Indian Ocean. The final section centres on enforcement measures that are required to make a multilateral, comprehensive governance instrument for the Indian Ocean feasible. Policy recommendations are included at the end of each section and are summarized in the conclusion.

Marine Protected Areas in the Indian Ocean

Currently, there are more than 26 MPAs in the Indian Ocean. However, these exist all within exclusive economic zones and do not cover any areas beyond national jurisdiction (see Figure 1).[5] MPAs are a crucial tool for making the overall maritime environment more resilient by preserving maritime resources, combatting pollution, and contributing to climate change mitigation. However, management of the existing MPAs varies, as they are all established in isolation by different countries – lacking regional ecological vision and cooperation.[6] If MPAs are to be established in the high seas of the Indian Ocean and their full potential is to be realised, a comprehensive approach is needed.[7]

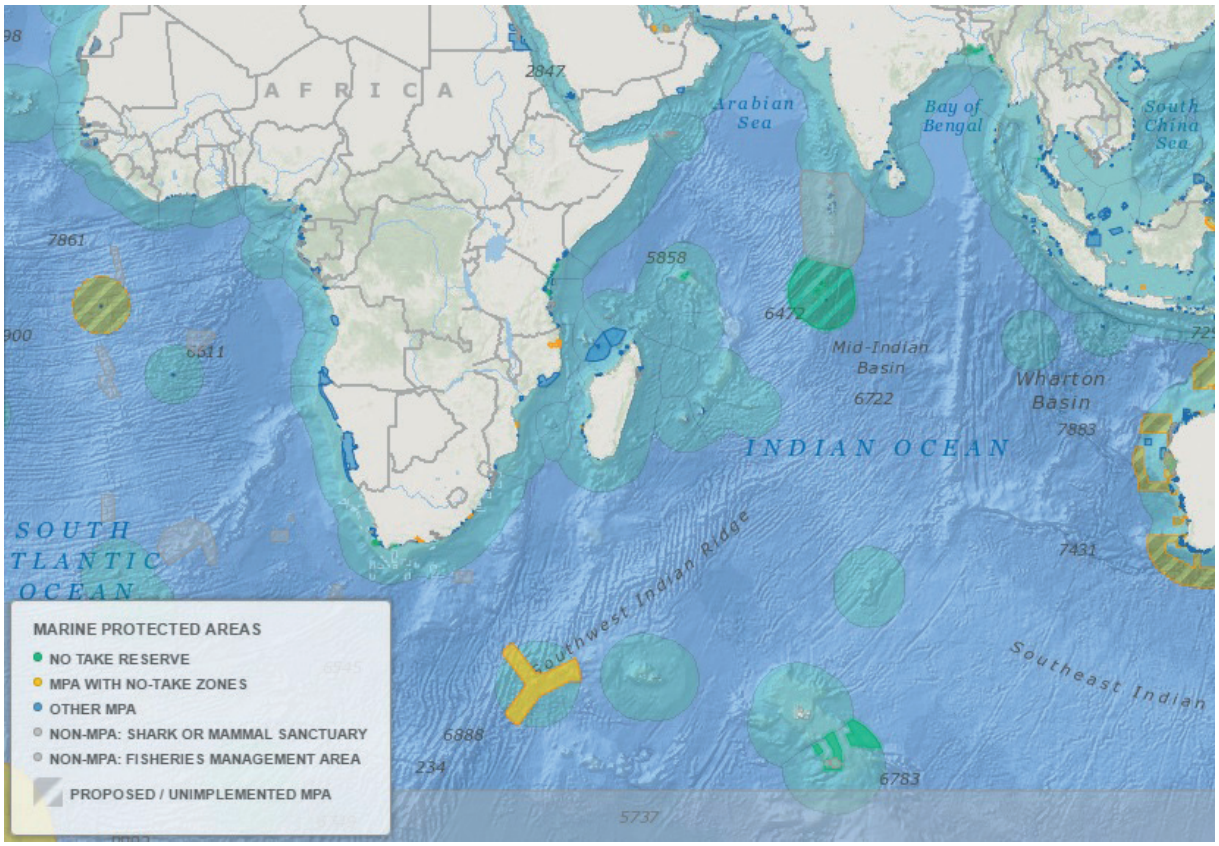

Figure 1: MPAs in the Indian Ocean, currently all within exclusive economic zones[8]

A protected area is "a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values."[9] Effects of individual MPAs will vary, as different MPAs impose different restrictions. For example, MPAs where no fishing or other extractive activities are allowed can show a rapid increase in fish population, which is detectable after two to three years.[10] Within many of these "no-take" MPAs, fish stocks have been restored.[11] The most important benefit of these measures is that when the number of juvenile and adult fish increases, these fish will also move to areas outside of the protected area, which will increase fishery yields in surrounding regions.[12] Multiple scientific and management studies show that the optimal proportion of a marine ecosystem that "should be included in no-take or highly protected MPAs or zones is about 30%".[13]

A decision adopted by the Conference of Parties to the Convention on Biological Diversity of 2004, building on the Durban Action Plan of the IUCN, called for "the establishment and maintenance by 2010 for terrestrial and by 2012 for marine areas of comprehensive, effectively managed, and ecologically representative national and regional systems of protected areas",[14] which should include also protected areas in ABNJ in accordance with applicable international law. Ever since, MPAs have been on the rise, with currently more than 13,000 MPAs covering close to 3% of the global oceans,[15] including large-scale examples such as the Papahānaumokuākea Marine National Monument off the coast of Hawaii, which was expanded in 2016 to now cover an area twice the size of Texas. However, at present few MPAs exist in ABNJ worldwide, and only one network of MPAs in ABNJ. The network of six MPAs was established in 2010 in the high seas of the North-East Atlantic Ocean. They were created by OSPAR, a mechanism in which 15 national governments and the EU cooperate to protect the North-East Atlantic Ocean. OSPAR acts under the overarching legal framework of UNCLOS. As the process of establishing high seas MPAs was – and still is – relatively new, the many lessons learned from this case are particularly useful in the establishment of MPAs in the high seas of the Indian Ocean. OSPAR could only make swift progress on the network of MPAs because its parties already had well-established cooperative relationships on issues of environmental protection, thus indicating the necessity of consolidating such relationships before starting the process of creating MPAs. A platform such as OSPAR is important as it can facilitate cooperation and communication amongst contracting parties as well as other competent authorities for creating MPAs in ABNJ. As there currently is no global implementing agreement for MPAs under UNCLOS, a regional convention seems to offer the best approach to establish MPAs in ABNJ.

To ensure an effective introduction of MPAs in the high seas, spatial planning and management of marine areas serve as a useful framework. The benefit of Marine Spatial Planning (MSP) is that it is ecosystem-based, area-based, integrated, adaptive, strategic and participatory. MSP is a future-oriented planning process that takes into account all the sectors related to the governance of maritime issues. It is able to allocate marine space both geographically and temporally for different purposes. For instance, through spatial management of fisheries, fish stock levels can be managed in designated areas. In a similar way, scientific research can be used to negotiate the limiting of fishing during certain timeframes, such as spawning seasons. Such a scientific approach can help to motivate sceptical stakeholders to help introduce MPAs in the high seas in the Indian Ocean.

MPAs, preferably seen as part of MSP, are a means to achieve sustainable development and blue growth in the high seas of the Indian Ocean. MPAs can benefit the current generation – both human and marine species – as well as maintain high seas resources for future generations. In order to establish effective MPAs, the following recommendations should be considered:

- **Establishing a regional seas convention (or a similar kind of cooperation)** will facilitate and coordinate the implementation of MPAs in the high seas of the Indian Ocean.
- **MPAs should be part of MSP** to ensure a comprehensive, international approach to conservation of the high seas of the Indian Ocean.
- **Objectives of MPAs need to be clearly defined** and their **social implications** – in terms of employment and other priorities for developing states – need to be examined before implementing them.

In order to ensure the effectiveness of the introduction of MPAs in the high seas of the Indian Ocean, the subsequent section focuses on enhancing cooperation and governance structures.

Coherent cooperation and governance in the Indian Ocean

At present, several gaps exist in the governance arrangements of the Indian Ocean that hinder the implementation of sustainable development and blue growth.[21] Closing these gaps is imperative in order to cultivate, among other things, sustainable fishing practices.

First, the limited coverage of the Indian Ocean Tuna Commission and the Southern Indian Ocean Fisheries Commission leaves various species unprotected in different geographical areas, notably

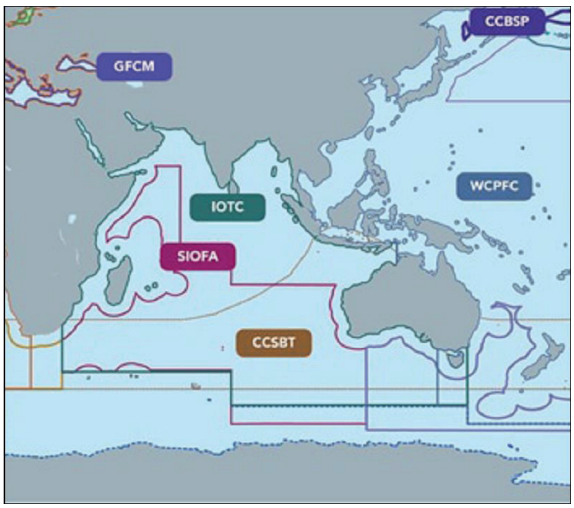

Figure 2: RFMOs in the Indian Ocean[22]

non-highly migratory, shared and straddling fisheries resources in the high seas in the northern region of the Indian Ocean. Moreover, pelagic shark species, among others, currently are not addressed in any of the relevant treaties, leaving them without official protection measures in the Indian Ocean.

Second, no single overarching organisation covers all Indian Ocean coastal states in its membership. SIOFA currently involves only eight countries. At the same time opportunities for additional members are limited since the organisation only covers the high seas of the Southern Indian Ocean. Although the IOTC has a broader reach, it only covers tuna-like species. Meanwhile, Bangladesh and Myanmar are fishing in the relevant areas, as they are not yet part of one of these treaties. As presently constituted, these regional fisheries management organisations (RFMOs) represent a sectoral approach to ocean management which focuses solely on certain types of fish species. As a consequence, research and monitoring efforts are dispersed, and fall short of an integrated understanding of the relevant ecosystems.

In order to address these gaps, the existing governance framework of IOTC, SIOFA, SWIOFC, and IORA's Fisheries Support Unit should be strengthened with regard to the species covered, the regulation of membership, and the duties of the different state actors. Most importantly, the agreements regarding non-highly migratory species should be extended to the entire area of the Indian Ocean. Currently, nearly all countries[25] in the region are already members of UNCLOS, and a few are members of United Nations Fish Stocks Agreement, which governs the management and conservation of fish stocks. Nonetheless, sustainable fisheries management is best delivered at the regional level in order to strike a pragmatic balance between commitments at a global scale and at the scale of individual ecosystems.[26]

In addition, currently excluded species such as sharks should be covered in one of the governance instruments. Although it is true that many RFMOs focus exclusively on commercial fish stocks, there are recent examples of RFMOs that govern other species in the marine ecosystem. For example, the Western and Central Pacific Fisheries Commission, while primarily focusing on tuna, is also responsible for sharks, seabirds, and turtles affected by fishing. Likewise, the Inter-American Tropical Tuna Commission is currently applying an ecosystem approach, entailing that it considers all marine species within its convention area. Such changes would require renegotiation by those organisations covering (parts of) the Indian Ocean, but most importantly the IOTC and SIOFA, since these organisations can develop binding policies. At this moment, IOTC members are already in the process of modernizing the treaty. With the results

of this process best practices can be formulated, providing an indication of the obstacles that other organisations might face.

In parallel to this process, a new framework agreement could be negotiated, in order to integrate scientific management and enforcement in the Indian Ocean. This could be done under the auspices of IORA, which is the only regional forum bringing together most countries on the Indian Ocean rim through an annual foreign ministers' meeting.[27] At IORA's Meeting of the Council of Ministers in Perth in 2014, a commitment was made with the objective of "strengthening the blue economy".[28] To live up to this commitment, however, a more prominent and legally entrenched role in the field of sustainable oceans governance is required for IORA, as well as a boosting of IORA's resources and dedicated leadership by key countries such as India, Australia and South Africa.

The envisaged agreement would function as a "dome" for a treaty system of Indian Ocean governance, providing an overarching framework for sub-regional and sectoral approaches. An inclusive multilateral framework agreement offers the possibility to introduce an ocean-wide system of governance, covering the allocation of fishing rights, combating pollution, climate change mitigation, and other systemic issues. Such a new framework agreement would have the added benefit of reducing the regulatory burden created by having multiple treaties and governance programs in different, overlapping areas. Moreover, it would cover the high seas area of the Indian Ocean, as well as the seabed and subsoil (i.e. ABNJ), and could include an opt-in clause for exclusive economic zones. Management of highly-migratory fishery resources and non-highly migratory, shared and straddling fishery resources would have to be included, although the overseeing commissions could be separated.

Both proposals, strengthening existing governance programs and creating a framework agreement, need to incorporate developing country assistance in order to ensure both equitability and effectiveness.[29] On the global level, Part VII of the UNFSA addresses the requirements of developing states, including the establishment of special funds to assist developing states in their participation in fisheries management organisations and arrangements. Following the regional example of the WCPFC, a new agreement could incorporate a special fund for this purpose. In addition, the level of dependence by developing states on relevant stocks should be measured and taken into account in fisheries management decisions. Similarly, contributions to the RFMO should reflect the ability of these states to contribute financially.

Another essential feature of more effective governance of the Indian Ocean is involvement of the business sector and local communities. While governments draft and sign the treaties, the fishing is done by the companies and fishers. Consequently, the private sector and representatives of local communities need to be consulted in advance on new reforms in the form of treaties, measures or policies. Important steps in this domain already exist, such as the incorporation and academia and the business sector into IORA's "tripartite structure". Moreover, the possibility for relevant non-state stakeholder groups to obtain observer status should be included in any new and existing agreements, as it exists already in the cases of OSPAR and the IOTC. Such a status should include participation in the meetings and encourage active contributions to the various treaty bodies' work in shaping policy development, capacity-building, and implementation. In addition, various stakeholder groups should be given the opportunity to organize themselves into advisory bodies, taking inspiration, for instance, from the advisory council created as part of the EU's common fisheries policy. Importantly, this includes the scientific community, as envisioned sustainable fishing practices must be scientifically supported. Scientific explanation is essential in order to create support among private actors, convince stakeholders that improving sustainable fish stocks is in their own interest, and minimize losses for companies and fishermen.

In order to allow for effective cooperation and clear governance in the Indian Ocean, there is added value in enhancing existing structures and working towards a comprehensive framework agreement. Moreover, such a system needs to be inclusive in the sense that relevant stakeholders are able to participate effectively. To this end, the following recommendations should be considered:

- **Comprehensive coverage:** a treaty system for Indian Ocean Governance should be established, topped off with a new framework agreement, which should be both geographically inclusive and wide-ranging in terms of the species it covers.
- **Empowering disadvantaged parties:** regardless of the exact governance structure chosen, developing country assistance should be incorporated into the treaty system.
- **Involve the private sector and local communities:** any successful initiative needs to incorporate relevant stakeholders such as the private sector, the scientific community, and local communities in order to create a jointly owned strategy for the Indian Ocean, through granting observer status and creating advisory bodies.

Both reform of existing treaties and the creation of a new framework agreement call for long-term vision. In order to ensure that coherent cooperation and governance in the Indian Ocean are not only established but also maintained, effective enforcement measures are essential, as will be discussed in the following section.

Monitoring and enforcement measures in the Indian Ocean

At present, governance arrangements providing Indian Ocean-wide monitoring and enforcement measures in support of sustainable development and blue growth, and fisheries management in particular, are lacking coordination. Both IOTC and SIOFA have means at their disposal to combat illegal, unreported, and unregulated fishing. These include satellite-based systems such as vessel monitoring systems (VMS), which can observe vessels fishing on high seas in real time, and blacklisting and application of trade restrictions and sanctions. These tools can engage with fishers and restrain the number of fishers and/or fishing activities in order to reach sustainable fish stocks in the high seas.[30] However, tools are not coordinated on a regional, national, and international level, which would be necessary to make more multilateral, comprehensive governance instruments for the Indian Ocean effective.[31]

The full range of enforcement measures includes surveillance, monitoring, inspections, observations, apprehension, reporting, trial and punishment – known as monitoring, control and surveillance (MCS). Tools used for enforcement are not scarce, and effective technological solutions are already available.[32] There are for example catch and trade documentation schemes, joint inspection schemes, and an at-sea presence through vessels and aircraft.[33] However, often the problem lies within the inconsistent and sporadic application of these tools, lack of capacity for implementation, a lack of clarity over which actor has enforcement rights, and a lack of structured cooperation. One explanation of these problems is the presence of large numbers of actors with different levels of capabilities, normative outlooks, and strategic attitudes, which makes it difficult for a country to take a position as key player in sustainable development and blue growth in the Indian Ocean.

Comprehensive and effective MCS systems are needed in order to reduce non-sustainable fishing practices and broader non-sustainable development in the Indian Ocean. Moreover, through a more efficient use of monitoring and enforcement measures, commitment of state and non-state actors to sustainable development and its oceanic dimension can be improved. The kind of MCS systems proposed here consist of integrated systems to identify and deter non-compliance in the field through independent verification and auditing.[34] Data concerning the Indian Ocean and its scientific scrutiny are usually limited and poorly shared. Additional data collection, improved data sharing,

scientific analyses concerning fishing activities and environmental impacts in the region, and the inducement of compliance by vessel operations are needed to monitor and adaptively improve cooperation and governance throughout the Indian Ocean.[35]

In order to accomplish this, uniform standards must be set for the collection and reporting of fishery-dependent data. For instance, the Niue Treaty Subsidiary Agreement for the South Pacific Region shows that sharing fisheries data and intelligence enables the pooling of limited resources, capacity and assets. Furthermore, it strengthens the ability to identify and enforce fisheries laws.[36] More scientific understanding and data collection can improve global registries of vessels, as well as improve the economic efficiency through a better-designed enforcement system that is more capable when it comes to coping with changing circumstances.[37] It can, for example, enhance identification of broad-scale trends in fishery biomass.[38]

On all levels – regional, national, and global – cooperation has to be enhanced in order to increase enforcement capabilities. An important step in this direction is linking regional, national, and global registries.[39] Moreover, more global cooperation in financial matters is needed to ensure that developing countries are not primarily burdened with enforcement in the Indian Ocean. Creating a new network for improving existing resources, drawing on experiences such as the International Monitoring Control and Surveillance (MCS) Network for fisheries-related activities which operates across national borders or the Fisheries Support Unit, can enhance collaboration on fisheries issues throughout the Indian Ocean region in terms of monitoring and enforcement.[40]

Such a network or unit is essential to create overarching MCS programs and bolster scientific analysis in coastal states. The FSU, for example, brings states together in support of fisheries management and conservation. Furthermore, it seeks to share knowledge, build capacities of member states and address strategic issues facing fisheries throughout the Indian Ocean. However, the design of such a network should take account of the challenges that the FSU currently faces. For instance, the network should be well integrated into other organisations in the Indian Ocean, including IOTC, SIOFA, and IORA. Moreover, it should be able to undertake significant Indian Ocean-wide research and MCS programs.

Moreover, for such a network or unit to be efficient in the long term, involvement of the private sector is crucial. Active business sector participation leads to a more comprehensive set of data, which enables the scientific underpinning of the envisioned sustainable fishing practices. Consequently, this scientific basis forms a solid basis for both private and state actors to support blue growth and sustainable development. Based on the above, recommendations for monitoring and enforcement measures are:

- **Uniform standards for fishery-dependent data collection and reporting:** with the coordinating role of a network or unit, states and non-state actors must commit themselves to additional data collection, improved data sharing, and scientific analyses concerning fishing activities in the region to monitor and adaptively improve cooperation and governance.
- **Linking registries to enhancement of regional, global and national cooperation:** regional, national and global registries must be linked, also to induce compliance by vessel operations.
- **A network or unit as key resource to deliver overarching MSC programs:** to bring states and non-state actors together in order to share knowledge, create a solid scientific basis for policy-making, to build capacity and address strategic issues.

Conclusion

This policy brief focused on instruments, policies, and partnerships that can enhance blue growth and sustainable development in the governance of the Indian Ocean, in particular regarding sustainable fishing practices. These changes are essential for economic growth in the region, as well as food security, healthy and preserved fish stocks, biodiversity, and as part of wider climate change mitigation efforts. With a view to enhancing the blue growth potential of this region, three sets of recommendations emerge from this analysis, which can be summarized as follows:

- *Introduction of Marine Protected Areas:* Ecosystem and fish stock conservation can be facilitated by establishing "no-take" or highly protected areas in the high seas of the Indian Ocean. Preferably, the introduction of MPAs is done in the framework of Marine Spatial Planning. Objectives of MPAs need to be clearly defined and their social implications need to be examined before implementation.
- *Improvements to the current governance framework:* A number of adjustments to existing treaties are needed in order to increase coverage and empower important stakeholders. Moreover, an overarching framework agreement can serve as a dome for a comprehensive treaty-system that is both geographically inclusive and wide-ranging in terms of the species. In addition, disadvantaged stakeholders should be empowered and private actors and the scientific community should be involved in order to make long-term sustainable fishing attainable.
- *A framework for monitoring and enforcement:* More effective monitoring, control and surveillance of fisheries agreements can be attained by enhancing the current set of instruments. To this end, improvements in scientific research capabilities and information sharing, a set of uniform standards for data collection and reporting, and the selection (or creation) of a network or third party organisation fit to oversee such standards are required.

These actions would be strengthened by an environment of inclusive cooperation with relevant stakeholders in the Indian Ocean. This entails reaching out to non-profit organisations, scientific and local communities, and businesses to use their often highly relevant networks and experience. Moreover, by providing both financial and technical support, a governance landscape can be shaped in which developing states can more effectively participate and capacities can be jointly developed.

The proposals described above address the most important obstacles to sustainable development and blue growth in the Indian Ocean. They are intertwined with each other and they are dependent upon a supportive policy environment. An overarching, inclusive, and effective Indian Ocean governance architecture remains an ambitious, long-term goal, but significant steps in that direction, which will also yield short-term benefits, can be taken by following these recommendations. First measures to pave the way include setting up regional seas conventions and other partnerships to ultimately establish MPAs in ABNJ, welcoming new members to existing arrangements such as SIOFA or IOTC, and agreeing on shared monitoring standards. Meanwhile, it is important to continue exploring opportunities for cooperation, in order to reach a common understanding and shared goals for turning Indian Ocean governance from a patchwork of actors, treaties, and institutions into a shared catalyst for blue growth.

Endnotes

1 | Global Ocean Commission, "From Decline to Recovery: A Rescue Package for the Global Ocean", Report Summary (2014), 13.

2 | Coastal (or riparian) states of the Indian Ocean include key actors such as India, Australia, Indonesia, and South Africa, least developed countries such as Somalia, Mozambique and Timor-Leste, as well as EU Member State France (through Mayotte, La Réunion, and the French Southern and Antarctic Lands).

3 | Declaration of the Indian Ocean Rim Association on enhancing Blue Economy Cooperation for Sustainable Development in the Indian Ocean Region, Mauritius, September 2–3, 2015.

4 | In the Indian Ocean region, existing, specialized arrangements include the Indian Ocean Tuna Commission (IOTC), the South Indian Ocean Fisheries Agreement (SIOFA), the Southwest Indian Ocean Fisheries Commission (SWIOFC), and IORA's Fisheries Support Unit (FSU). In addition, relevant agreements and mechanisms on a global scale include the United Nations Convention on the Law of the Sea (UNCLOS), the United Nations Fish Stocks Agreement (UNFSA), the Convention on Biological Diversity (CBD), and the International Union for Conservation of Nature (IUCN). Other oceans, or parts thereof, have similar organizations, e.g. the Western and Central Pacific Fisheries Commission (WCPFC), the Inter-American Tropical Tuna Commission (IATTC), and the Convention for the Protection of the Marine Environment of the North-East Atlantic (known as the OSPAR Convention).

5 | Indian Ocean Commission, "Network of MPA Managers of countries of the IOC", accessed July 15, 2016, *http://www.commissionoceanindien.org/archives/environment.ioconline.org/marine-protected-areas.html*

6 | Ibid.

7 | See Ussif Rashid Sumaila, Dirk Zeller, Reg Watson, Jackie Alder, and Daniel Pauly, "Potential costs and benefits of marine reserves in the high seas", Marine Ecology Progress Series, Vol. 345 (2007): 305-310.

8 | Detail from the map provided by Marine Conservation Institute, "MPAtlas," accessed February 5, 2017, *http://www.mpatlas.org/explore/*

9 | This definition was adopted at the World Conservation Congress of the International Union for Conservation of Nature (IUCN) in 2008. "Marine protected areas – Why do we need them?" International Union for Conservation of Nature, February 9, 2010, accessed January 16, 2017, *http://www.iucn.org/content/marine-protected-areas-%E2%80%93-why-do-we-need-them*

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12 | A. Hastings and L. W. Bostford, "Equivalence in yield from marine reserves and traditional fisheries management," Science 284 (1999): 1537-1538.

13 | Graeme Kelleher, "The importance of regional networks of Marine Protected Areas and how to achieve them" (2015), 6, accessed June 19, 2016, *https://www.iucn.org/sites/dev/files/import/downloads/gkelleher_the_importance_of_regional_networks_of_marine_protected_areas__mpas__finala.pdf*

14 | Decision Adopted by the Conference of the Parties to the Convention on Biological Diversity at Its Seventh Meeting, UNEP/CBD/COP/DEC/VII/28, 13 April 2004, pt. 18.

15 | Marine Conservation Institute, "MPAtlas," accessed February 9, 2017, *http://www.mpatlas.org/explore/*

16 | B.C. O'Leary, R.L. Brown, D.E. Johnson, H. von Nordheim, J. Ardron, T. Packeiser and C.M. Roberts, "The first network of marine protected areas (MPAs) in the high seas: the process, the challenges and where next," Marine Policy, Vol. 36, No.3 (2012): 598-605.

17 | Ibid.

18 | Linwood Pendleton and Michelle Lotker, "Enabling Conditions and Outstanding Challenges in Marine Protection and Management," Policy brief, Nicholas Institute for Environmental Policy Solutions (2013), accessed July 5, 2016, *https://nicholasinstitute.duke.edu/sites/default/files/publications/ni_pb_13-02_0.pdf*

19 | "Marine Spatial Planning," UNESCO, last updated April 12, 2016, accessed July 29, 2016, *http://www.unesco-ioc-marinesp.be/marine_spatial_planning_msp*

20 | Niko Soininen and Daud Hassan, "Marine spatial planning as an instrument of sustainable ocean governance," in Transboundary Marine Spatial Planning and International Law, ed. Daud Hassan, Tuomas Kuokkanen and Niko Soininen (New York: Routledge, 2015), 4-5.

21 | Claire van der Geest, "Redesigning Indian Ocean Governance for the 21st Century to Account for a Changing Climate" (paper prepared for the Oceans Governance Conference, The Hague, March 31 – April 1, 2016).

22 | Detail from the map provided by The Pew Environment Group, High Seas Fisheries Management Gets Low Marks, Ocean Science Series Research Summary, May 2010, 2.

23 | Current SIOFA members are: Australia, Comoros, Cook Islands, EU, France (on behalf of its overseas territories), Japan, Korea, Mauritius, and Seychelles. SIOFA's area of competence includes the high seas south of 10 degrees North in the far western Indian Ocean, at the equator in the central Indian Ocean and 20 degrees South in the eastern Indian Ocean.

24 | IOTC membership includes, among others, Australia, Belize, China, Comoros, Eritrea, European Union, France (on behalf of its overseas territories), Guinea, India, Indonesia, Iran, Japan, Kenya, Korea, Madagascar, Malaysia, Maldives, Mauritius, Mozambique, Oman, Pakistan, Philippines, Seychelles, Sierra Leone, Somalia, South Africa, Sri Lanka, Sudan, Tanzania, Thailand, UK (on behalf of its overseas territories) and Yemen.

25 | Eritrea is not a member of UNCLOS; Iran and the United Arab Emirates have signed, but not ratified the treaty.

26 | Global Ocean Commission, "From Decline to Recovery", 17.

27 | IORA has 21 Member States, but Pakistan and Myanmar are not among them.

28 | Final Communiqué, 14th Meeting of the Council of Ministers of the Indian Ocean Rim Association, Perth Communiqué, October 9, 2014.

29 | See Michael W. Lodge et al., "Recommended Best Practices for Regional Fisheries Management Organizations" (London: Chatham House, 2007), 127, accessed January 27, 2017, *https://www.oecd.org/sd-roundtable/papersandpublications/39374297.pdf*

30 | See also Hampus Eriksson et al., "Governance structures and sustainability in Indian Ocean sea cucumber fisheries", Marine Policy, Vol. 56 (2015): 21.

31 | van der Geest, "Redesigning Indian Ocean Governance", 7.

32 | Kristina M. Gjerde, et al., "Ocean in peril: reforming the management of global ocean living resources in areas beyond national jurisdiction", Marine Pollution Bulletin, Vol. 74, No. 2 (2013): 540–551.

33 | See already William T. Burke and Francis T. Christy, "Options for the management of tuna fisheries in the Indian Ocean", FAO Fisheries Technical Paper No. 315 (1990): 34.

34 | van der Geest, "Redesigning Indian Ocean Governance", 10.

35 | Natalie Ban et al., "Systematic Conservation Planning: A Better Recipe for Managing the High Seas for Biodiversity Conservation and Sustainable Use", Conservation Letters, Vol. 7, No. 1 (2014): 47-48; and Mary Ann Palma, Martin Tsameny and Willam Edeson, Promoting sustainable fisheries: The international legal and policy framework to combat illegal, unreported and unregulated fishing (Leiden: Nijhoff, 2010), 34.

36 | van der Geest, "Redesigning Indian Ocean Governance", 10–11.

37 | Palma, Tsameny and Edeson, Promoting sustainable fisheries, 35; see also Gjerde et al., "Ocean in peril".

38 | van der Geest, "Redesigning Indian Ocean Governance", 11.

39 | Palma, Tsameny and Edeson, Promoting sustainable fisheries, 36–37.

40 | See Clive Schofield, "Competing Claims to Maritime Jurisdiction in the Indian Ocean: Implications for Regional Marine Biodiversity," in Fisheries Exploitation in the Indian Ocean: Threats and Opportunities, ed. Dennis Rumley, Sanjay Chaturvedi, Vijay Sakhuja (Singapore: IORG/ISEAS, 2009), 128; Lee Cordner, "Indian Ocean Maritime Security Cooperation Needs Coherent Indian Leadership", Journal of Defence Studies, Vol. 8, No. 3 (2014): 31-56; and Gjerde et al. "Ocean in peril".

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