

A REGIONAL MARINE SPATIAL PLANNING STRATEGY FOR THE WESTERN INDIAN OCEAN

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Acronyms and Abbreviations

ABNJ	Areas Beyond National Jurisdiction (~high seas)
AEO	African Economic Outlook
AIMS	Africa's Integrated Maritime Strategy
AMCEN	African Ministerial Conference on the Environment
APP	Africa Progress Panel
ASCLME	Agulhas and Somali Current Large Marine Ecosystem
AU	African Union
AUC	African Union Commission
AU-IBAR	African Union – Inter-African Bureau for Animal Resources
BAU	Business as usual
CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species
CMR	Institute for Coastal and Marine Research, Nelson Mandela University
CORDIO	Coastal Oceans Research and Development in the Indian Ocean
CRM	Coastal Resource Management
CSIR	Council for Scientific and Industrial Research
EBA	Ecosystem-based Approach
EBSA	Ecologically and Biologically Significant Areas
EEZ	Exclusive Economic Zone
ENSO	El Nino Southern Oscillation
EU	European Union
GDP	Gross Domestic Product
GEF	Global Environment Facility
IBA	Important Bird and Biodiversity Areas
ICZM	Integrated Coastal Zone Management
IMMA	Important Marine Mammal Areas
IOC	Indian Ocean Commission
IOC-UNESCO	Inter-Governmental Oceanographic Commission of UNESCO
IOD	Indian Ocean Dipole
IOM	Integrated Ocean Management
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for the Conservation of Nature
IUU	Illegal, Unreported and Unregulated
LBSA	Land-based sources and activities
LDC	Least Developed Countries
GEF LME: LEARN	Global Environment Facility Large Marine Ecosystems: Learning Exchange & Resource Network
LME	Large Marine Ecosystems
LMMA	Locally Managed Marine Area
MARPOL	International Convention for the Prevention of Pollution from Ships
MEL	Monitoring, Evaluation and Learning
MMO	Marine Management Organisation
MPA	Marine Protected Area
MSP	Marine Spatial Planning

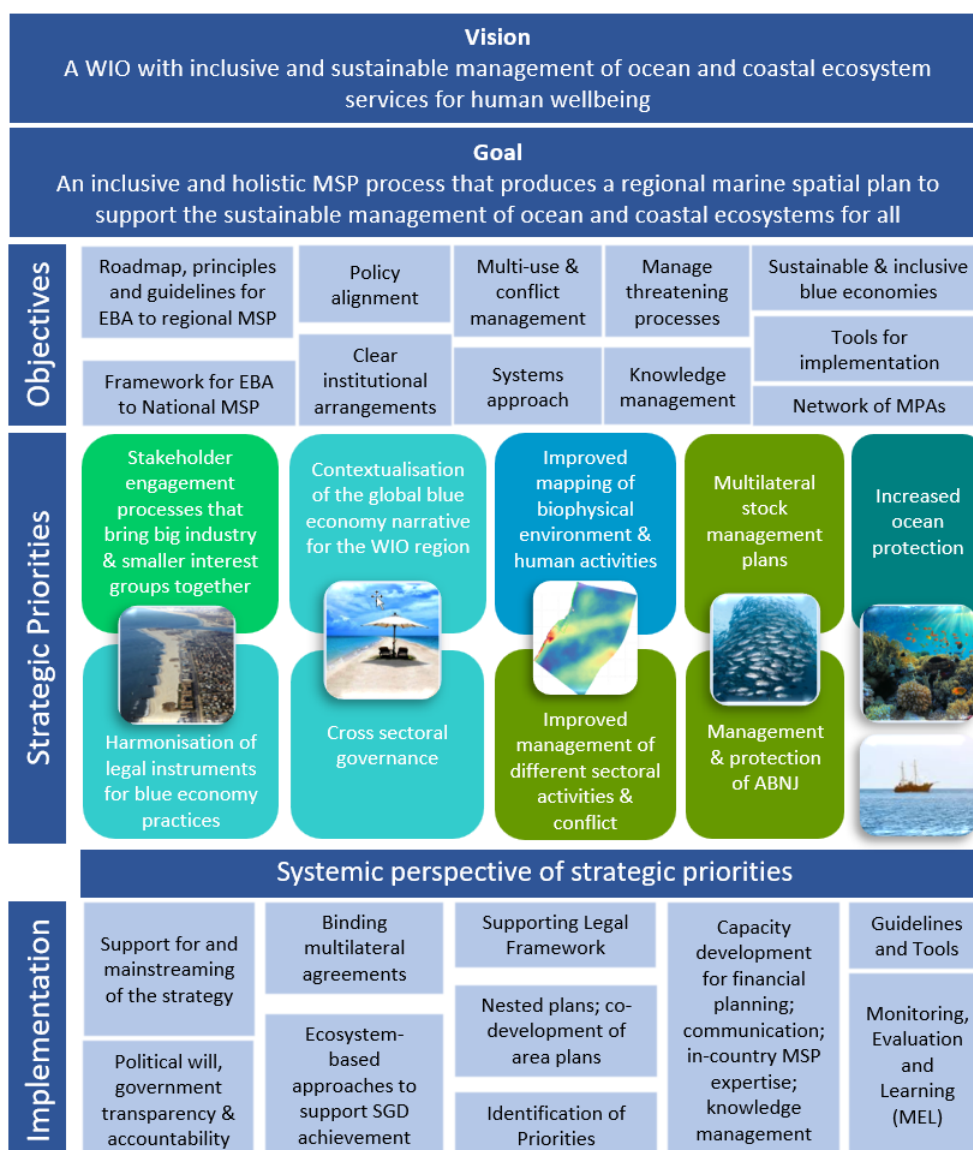
NC	Nairobi Convention
NGO	Non-governmental Organization
NMU	Nelson Mandela University
OBSA	Ocean-based sources and activities
OECD	Other Effective area-based Conservation Measures
PSSA	Particularly sensitive sea areas
SADC	Southern African Development Community
SAP	Strategic Action Programme
SAPPHIRE	Strategic Action Programme Policy Harmonization and Institutional Reforms
SDG	Sustainable Development Goal
SEEA	System of Environmental-Economic Accounting
SIDS	Small Island Developing States
SNA	System of National Accounts
SST	Sea Surface Temperature
SWIOFish	South West Indian Ocean Fisheries Governance and Shared Growth Project
SWIOFP	South Western Indian Ocean Fisheries Project
TDA	Transboundary Diagnostic Analysis
TWG	Technical Working Group
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change
VMCA	Voluntary Marine Conservation Areas
VME	Vulnerable Marine Ecosystems
WIO	Western Indian Ocean
WIO-C	Consortium for the Conservation of the Coastal and Marine Ecosystems of the Western Indian Ocean
WIO-LaB	Project for Addressing Land-based Activities in the Western Indian Ocean
WIOMER	Western Indian Ocean Marine Ecoregion Programme
WIOMSA	Western Indian Ocean Marine Science Association
WIO-SAP	Western Indian Ocean Strategic Action Programme
WWF	World Wide Fund for Nature

Preface/Foreword

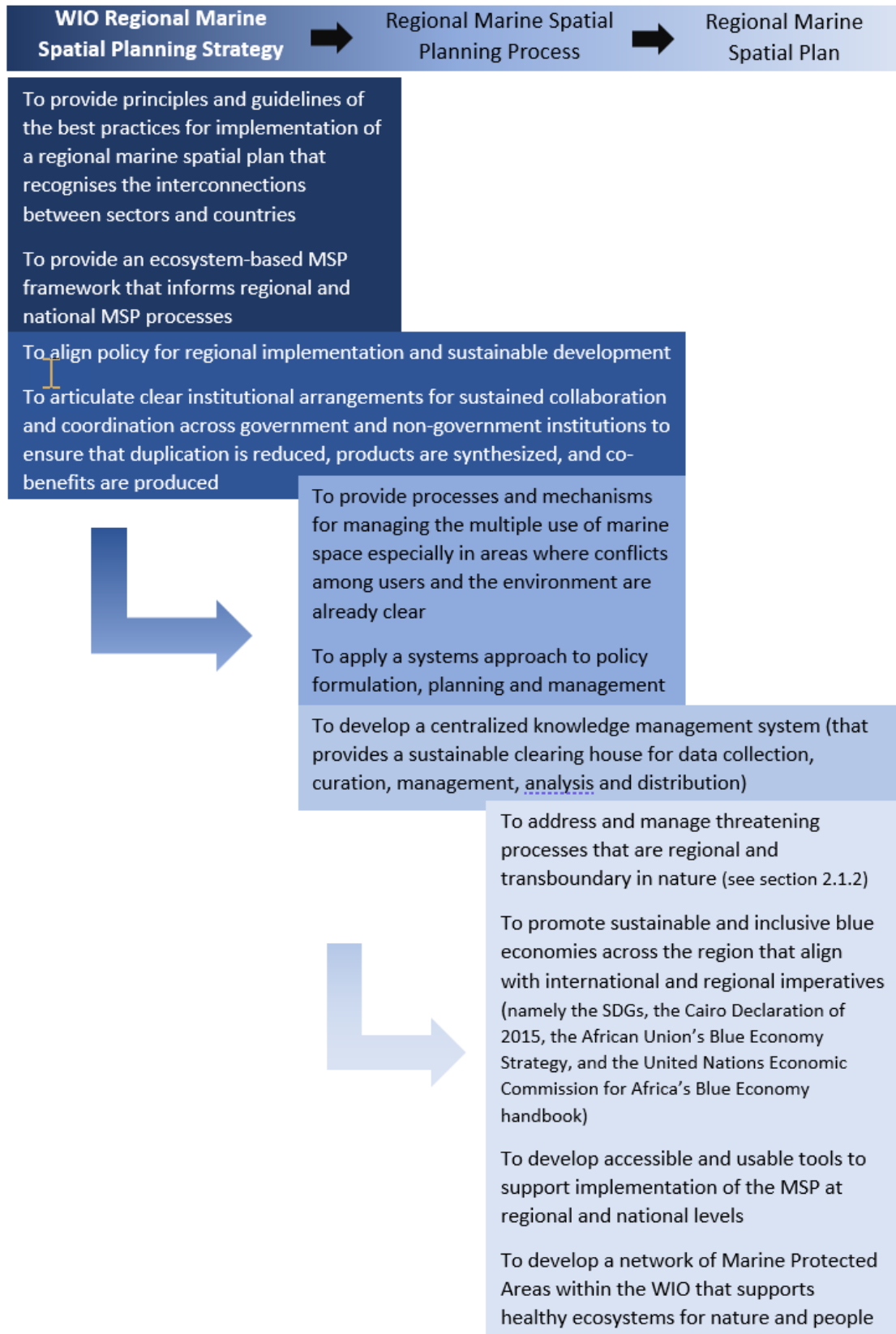
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Executive summary

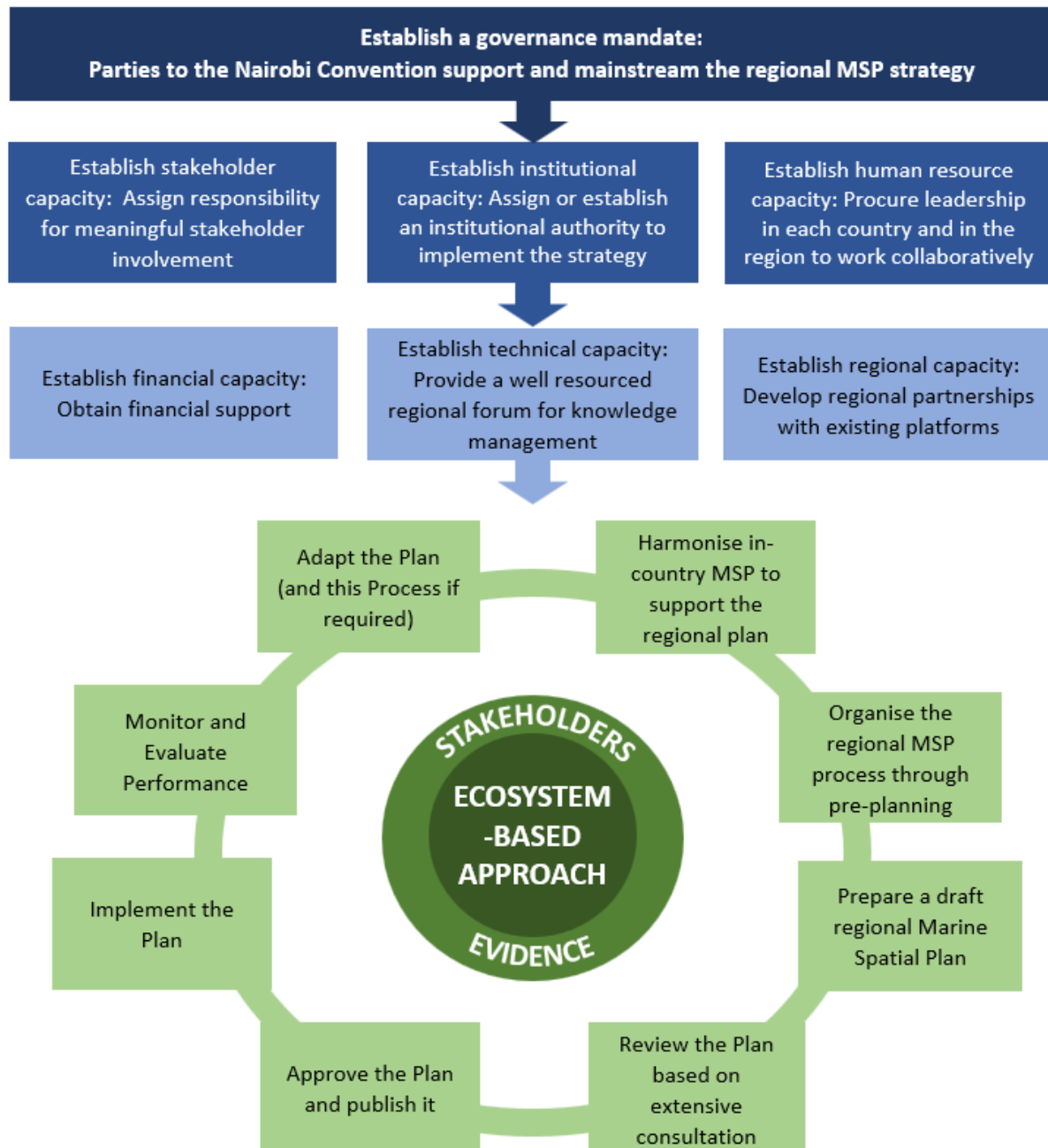
In response to regional challenges to the management of human activities and marine resources in the Western Indian Ocean (WIO), as well as the fast tracking of marine spatial planning (MSP) and blue economy initiatives globally, parties to the Nairobi Convention requested in March 2019 that a regional MSP strategy be developed for the WIO. This request was also in line with major outcomes of the Strategic Action Programme Policy Harmonization and Institutional Reforms (SAPPHIRE) and Western Indian Ocean Strategic Action Programme (WIO-SAP) Projects and recognizes that a regional MSP strategy is vital to harmonize the different marine and coastal management and spatial planning initiatives in the countries of the WIO region. During 2020-2021, this regional MSP strategy was developed with input from the MSP Technical Working Group (TWG) and wider stakeholders (invited through a public participation process). In keeping with global best-practice, the strategy adopts an ecosystem-based approach to MSP, and based on eight guiding principles, defines a vision, a goal and 11 objectives. Nine strategic priorities are identified, to be addressed with a systems thinking approach. This approach is currently novel in MSP strategies and holds promise for regional decision-making for healthy oceans and people. Ten enabling mechanisms for implementation are provided. A structural summary of the strategy is provided in the diagram below.



This regional strategy addresses step one of a three step process. These steps are: (1) Develop a regional marine spatial planning strategy; (2) Begin a regional marine spatial planning process; and (3) Develop a regional marine spatial plan. The 11 objectives defined above can be mapped to these three steps as follows:



Based on global best practice and TWG and stakeholder input into this strategy, the following steps are recommended for an ecosystem-based regional MSP process for the WIO (see Figure below). Evidence-based decision-making and meaningful stakeholder involvement are at the core of the process. A systems thinking approach is recommended to mainstream evidence-based recommendations into policy formulation and decision making.



Recognising that countries of the WIO are at different stages and have different priorities with regards to MSP, both strategic and technical recommendations are provided as follows:

Strategic Recommendations (Actions for the parties to the Nairobi Convention). Contracting parties are encouraged to:

- Support and mainstream this marine spatial planning strategy to achieve improved governance of the WIO.
- Harmonise in-country MSP development in support of regional marine ocean use and planning, without compromising national MSP processes.
- Adopt an ecosystems-based approach to MSP, according to the “Malawi Principles” and the IOI-UNESCO steps.
- Secure funding and develop capacity for regional and in-country MSP.
- Develop regional partnerships with regional economic communities (e.g., SADC), regional fisheries management organizations and other regional bodies and commissions (e.g. the IOC).

Technical Recommendations (Actions for the MSP Technical Working Group). The technical working group is encouraged to:

- Provide a platform for shared learning and promote regional best practice.
- Promote an enabling policy environment for the development of in-country MSP legislation.
- Assist with establishing in-country cross-sectoral forums/committees/working groups to provide integration of sectoral policies and assist with the MSP process.
- Develop in-country knowledge management systems that contribute to, and benefit from, a regional knowledge management system.
- Develop a communication and stakeholder engagement plan to ensure co-development and support for regional and national area plans.
- Support capacity development within and between countries to support strategy implementation.

1 Introduction

“The Western Indian Ocean (WIO) region, also referred to as the Nairobi Convention area, is composed of Comoros, France (Reunion), Kenya, Madagascar, Mauritius, Mozambique, Seychelles, Somalia, South Africa and Tanzania, who are also parties to the Nairobi Convention¹. Over 60 million people in the WIO islands and Eastern Africa coastal communities rely on the coastal and marine environment for goods and services. Coastal and island communities are largely dependent on fishing, shipping and tourism for their livelihoods. Yet the natural resources that provide sustainable livelihoods and fuel economic activity are already under pressure from threats such as poverty, overfishing, overdevelopment, pollution, and environmental degradation. The impacts of climate change are exacerbating these problems and are already presenting mounting challenges to the sustainable development of the region as evidenced by widespread coral reef bleaching (with limited recovery), prolonged droughts, sea level rise and flooding/sedimentation which have significant potential to retard economic growth and slow realization of respective national development targets including the Sustainable Development Goals (SDGs)”².

“The importance of the ocean to the people of the WIO region cannot be overstated. Over a quarter of the population, some 60 million people, lives within 100km of the shoreline and cultures based on fishing, maritime trade and marine resource use go back hundreds of years. Today, healthy ocean and coastal ecosystems underpin the economies of the region and offer huge potential for sustainable development. However, the region could suffer severe losses if current pressures on the ocean are not alleviated....the natural capital of the Western Indian Ocean region is being eroded, undermining the ocean’s value for present and future generations”³.

¹ The Nairobi Convention is a partnership between governments, civil society and the private sector, working towards a prosperous WIO Region with healthy rivers, coasts and oceans (<https://www.nairobiconvention.org/>)

² UNEP (United Nations Environment Programme), 2017. Concept Note to the Green Climate Fund: Transition to a Resilient Blue Economy in the Western Indian Ocean Region. https://wedocs.unep.org/bitstream/handle/20.500.11822/25678/WIO-ResilienceP_to_CC_2018.pdf?sequence=1&isAllowed=y

³ Obura, D., Smits, M., Chaudhry, T., McPhillips, J., Beal, D. and Astier, C., 2017. Reviving the Western Indian Ocean economy: actions for a sustainable future. World Wide Fund for Nature (Formerly World Wildlife Fund), Gland, Switzerland, pp.1-63.

CALL TO ACTION

“The Western Indian Ocean can still count relatively healthy ocean assets amongst its greatest values, at a time when marine and coastal habitats have been highly degraded in much of the world. For centuries, the region’s ocean assets have supported the cultures, traditions and livelihoods of its communities. Now, the considerable and growing economic and social benefits drawn from the ocean are becoming increasingly undermined by the intensifying pressures imposed on them.

60 million people already live in coastal areas in this region, and the population is projected to grow strongly. Managing the local and global demands on limited ocean resources, and securing these assets so that they continue to provide shelter, food, livelihoods and jobs, will be essential to the stability and sustainable future of the region.

There can be no healthy economic future for the countries of the Western Indian Ocean without protecting and restoring ecosystems and habitats that underpin industries like sustainable fishing and tourism. This report is a call to leaders within and outside the region to act together – with a strong sense of urgency – to take the necessary, tangible steps towards an inclusive, sustainable blue economy, in the interest of the people of the region and the environment that supports them.”

Obura *et al.*, 2017.

In response to this call for action, as well as the fast tracking of marine spatial planning (MSP) and blue economy initiatives globally, parties to the Nairobi Convention requested in March 2019 that a regional MSP strategy be developed for the WIO. This request was also in line with major outcomes of the SAPPHIRE⁴ and WIO-SAP⁵ Projects and recognizes that a regional MSP strategy is vital to harmonize the different marine and coastal management and spatial planning initiatives in the countries of the WIO region.

Supplementary material that explains the development of this strategy document is supplied in a separate Situational Report⁶ that covers a preliminary assessment of the context of MSP at a national and regional level in the WIO, key challenges for MSP in the WIO, the status and opportunities for MSP, latest updates towards MSP implementation and the identification of knowledge and data gaps and priorities.

1.1 Definition of MSP

The Intergovernmental Oceanographic Commission (IOC) of UNESCO defines Marine Spatial Planning (MSP) as follows: “MSP is a process of analyzing and allocating parts of three-dimensional marine spaces (or ecosystems) to specific uses or objectives, to achieve ecological, economic, and social

⁴ <https://www.unep.org/nairobiconvention/projects/western-indian-ocean-large-marine-ecosystems-sapphire>

⁵ <https://www.nairobiconvention.org/nairobi-convention-projects/implementation-of-the-strategic-action-programme-for-the-protection-of-the-western-indian-ocean-from-land-based-sources-and-activities-wiosap/>

⁶ UNEP (United Nations Environment Programme)–Nairobi Convention, WIOMSA, Nelson Mandela University, and Macquarie University, 2021. Towards the development of a marine spatial planning strategy for the Western Indian Ocean region: Situational Report. UNEP-Nairobi Convention, WIOMSA, Nelson Mandela University, and Macquarie University, 100 pp.

objectives that are usually specified through a political process. MSP is a process that is: ecosystem-based (balancing ecological, economic, and social goals and objectives toward sustainable development); integrated across economic sectors and among governmental agencies; place-based or area-based; adaptive (capable of learning from experience); strategic and anticipatory (focused on the long-term); and participatory, with stakeholders actively in the process” (<http://msp.ioc-unesco.org/about/msp-facts/>).

The Nairobi Convention specifically calls for the development of a regional MSP strategy to better cooperate on governing Areas Beyond National Jurisdiction (ABNJ) and coordinating blue economy pathways in the WIO (decision CP8/10). The Nairobi Convention further urges contracting parties to develop and implement ecosystem-based management approaches in the Exclusive Economic Zones (EEZs). The Western Indian Ocean Marine Spatial Planning Strategy (WIO MSP, this document) is thus founded on an ecosystem-based approach (EBA), which can be traced back to the Convention on Biological Diversity and the twelve Malawi Principles⁷ (discussed later). An EBA is underpinned by sound science, a precautionary approach and a commitment to adaptive and inclusive management, bringing in stakeholder expertise from an early stage⁸. It is defined in this strategy as an interdisciplinary management approach that acknowledges the complex nature of ecological systems and integrates social, ecological, and governance principles to achieve sustainable use of natural resources in an equitable way⁹.

1.2 *The benefits of a regional MSP strategy*

The primary challenge in the WIO is the erosion of the region’s natural capital. A regional strategy needs to address this and provide guidance on mechanisms to secure the value of coasts and ocean for present and future generations. Many human pressures (e.g. unsustainable fishing, pollution, maritime security) are transboundary in nature, and national and sectoral approaches are unable to address them. The main purpose of this regional strategy is thus to support the region to address transboundary and cross-sectoral marine management challenges, with a focus on MSP as an approach to promote a healthy social-ecological system in the coasts and oceans of the WIO. Holistic and integrated ocean management, however, is not restricted to spatial planning, thus MSP should operate alongside other management mechanisms and tools that address the temporal nature of marine ecosystem services (for example, fisheries management and climate change adaptation).

Most of the WIO region falls within two Large Marine Ecosystems (LMEs): the Somali Current LME and the Agulhas Current LME¹⁰. The region also includes ABNJs. Management of a vast and diverse ocean space with fragmented ocean governance remains one of the main challenges of achieving sustainable development and effective marine and coastal management in the region¹¹. Furthermore, marine physical and ecological processes typically occur at regional scales and do not adhere to political and

⁷ <https://www.cbd.int/ecosystem/principles.shtml>

⁸ World Wide Fund for Nature (WWF), 2017. Delivering ecosystem-based marine spatial planning in practice: An assessment of the integration of the ecosystem approach into UK and Ireland Marine Spatial Plans, pp.1-132.

⁹ Domínguez-Tejo, E., Metternicht, G., Johnston, E. and Hedge, L., 2016. Marine Spatial Planning advancing the Ecosystem-Based Approach to coastal zone management: A review. *Marine Policy*, 72, pp.115-130.

¹⁰ UNEP (United Nations Environment Programme)–Nairobi Convention and WIOMSA (Western Indian Ocean Marine Science Association), 2015. *The Regional State of the Coast Report: Western Indian Ocean*.

¹¹ Carneiro, G., Thomas, H., Olsen, S., Benzaken, D., Fletcher, S., Méndez Roldán, S. and Stanwell-Smith, D., 2017. Cross-border cooperation in Maritime Spatial Planning. Final Report. Service Contract: EASME/EMFF/2014/1.3.1.8/SI2.714082: Study on international best practices for cross-border Maritime Spatial Planning.

jurisdictional boundaries^{12,13}. These processes include oceanographic processes such as ocean currents (important for e.g. larval dispersal) and large frontal areas (important as productive feeding grounds¹⁴, as well as migratory marine species of which many are under threat, or targeted by commercial fisheries). These broad-scale processes are often dynamic and spatially extensive and will require joint management and cross-border cooperation to effectively conserve and protect the ecosystem services they deliver^{15,16,17}. An example of this includes the outcome of an initial assessment of sites in the WIO undertaken by the World Heritage Convention and CORDIO East Africa, which identified several sites for World Heritage site nomination. The sites included among others, the Mozambique Channel and the Mascarene Plateau both of which are transboundary sites in the Nairobi Convention area (see <https://whc.unesco.org/en/news/967>).

Natural and anthropogenic threats to these valuable marine species, pelagic and deep-sea benthic habitats and ecosystem processes are also not limited to national boundaries and occur across broad spatial and temporal scales^{18,19,20}. The main transboundary issues and challenges, as identified by the WIO-Lab²¹, UNDP/GEF ASCLME²², WIO-SAP²³ and SAPPHIRE²⁴ projects, are discussed in section 2.1. Similar issues were identified by the regional MSP Technical Working Group (TWG) and stakeholders identified throughout the development of this regional strategy; they emphasised the need for a centralised regional governing body that can facilitate the management of shared resources, a framework for standardised data collection and monitoring in the region, linking national and international stakeholders to facilitate shared learning, knowledge and capacity through experience and expertise and the development of legally binding policies that will support sustainable growth of a Blue Economy in the WIO.

The need for a regional MSP strategy was emphasized by the Parties to the Nairobi Convention and partners at a meeting to discuss MSP in the WIO held in Dar es Salaam in March 2019. This request was in line with major outcomes of the SAPPHIRE and WIO-SAP Projects and recognizes that a regional MSP strategy is vital to harmonize the different marine and coastal management and spatial planning

¹² Kark, S., Tulloch, A., Gordon, A., Mazor, T., Bunnefeld, N. and Levin, N., 2015. Cross-boundary collaboration: key to the conservation puzzle. *Current Opinion in Environmental Sustainability*, 12, pp.12-24.

<https://doi.org/10.1016/j.cosust.2014.08.005>

¹³ van Tatenhove, J.P., 2017. Transboundary marine spatial planning: a reflexive marine governance experiment? *Journal of Environmental Policy & Planning*, 19(6), pp.783-794.

<https://doi.org/10.1080/1523908X.2017.1292120>

¹⁴ Hyrenbach, K.D., Veit, R.R., Weimerskirch, H. and Hunt Jr, G.L., 2006. Seabird associations with mesoscale eddies: the subtropical Indian Ocean. *Marine Ecology Progress Series*, 324, pp.271-279.

¹⁵ Carneiro, et al., 2017.

¹⁶ GEF LME:LEARN, 2018. *Marine Spatial Planning Toolkit*. Paris, France.

¹⁷ UNEP (United Nations Environment Programme)–Nairobi Convention, 2020. *The State of Ocean Governance in the Western Indian Ocean*. Nairobi, Kenya.

¹⁸ Kark, et al., 2015.

¹⁹ UNEP–Nairobi Convention and WIOMSA, 2015.

²⁰ UNEP–Nairobi Convention, 2020.

²¹ UNEP (United Nations Environment Programme)–Nairobi Convention Secretariat, 2009. *Strategic Action Programme for the Protection of the Coastal and Marine Environment of the Western Indian Ocean from Land-based Sources and Activities*, Nairobi, Kenya, 140 pp.

²² ASCLME/SWIOPF, 2012. *Transboundary Diagnostic Analysis for the western Indian Ocean. Volume 1: Baseline*; ASCLME/SWIOPF, 2012b. *Transboundary Diagnostic Analysis of the Large Marine Ecosystems of the Western Indian Ocean*.

²³ <https://www.unep.org/nairobiconvention/resources/other/wio-sap-project-document>

²⁴ <https://www.unep.org/nairobiconvention/projects/western-indian-ocean-large-marine-ecosystems-sapphire>

initiatives in the countries of the WIO region. Moving away from the more traditional single-sector approach to managing marine resources and human activities, a regional approach to MSP can have added benefits by applying a broader perspective to some of the challenges associated with marine and coastal governance. A regional strategy will aim to harmonise policy and legislative structures towards a shared vision and common goals and objectives of an ecosystem-based approach to ocean management²⁵. These common overarching goals can then drive local MSP initiatives at a national scale. Using various tools and decision-making frameworks to assess trade-offs among sectors²⁶, a regional MSP strategy will be able to take a future-oriented approach²⁷ that can address conflicts among ocean users and to manage various human activities, especially as new sectors (e.g. marine renewable energy and mariculture) emerge in the development of the Blue Economy²⁸. A regional approach will be able to address issues in ABNJ and can assess trade-offs for activities that are transboundary in nature and that are likely to affect multiple countries, for example, shipping lanes²⁹, large offshore windfarms³⁰, fishing (mobile/migratory species), resource extraction and pollution^{31,32,33}. The UNEP-Nairobi Convention report³⁴ also emphasises the need for regional ocean governance to address emerging issues such as maritime safety and security, deep seabed mining and ocean acidification.

Given the broad spatial extents of marine species distributions, ecosystem service provisions, physical and ecological processes, as well as threatening processes, WIO countries have already established various intergovernmental institutions and partnerships (e.g. the Nairobi Convention and regional fisheries bodies) that can assist with the implementation of a regional MSP strategy, for example, by supporting and facilitating joint coordination and collaboration towards a common goal^{35,36}. A regional approach can provide a coordinated structure for knowledge and data sharing, incorporate broad stakeholder engagement and increase communication and collaboration with relevant organisations in the region. A more holistic approach where sectors and institutions interact and cooperate, is more

²⁵ UNEP–Nairobi Convention, 2020.

²⁶ White, C., Halpern, B.S. and Kappel, C.V. 2012. Ecosystem service tradeoff analysis reveals the value of marine spatial planning for multiple ocean uses. *Proceedings of the National Academy of Sciences*, 109(12), pp.4696-4701.

²⁷ Lukic, I., Schultz-Zehden, A., Ansong, J.O., Altvater, S., Przedzimirska, J. and Lazic, M. 2018. Multi-Use Analysis. Edinburgh: MUSES Project.

²⁸ African Union – Inter-African Bureau for Animal Resources (AU-IBAR), 2019. Africa Blue Economy Strategy. Nairobi, Kenya.

²⁹ Cameron, L., Hekkenberg, M. and Veum, K., 2011. Transnational maritime spatial planning: Recommendations. *Seanergy* 2020.

³⁰ Bonnevie, I.M., Hansen, H.S. and Schröder, L., 2021. Supporting integrative maritime spatial planning by operationalising SEANERGY—a tool to study cross-sectoral synergies and conflicts. *International Journal of Digital Earth*, 14(6), pp.678-695.

³¹ Levin, N., Beger, M., Maina, J., McClanahan, T. and Kark, S., 2018. Evaluating the potential for transboundary management of marine biodiversity in the Western Indian Ocean. *Australasian Journal of Environmental Management*, 25(1), pp.62-85.

³² UNEP–Nairobi Convention and WIOMSA, 2015.

³³ UNEP–Nairobi Convention, 2020.

³⁴ UNEP–Nairobi Convention, 2020.

³⁵ <http://msfd.eu/site/good-environmental-status/>

³⁶ UNEP–Nairobi Convention, 2020.

likely to deliver sustainable benefits for all^{37,38,39,40}. Regional cooperation has the potential to improve management efficiency, by addressing broad-scale threats (i.e. joint cross-country efforts for monitoring and surveillance), prioritising conservation efforts in a cost-effective way, securing joint international funding and shared access to knowledge, data and technical capacity (see Kark et al.⁴¹ for more details and examples). A regional MSP strategy will be able to support these joint initiatives, encourage cross-border cooperation and provide guidelines to achieve the overarching goals for the WIO. However, successful implementation of sustainable development and planning will still rely heavily on the countries' ability to implement MSP in their national context. Many additional documents^{42,43,44,45,46,47,48,49,50} discuss the main benefits that a regional MSP strategy can provide (as summarised in the text box below).

³⁷ African Union, 2012. 2050 Africa's Integrated Maritime Strategy (2050 AIM Strategy), Available at: www.au.int/maritime

³⁸ Wright, G., Schmidt, S., Rochette, J., Shackeroff, J., Unger, S., Waweru, Y. and Müller, A., 2017. Partnering for a sustainable ocean: The role of regional ocean governance in implementing SDG14. PROG: IDDRI, IASS, TMG & UN Environment.

³⁹ AU-IBAR, 2019.

⁴⁰ UNEP–Nairobi Convention, 2020.

⁴¹ Kark, et al., 2015.

⁴² ASCLME/SWIOPF, 2012. TDA. Volume 1: Baseline; ASCLME/SWIOPF, 2012. TDA of the Large Marine Ecosystems of the WIO.

⁴³ Kark, et al., 2015.

⁴⁴ Lagabrielle, E., 2012. Assembling data for coastal and marine spatial planning in the Western Indian Ocean Section I: Pelagic bioregionalisation. Prepared for the ASCLME/Agulhas Somali Current Large Marine Ecosystem project, GEF/UNDP/UNOPS.

⁴⁵ Carneiro, et al., 2017.

⁴⁶ GEF LME:LEARN, 2018.

⁴⁷ Levin, et al., 2018.

⁴⁸ Lombard, A.T., Dorrington, R.A., Reed, J.R., Ortega-Cisneros, K., Penry, G.S., Pichegru, L., Smit, K.P., Vermeulen, E.A., Witteveen, M., Sink, K.J. and McInnes, A.M., 2019. Key challenges in advancing an ecosystem-based approach to marine spatial planning under economic growth imperatives. *Frontiers in Marine Science*, 6, p.146.

⁴⁹ Wright, G., Gjerde, K.M., Johnson, D.E., Finkelstein, A., Ferreira, M.A., Dunn, D.C., Chaves, M.R. and Grehan, A., 2019. Marine spatial planning in areas beyond national jurisdiction. *Marine Policy*, p.103384.

⁵⁰ UNEP–Nairobi Convention, 2020.

Benefits of regional and transboundary marine spatial planning

- Increased resilience of the region's social-ecological system to climate change and unpredictable environmental events (e.g. sea level rise, ocean warming)
- Effective management of complex marine ecosystems and processes and their interconnectedness
- Effective management of migratory marine species
- A reduction of overexploitation and better management of shared living resources
- Improved understanding of regional ecosystem service provision, especially the nexus between population growth, climate change and food security
- A reduction of habitat and biological community modification
- Improved water quality management
- Mitigation and reduction of pressures, in particular from pollution (including from ships, dumping, land-based activities, transboundary movement of hazardous waste and other sea-based activities, and from shipping, seabed mining and engineering activities)
- Effective management of conflicts between ocean users (especially with the development of new "blue" sectors)
- Improved monitoring and data collection for broad-scale ecological ecosystems and processes
- Conservation of ABNJ
- Improved maritime safety and security

1.3 Rationale

Building on the intensive work that has already described and assessed the state of the ecological and socio-economic conditions in the WIO, this regional strategy provides guidance for a MSP process that addresses regional concerns that cannot be dealt with by nations operating alone. It is intended to complement national MSP strategies (that are at different stages in the countries of the WIO). It is thus positioned within a governance structure that draws from and supports both International, and National, law and policy (Figure 1). It also provides guidance and example templates for countries to follow (see section 10) as they develop their own national marine spatial plans.



Figure 1. The position of a regional MSP strategy in the Governance structure of the Western Indian Ocean.

Existing policies and strategies do not specifically address MSP. The text boxes below list examples of some of the most relevant global and regional policies and strategies that can inform regional MSP.

Global scale

Source	Title	Reference/Link
United Nations (UN) Environment	Realizing Integrated Regional Oceans Governance	UN Environment, 2017. Realizing Integrated Regional Oceans Governance – Summary of case studies on regional cross-sectoral institutional cooperation and policy coherence.
UN Environment Programme (UNEP)	The Other 70%. UNEP Marine and Coastal Strategy	United Nations Environment Programme, 2011. The Other 70%. UNEP Marine and Coastal Strategy. Kenya.
	2019 Proposal for a new Marine and Coastal Strategy of UN Environment Programme for 2020-2030	https://wedocs.unep.org/

Continental scale

Source	Title	Reference/Link
African Union	Africa's Integrated Maritime Strategy 2050 (AIMS)	African Union, 2012. 2050 Africa's integrated maritime strategy (2050 AIM Strategy). https://au.int/en/documents-38 .
	Africa Blue Economy Strategy	AU-IBAR, 2019. Africa Blue Economy Strategy. Nairobi, Kenya.
African Union Commission	Agenda 2063. The Africa we want	AUC, 2015. Agenda 2063 report of the commission on the African Union Agenda 2063 The Africa we want in 2063. www.agenda2063.au.int
African Union, UNEP	African Strategy for Ocean Governance	https://wedocs.unep.org/handle/20.500.11822/26930

Regional scale (Agulhas-Somali Current Large Marine Ecosystem Area)

Source	Title	Reference/Link
UN Development Programme	Transboundary Diagnostic Analysis (TDA) of the Large Marine Ecosystems of the western Indian Ocean	https://asclme.org/TDA/ASCLME_SWIOFP_TDA_Vol2_Electronic.pdf
	A Strategic Action Programme (SAP) for Sustainable Management of the Western Indian Ocean Large Marine Ecosystems	https://asclme.org/SAP/Final%20SAP%20English%20131007.pdf

Regional scale (Nairobi Convention Area)

Source	Title	Reference/Link
Nairobi Convention	Climate Change Strategy for the Nairobi Convention	Nairobi Convention, 2016. Climate Change Strategy for the Nairobi Convention. Nairobi Convention. Pp 63 https://wedocs.unep.org/handle/20.500.11822/25676
UNEP / Nairobi Convention	The State of Ocean governance in Western Indian Ocean	UNEP (United Nations Environment Programme)–Nairobi Convention, 2020. The State of Ocean Governance in the Western Indian Ocean. Nairobi, Kenya. https://wedocs.unep.org/handle/20.500.11822/33767?show=full
UNEP / Nairobi Convention	Strategic Action Programme for the Protection of the Coastal and Marine Environment of the Western Indian Ocean from Land-based Sources and Activities	UNEP/Nairobi Convention Secretariat, 2009. Strategic Action Programme for the Protection of the Coastal and Marine Environment of the Western Indian Ocean from Land-based Sources and Activities, Nairobi, Kenya, 140 pp.
UNEP/Nairobi Convention Secretariat and WIOMSA	Review of the policy legal and institutional frameworks in the WIO region	UNEP/Nairobi Convention Secretariat and WIOMSA, 2009. Regional synthesis report on the review of the policy, legal and institutional frameworks in the Western Indian Ocean (WIO) region, UNEP, Nairobi Kenya, 104p.
UNEP and WIOMSA	Regional State of the Coast Report. Western Indian Ocean	UNEP-Nairobi Convention and WIOMSA, 2015. The Regional State of the Coast Report: Western Indian Ocean. UNEP and WIOMSA, Nairobi, Kenya, 546 pp.
UN Environment	Transition to a Resilient Blue Economy in the WIO Region	Green Climate Fund proposal, 2017. Transition to a Resilient Blue Economy in the WIO Region https://wedocs.unep.org/handle/20.500.11822/25678

1.3.1 Positioning the strategy in the broader governance structures

This regional strategy for marine spatial planning in the WIO emphasises the importance of a systems thinking approach to deal with challenges and opportunities for ocean and coastal management in the region. The strategy highlights how everything is connected and that we therefore need regional and transboundary goals and commitments to overcome cross-cutting challenges such as climate change, sustainable fisheries management and maritime security and pollution.

By collating responses from stakeholders across the region on how they envision a regional MSP strategy and its implementation, the strategy is presenting a broad and multi-sectoral approach to MSP that better represents the needs and interests of individuals and groups in each WIO context. Although some WIO countries have progressed with implementing MSP strategies, this report highlights the importance of a cross-sectoral management approach, where some cross-cutting themes and transboundary issues can be properly managed only at a regional scale.

The WIO MSP strategy will support established strategies and conventions such as the Cairo Convention, Nairobi Convention (NC), the African Union (AU) Integrated Maritime Strategy (AIMS) and the AU Agenda 2063⁵¹, by providing roadmaps to implementation that are specific for the WIO region and support the creation and application of national MSPs that consider regional and transboundary issues and opportunities. The NC specifically calls for the development of regional MSP to better cooperate on governing ABNJ and coordinating blue economy pathways in the WIO (decision CP8/10). The NC further urges contracting parties to develop and implement ecosystem-based management approaches in their EEZ's informed by the AIMS and Agenda 2063. This regional WIO MSP strategy aims to ensure that the approach is synergised across sectors and the different countries in the region. The development and implementation of the WIO MSP strategy will also inform on progress at AMCEN sessions, as called for in the NC (decision CP8/5). Table 1 provides a summary (as at 2017) of the ratification of different conventions by WIO countries.

The strategy further complements the call from UNEP⁵² for unified and harmonised national legislations on land-based sources and activities (LBSA) and this strategy will support the unified and harmonised national legislation on ocean-based sources and activities (OBSA). It also highlights the need for strengthening Integrated Coastal Zone Management (ICZM) frameworks according to the NC, and provides an integrated ocean management framework that is cross-cutting across sectors, regions and national borders.

This regional strategy supports the implementation of the strategic priorities identified by UNEP's report on the state of ocean governance in the region⁵³, which provides a regional and multi-sectoral approach to jointly cover: i) maritime security and maritime boundaries; ii) fisheries; iii) exploitation of offshore mineral resources; iv) climate change; v) maritime transport and transport corridors; and vi) management of river basins draining into the WIO. The implementation of the WIO MSP strategy will improve and add to the reporting on further challenges to collaborative strategies and inform best practices for future international and regional guidelines and policies. The report recognises that we

⁵¹ African Union Commission, 2015. Agenda 2063. The Africa we Want. www.agenda2063.au.int

⁵² United Nations Environment Programme (UNEP), 2011. The Other 70%. UNEP Marine and Coastal Strategy. Kenya.

⁵³ UNEP–Nairobi Convention, 2020.

have to collaborate jointly towards a sustainable future, and therefore seeks to harmonise approaches to ocean management across sectors and countries in the region.

This strategy differs from the strong economic focus of the AIMS⁵⁴, Agenda 2063⁵⁵ and the AU-IBAR Blue Economy Strategy (BES)⁵⁶, and rather aims to support sustainable wealth creation through multi-sector and ecosystem-based approaches to development. Whereas the BES highlights economic importance in every goal and AIMS has a strong focus on wealth creation through the potential of the blue economy, the WIO MSP strategy provides guidelines on systems thinking approaches to ensure the prosperity of communities and the environment alongside the economy.

The role of the strategy in relation to the BES is supporting the objective of strengthening institutions for ‘governance to coordinate African Blue Economy’. In relation to the AIMS⁵⁷, this strategy supports and adds to the goal of achieving comprehensive and coordinated approaches to improve ‘maritime conditions with respect to environmental and socio-economic development’. Finally, the WIO MSP strategy supports the Agenda 2063⁵⁸ aspirations of i) inclusive growth, sustainable development, and iii) good governance. The strategy represents a roadmap to implementing the priority areas of ‘blue economy for accelerated economic growth’ whilst emphasising ‘sustainable and inclusive economic growth’. This can only be attained with a systems thinking approach that recognises the interconnectedness and interdependencies of different sectors, ecosystems and communities.

⁵⁴ AU, 2012.

⁵⁵ AUC, 2015.

⁵⁶ AU-IBAR, 2019.

⁵⁷ AU, 2012.

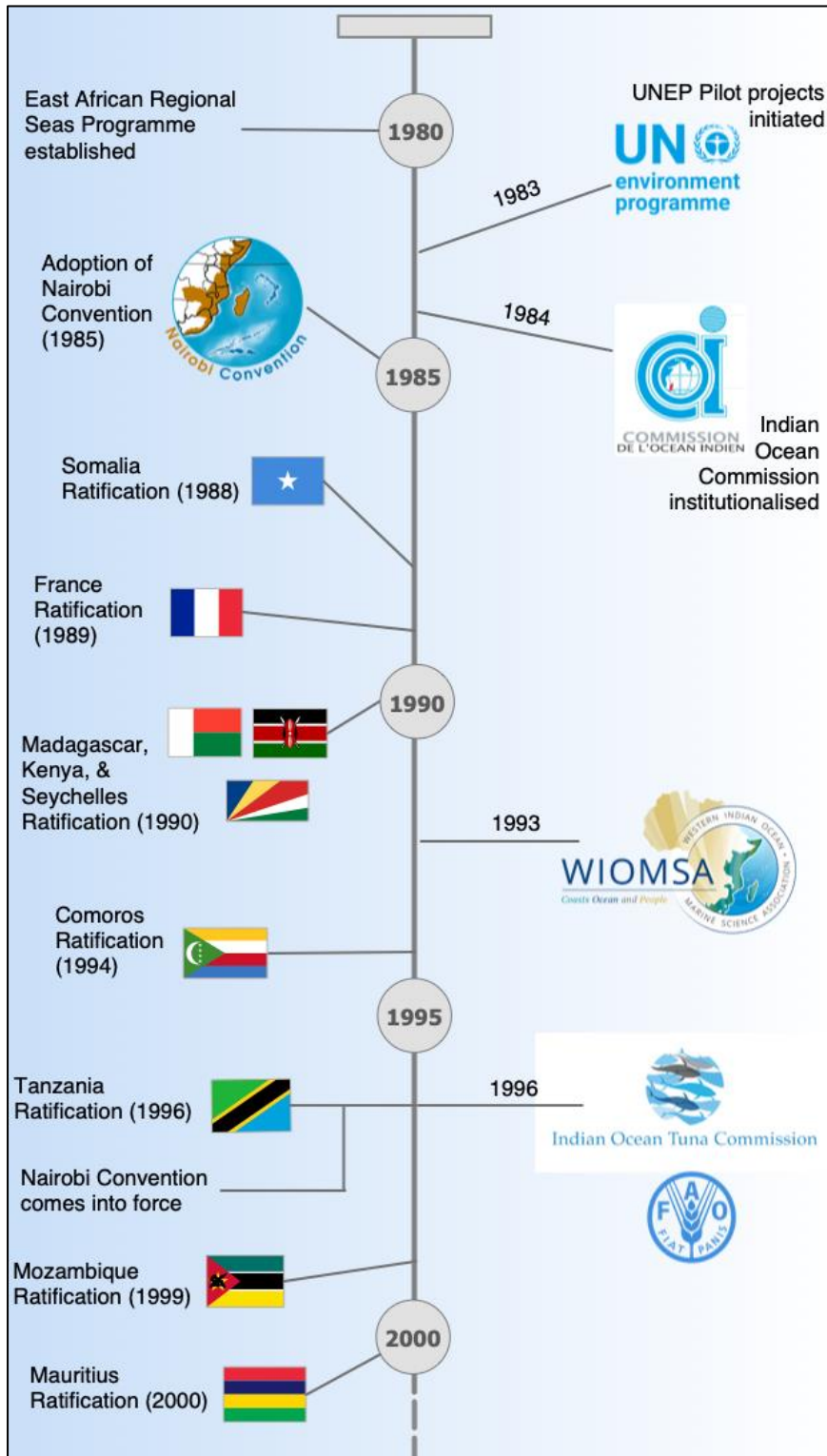
⁵⁸ AUC, 2015.

Table 1. 2017 ratification of global conventions (source: Green Climate Fund proposal, 2017. Transition to a Resilient Blue Economy in the WIO Region, <https://wedocs.unep.org/handle/20.500.11822/25678>)

Conventions	Comoros	Kenya	Madagascar	Mauritius	Mozambique	Seychelles	Somalia	South Africa	Tanzania
United Nations Convention on the Law of the Sea (UNCLOS)	1994	1989	2001	1996	1997	1991	1989	1997	1985
Convention on Biological Diversity	1994	1994	1996	1992	1995	1992	2009	1995	1996
United Nations Framework Convention on Climate Change (UNFCCC)	1994	1994	1999	1992	1995	1992	2009	1997	1996
Kyoto protocol to the UNFCCC	2008	2005	2003	2001	2005	2002	2010	2002	2002
Convention on Wetlands of International Importance (Ramsar Convention)	1995	1990	1999	2001	2004	2005		1975	2000
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	1994	1979	1975	1975	1977	1977	1985	1975	1979
African Convention on the Conservation of Nature and Natural Resources	2004	s	s		s		s	2013	s
Convention on the protection of underwater cultural heritage			2015					2015	
Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention)		y				y		y	y
International Convention for the Prevention of Pollution from Ships (MARPOL 73/78)	y	y	y	y	y			y	y
Convention on Persistent Organic Pollutants (Stockholm Convention)	2007	2004	2005	2004	2005	2008	2010	2002	2004

1.3.2 Positioning the strategy in the broader policy and programmatic structures

Figure 2 positions MSP in the WIO within the broader policy and programmatic space, focusing on the 1980-2018 period (note that the Figure is not intended as a comprehensive representation of all policies and projects).



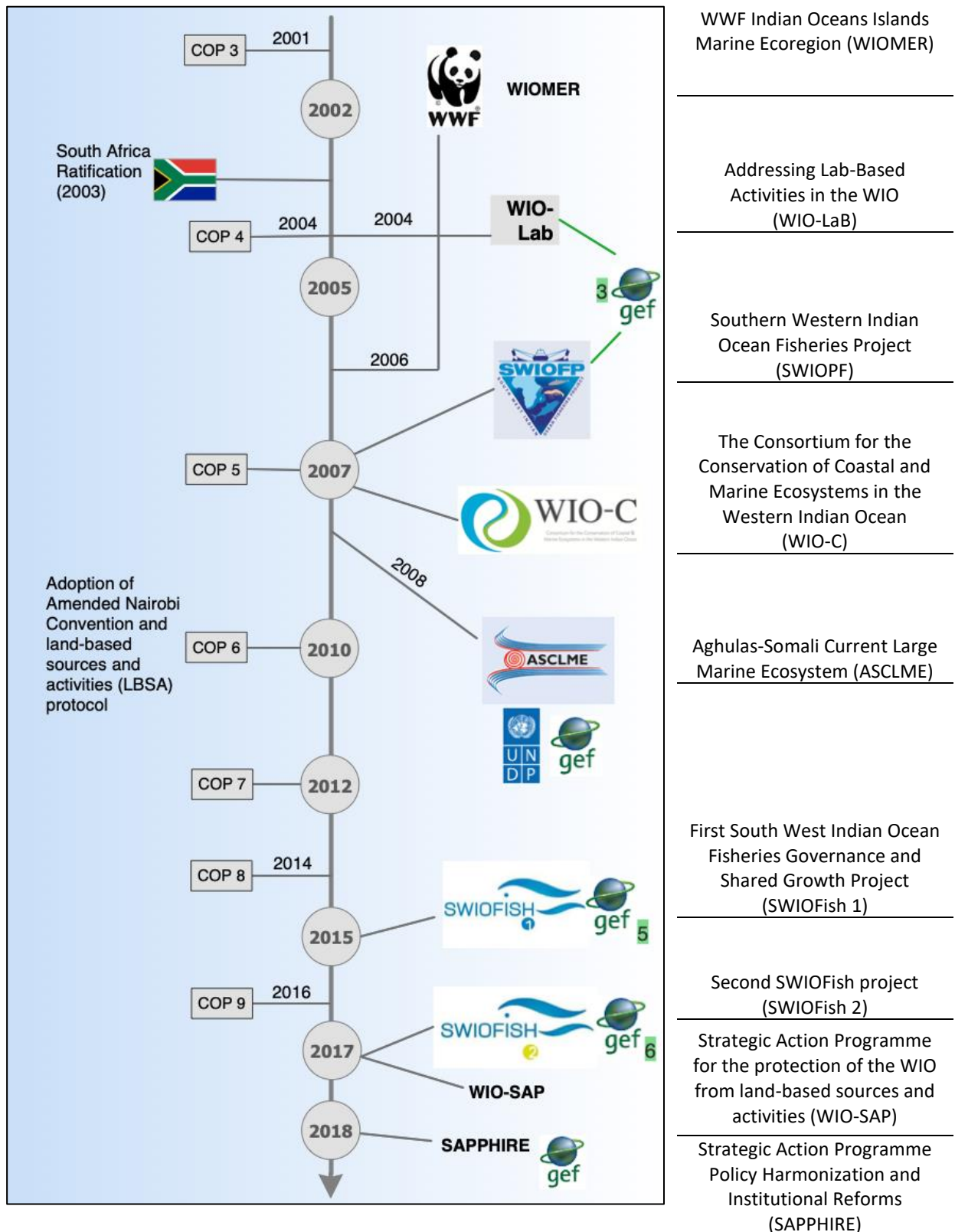


Figure 2. Timeline of MSP-related projects and programmes in the Western Indian Ocean, orientated around the Nairobi Convention and focusing on the period 1980 – 2018.

A description of the broader policy and programmatic landscape in which the regional MSP strategy is situated is provided in the Situational Report⁵⁹ that accompanies this Strategy.

1.4 Development of this strategy

This strategy was developed through an intensive stakeholder process conducted between June-December 2020.

At the WIO Regional MSP workshop held in Dar es Salaam, Tanzania in March 2019, the Focal Points of the Nairobi Convention, and those who participated in the workshop recommended the development of a regional MSP Strategy be led by a Technical Working Group (TWG) hosted by the Nairobi Convention Secretariat. As such, the TWG (two representatives from each country) were consulted to assist with providing information and MSP updates for each of the respective member states. Numerous meetings were set up with the TWG to initially get to know the members and establish a professional working relationship with them, and to identify some of their main priorities for a regional MSP strategy. Three meetings were conducted with the TWG. They were asked to answer three discussion questions that were used to inform the development of an online questionnaire (answers to the questions are provided in the Situational Report). This questionnaire was developed to gather essential information and data that could be used to inform the development of the MSP strategy, and consultations were used to identify additional stakeholders in the region.

The preliminary Situational Report conducted an assessment to (1) broadly review regional and national policies, legislations and governance structures for MSP implementation, (2) identify current MSP practices and initiatives in the WIO (3) identify capacity, gaps and opportunities for MSP and (4) determine the status of MSP in the region or MSP “readiness” for planned MSP initiatives. The aim of this assessment was to apply this information to the development of the MSP strategy, to identify opportunities for cross-border MSP across different governance structures and to provide broad guidelines and recommendations for MSP implementation at a national level in the WIO. Building on two preliminary reports^{60,61}, data and information for the Situational Report were gathered through a detailed literature review mostly incorporating online grey literature and published reports, but also published scientific articles. National level information was also obtained through *ad hoc* stakeholder engagement.

One of the main priorities of the strategy development process was to be as inclusive and transparent as possible, to develop a strategy that addresses the main needs and challenges in the WIO. While writing the Situational Report, a preliminary stakeholder mapping exercise was conducted to identify the high-level institutions associated with MSP in the region, and to identify key stakeholders that are either currently involved in MSP in the WIO or are likely to be key role players in future MSP initiatives. A stakeholder invitation letter was sent to a preliminary list of stakeholders (working in the marine

⁵⁹ UNEP–Nairobi Convention, WIOMSA, Nelson Mandela University, and Macquarie University, 2021. Situational report.

⁶⁰ Nairobi Convention Secretariat, Western Indian Ocean Marine Science Association and the Council for Scientific and Industrial Research, 2017. A Case for Marine Spatial Planning in the Blue Economy of the Western Indian Ocean. Prepared by the CSIR for the Nairobi Convention Secretariat and the Western Indian Ocean Marine Science Association. 53pp.

⁶¹ Nairobi Convention, 2020. Marine Spatial Planning in the Nairobi Convention Area: Current Status and Options for Future Development.

and coastal environment in the WIO), to introduce the project and to identify those who would like to contribute to the development of the MSP strategy. A snowball approach (asking stakeholders to identify additional relevant stakeholders in the region) was implemented to identify new stakeholders that would be interested in contributing to a regional MSP strategy. The TWG members were also responsible for identifying additional stakeholders in their respective countries, and for communicating the development of the strategy in their context. Stakeholders were also asked to answer the same initial discussion questions as the TWG, as seen below:

1. What do you think should be included in an MSP strategy for the WIO region?
2. How do you foresee the uptake and implementation of a regional MSP strategy in your country?
3. In what way do you envision a regional MSP strategy will assist in supporting the objectives of your country?

Over 100 stakeholders were identified and included in the engagement process (stakeholder invitation, discussion questions, questionnaire and feedback on the draft strategy). Responses to these questions were used to identify preliminary challenges/key issues in the region, goals, objectives, strategies and actions for MSP, which were used to inform the development of the online questionnaire where respondents were asked to rank the importance and relevance of these. A timeline of events and results of the number of responses is provided in Figure 3.

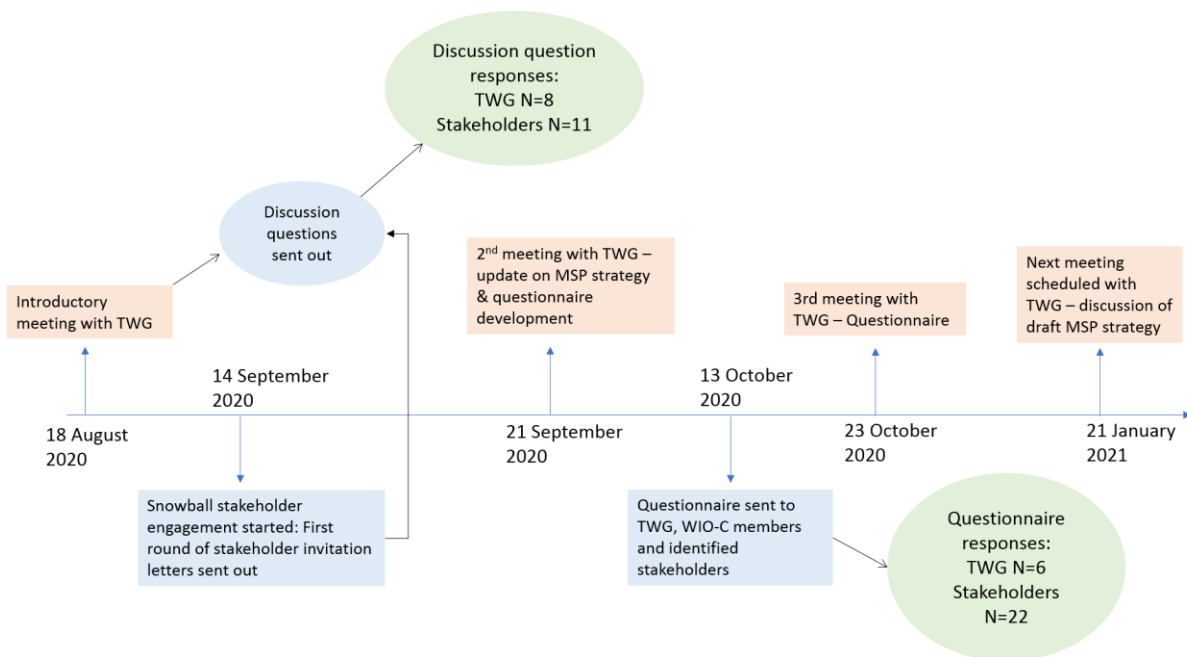


Figure 3. Timeline of events and responses of the engagement process for the development of the MSP strategy for the Western Indian Ocean.

1.5 Concepts defined

1.5.1 MSP: from integrated use to ecosystem-based perspectives

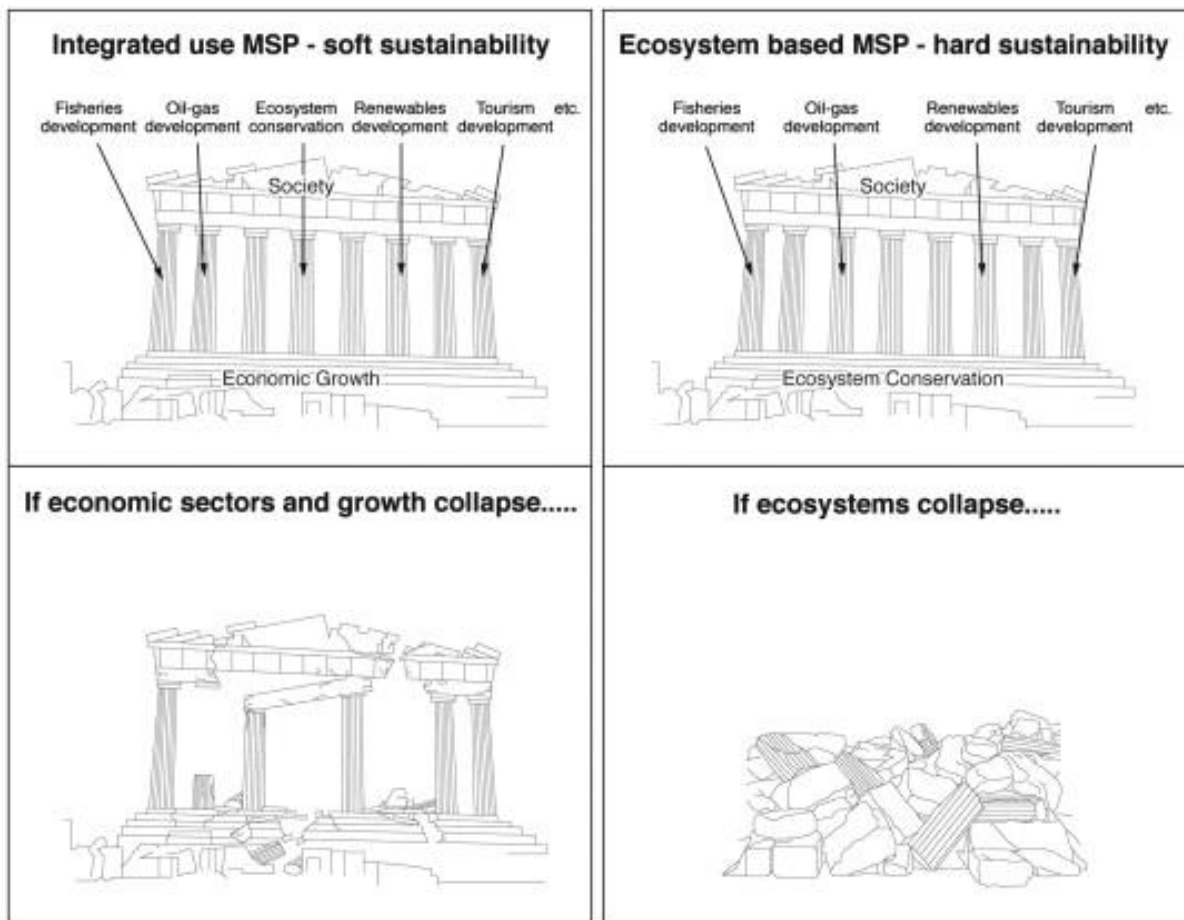


Figure 4 (from Qiu and Jones, 2013)⁶². “Different views on sustainability in MSP. The two figures on the left describe ecosystem-based MSP, and the anticipated consequences of ecosystem collapse, based on ‘hard sustainability’. This view sees ecosystem conservation as the foundation for MSP, and that irreversible collapses in marine ecosystems would eventually lead to collapses in the economic sectors that depend on such marine ecosystems. The two figures on the right describe integrated-use MSP, based on ‘soft sustainability’, in which economic growth is seen as the foundation of MSP, and the collapse of the ‘environmental pillar’ does not necessarily lead to the collapse of related socio-economic structures.”

Qiu and Jones⁶³ define ecosystem-based MSP as an approach that recognises that ecosystem health underpins other pillars of sustainable development and provides the foundation for cross-sectoral marine planning and management (Figure 4). Irreversible collapses in marine ecosystems would eventually lead to collapses in the economic sectors that depend on such marine ecosystems. Integrated-use MSP, however, places economic growth at the foundation of MSP, where the collapse

⁶² Qiu, W. and Jones, P.J., 2013. The emerging policy landscape for marine spatial planning in Europe. *Marine Policy*, 39, pp.182-190.

⁶³ Qiu and Jones, 2013.

of the ‘environmental pillar’ would not necessarily lead to the collapse of related socio-economic structures. The ecosystem-based approach to MSP is more aligned with a blue economy agenda, whereas integrated-use MSP is more aligned with an oceans economy agenda.

UNESCO⁶⁴ defines MSP as “The public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic and social objectives that are usually specified through a political process. MSP should be ecosystem-based and is an element of sea use management.” It further sets out a 10-step approach to developing and implementing a marine spatial plan but argues that this is rarely if ever practically feasible as it is too linear and neglects the challenges of the diversity of priorities that different interests bring to the process and of reconciling trade-offs⁶⁵. In reality, the challenge is to try and evolve or transform MSP approaches from a ‘business as usual’ approach to an ecosystem-based approach, summarised below:

<i>Business as Usual</i>	<i>Ecosystem-based approach</i>
<ul style="list-style-type: none"> • Short-term priorities (GDP) • Dominance of elites • Economic development-focus • Sectoral • Many unresolved conflicts • Fragmented sectoral policy framework • Low ecological connectivity • Low resilience <p><i>i.e. soft sustainability</i></p>	<ul style="list-style-type: none"> • Long-term priorities (resilience) • Accountability and Justice • Conservation and compatible economic development • Cross-sectoral integration and trade-offs analysed • Effective conflict management • Integrated sectoral policy framework • High ecological connectivity • High resilience <p><i>i.e. hard sustainability</i></p>

The Convention on Biological Diversity defines the ecosystem approach as “a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. Application of the ecosystem approach will help to reach a balance of the three objectives of the Convention. It is based on the application of appropriate scientific methodologies focused on levels of biological organization which encompass the essential processes, functions and interactions among organisms and their environment. It recognizes that humans, with their cultural diversity, are an integral component of ecosystems⁶⁶.” Human and environmental elements must both be considered at regional scales in regional MSP strategies (these elements are summarised below):

⁶⁴ Ehler, C. and Douvère, F., 2009. Marine Spatial Planning: a step-by-step approach toward ecosystem-based management. Intergovernmental Oceanographic Commission and Man and the Biosphere Programme. IOC Manual and Guides No. 53, ICAM Dossier No. 6. Paris: UNESCO.

⁶⁵ Jones, P.J., Lieberknecht, L.M. and Qiu, W., 2016. Marine spatial planning in reality: Introduction to case studies and discussion of findings. Marine Policy, 71, pp.256-264.

⁶⁶ <https://www.cbd.int/ecosystem>

Human elements	Environmental elements
<ul style="list-style-type: none"> • Stakeholder participation in decision-making • Equity amongst users • Economically sustainable • Multi-sectoral approach – integration of sectoral policies • Fulfilling societal needs, particularly for ecosystem services 	<ul style="list-style-type: none"> • Taking account of ecological scales, rather than administrative boundaries • Maintaining the structural and functional attributes of ecosystems • Living within environmental limits • Sustainable use • Taking account of cumulative impacts • Maintaining resilience through diversity • Ensuring that the flow of ecosystem services is maintained.
<p>i.e. Analogous to sustainable development</p>	

An ecosystem-based approach to MSP should integrate the complexity of ecosystems as well as the interaction between humans and ecological systems with management decisions^{67,68}. It aims for integrated management, conservation of ecosystems and sustainable use of ecosystem goods and services. If MSP can apply the ecosystem-based approach as its overarching framework, important ecological areas can be safeguarded, especially if not already legally protected, and negative pressures on the health of the ecosystem as a whole can be greatly reduced.

A good example of an ecosystem approach to MSP is provided by Finland⁶⁹. Although not a regional MSP strategy, the principles, process and implementation steps can be adapted to a regional scale. Finland defines an ecosystem-based approach as one that recognises the marine environment's carrying capacity and develops planning solutions to promote sustainable use and the achievement of good marine environmental status, as defined by the Marine Strategy Framework Directive of the European Union⁷⁰. While recognising the special characteristics and water status of Finnish marine areas, they also recognise that environmental objectives are specified in international agreements and EU and national legislation, and aim to support these with available means of planning. The environmental objectives of their MSP are also cascaded into regional and local spatial planning.

⁶⁷ Long, R.D., Charles, A. and Stephenson, R.L., 2015. Key principles of marine ecosystem-based management. *Marine Policy*, 57, pp.53-60.

⁶⁸ Buhl-Mortensen, L., Galparsoro, I., Fernández, T.V., Johnson, K., D'Anna, G., Badalamenti, F., Garofalo, G., Carlström, J., Piwowarczyk, J., Rabaut, M. and Vanaverbeke, J., 2017. Maritime ecosystem-based management in practice: lessons learned from the application of a generic spatial planning framework in Europe. *Marine Policy*, 75, pp.174-186.

⁶⁹ <https://www.merialuesuunnittelu.fi/wp-content/uploads/2020/10/Ecosystem-based-approach-in-Finnish-MSP.pdf>

⁷⁰ <http://msfd.eu/site/good-environmental-status/>

1.5.2 Blue Economy, oceans economy and ocean accounting

The ocean plays a major role in the provision of market and non-market goods and services to people. There is a rapid increase globally in policies and strategies for Blue Economies and Ocean Economies, as nations or regions turn to new opportunities to foster economic growth and ensure food and energy security. Although the literature used the terms “blue” and “ocean” economies somewhat interchangeably, here we draw a distinction between the two approaches, based on a fundamental difference between them. A blue economy refers to the economic potential of ocean resources that is underpinned with the need to ensure ocean health and sustainability, whereas an oceans economy refers to economic activities that directly or indirectly take place in the ocean, use outputs from the ocean, and put goods and services into oceanic activities with a focus on economic gain rather than ocean health⁷¹.

1.5.2.1 Blue economy

In 2017, The World Bank Group and the UN published a document outlining the potential of the Blue Economy for Small Island Developing States and Coastal Least Developed Countries (relevant to the WIO)⁷². They define the blue economy as follows:

“Although the term “blue economy” has been used in different ways, it is understood here as comprising the range of economic sectors and related policies that together determine whether the use of oceanic resources is sustainable. An important challenge of the blue economy is thus to understand and better manage the many aspects of oceanic sustainability, ranging from sustainable fisheries to ecosystem health to pollution. A second significant issue is the realization that the sustainable management of ocean resources requires collaboration across nation-states and across the public-private sectors, and on a scale that has not been previously achieved. This realization underscores the challenge facing the Small Island Developing States (SIDS) and Least Developed Countries (LDCs) as they turn to better managing their blue economies.

The “blue economy” concept seeks to promote economic growth, social inclusion, and the preservation or improvement of livelihoods while at the same time ensuring environmental sustainability of the oceans and coastal areas. At its core it refers to the decoupling of socioeconomic development through oceans-related sectors and activities from environmental and ecosystems degradation. It draws from scientific findings that ocean resources are limited, and that the health of the oceans has drastically declined due to anthropogenic activities. These changes are already being profoundly felt, affecting human well-being and societies, and the impacts are likely to be amplified in the future, especially in view of projected population growth.”

Fenichel et al.⁷³ further illustrate the three objectives of blue economic development (Figure 5).

⁷¹ Potgieter, T., 2018. Oceans economy, blue economy, and security: notes on the South African potential and developments. *Journal of the Indian Ocean Region*, 14(1), pp.49-70.

⁷² World Bank and United Nations Department of Economic and Social Affairs, 2017. *The potential of the blue economy: increasing long-term benefits of the sustainable use of marine resources for small island developing states and coastal least developed countries*. World Bank, Washington DC.

⁷³ Fenichel, E.P., Addicott, E.T., Grimsrud, K.M., Lange, G.M., Porras, I. and Milligan, B., 2020. Modifying national accounts for sustainable ocean development. *Nature Sustainability*, 3(11), pp.889-895.

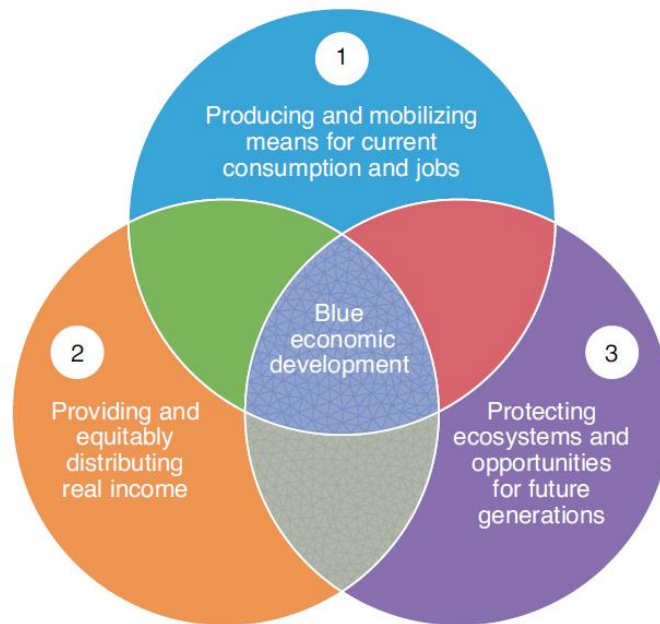


Figure 5. The three objectives of blue economic development. Sustainable development at a minimum requires balance of three spheres of interest; production of opportunities today, distribution of those opportunities today, and allocating opportunities between today and tomorrow. Sustainable development is the intersection and balancing of these three areas of concern.

1.5.2.2 Oceans economy

An ocean economy measures the production outputs of human efforts related to the ocean (be these efforts on, in, under, dependent on, or linked to the ocean). These measures are then provided as inputs to the achievement of social and economic goals. The focus is specifically on the use of ocean resources for production, consumption, income generation and employment goals. The major aim is to promote resource production or mobilization, and to maximise production of current consumable (intermediate, final, accumulation, export) output, business transactions and employment. Ocean economy valuations are often required for ocean governance and are largely undertaken as gross value add of market value ocean contribution to GDP by Sector or Value Chain. This approach meets only one of the three major objectives of blue economies (which aim to measure more holistic contribution of oceans to societal well-being) and falls short on inclusivity (or who benefits from ocean economies), sustainability (measured through changes in ocean wealth), sectoral inclusion and disaggregation of economic and other data that pertain to the oceans alone. A monetarised approach that relies on only GDP also ignores non-market good and services for people (e.g. recreation as a cultural ecosystem service or the non-market values of regulatory ecosystem services).

1.5.2.3 Ocean Accounting

The System of Environmental-Economic Accounting (SEEA) developed by the UN is an international statistical standard that uses a systems approach to bring together economic and environmental information to measure the contribution of the environment to the economy and the impact of the economy on the environment. The SEEA uses a structure and classifications consistent with the System of National Accounts (SNA) to facilitate the development of indicators and analysis on the economy-environment nexus (<https://seea.un.org/content/frequently-asked-questions>).

SEEA is now being implemented in 50+ countries, however, its application to ocean environments has been limited to date and presents a range of conceptual and technical challenges (e.g. concerning the classification of ocean ecosystems and associated benefits, across large and dynamic spatial scales). These are further complicated by the practical importance of interlinking environmental and various socioeconomic statistics (e.g. concerning ocean livelihoods, poverty, disaster risk and climate change), and structured information about the status of characteristics of oceans governance, that fall beyond the core scope of the SEEA framework. (<https://www.oceanaccounts.org/about-the-global-ocean-accounts-partnership/>)

The Global Ocean Accounts Partnership (www.oceanaccounts.org) responds to the above challenges by establishing a coordination and communication structure for diverse member institutions, who have a common interest to ensure that the values and benefits of oceans are recognized and accounted for in decision-making about social and economic development. The partnership aims to measure and manage progress towards sustainable ocean development, through the inclusion of environmental, social and economic domain metrics in the estimation of holistic measures of the contribution of oceans to societal well-being. Oceans Accounting advances standardised consistent frameworks to include metrics from across these three domains using both accepted and novel accounting frameworks.

- The spatial System of Environmental Economic Accounting (SEEA) provides an Ecosystem Accounting framework that includes assessments of ecosystem asset condition and extent, and the identification of ecosystem services and abiotic service assets.
- The Ocean Accounts Framework (Figure 6) addresses ecosystem and abiotic flows of natural capital and incorporates both the flows to economic sectors and the impact flows from sectors to the environment.
- Ocean Economy Satellite Accounts within the System of National Accounts allow for the economic contribution of ocean sectors to be measured.
- The framework also introduces guidance on novel accounting of ocean risk; access and inclusivity in terms of ocean use, benefits and costs; and ocean governance

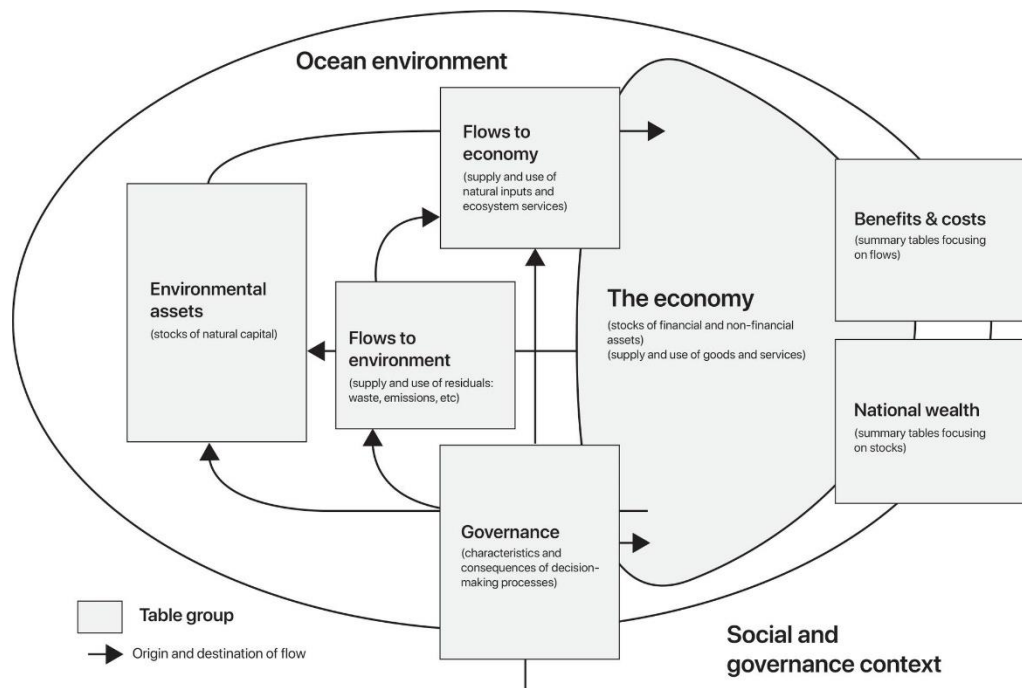


Figure 6. The Ocean Accounts Framework: an integrated structure for ocean data and statistics (from <https://www.oceanaccounts.org/technical-guidance-on-ocean-accounting-2/>).

An Africa Natural Capital Accounting Community of Practice is a partner in the Global Ocean Accounts Partnership and is advancing ocean accounting in Africa (see <https://www.oceanaccounts.org/africa-community-of-practice/>). The systems approaches used in the SEEA and promoted by this regional MSP strategy can lay the foundation for cohesion between economic development and environmental sustainability agendas across the region's oceans and coasts.

1.5.2.4 Possible futures for the Western Indian Ocean

Obura et al.⁷⁴ provide some possible futures for the Western Indian Ocean, based on a business-as-usual scenario, versus a sustainable and inclusive blue economy scenario (see below). A key feature in the great value of the sustainable blue economy scenario is in the high social value sectors, such as artisanal fishing, that provide secure livelihoods.



⁷⁴ Obura, D., et al., 2017. WWF.

1.5.3 MSP as part of Integrated Ocean Management

MSP processes and the UN SDGs are two high-level responses to the deteriorating state of global ocean health and the need for integrated management responses. Climate change, fisheries and pollution are global marine challenges that require urgent management regime shifts, and fishery co-management⁷⁵ and spatial protection⁷⁶ serve as examples of response strategies. MSP processes have gained traction as best practice to address spatial components of ocean management and have received significant uptake across governance scales from local to regional⁷⁷ and been supported by a range of decision-support tools, processes and approaches⁷⁸. MSP's popularity stems from its purported ability to address the spatial complexity of the marine environment and the primarily silo-driven current structures involved in ocean governance and management⁷⁹. However, the acceptance of MSP is not without criticism and its application is not without challenges^{80,81}. There are a number of tensions that MSP processes are failing to navigate adequately, namely: competing agendas between ecosystem-based versus integrated use MSP; the long timeframes required for stakeholder-driven approaches versus the quicker gains of plan development; the acceptance of current conditions as a de facto starting point for planning versus the “rewinding” to healthier social-ecological systems of the past and using those as starting points; and finding the balance between detail and utility (i.e. between tools, processes and models being either too simple or too complex to be useful for MSP, particularly in least developed countries). To address these shortcomings, MSP approaches should not be applied in isolation, but rather under an umbrella of Integrated Ocean Management (IOM) approaches that include integrated coastal zone management approaches, ecosystem approaches to fisheries management, consumer incentives, etc. Systems thinking approaches are specifically suited to integrated management. “IOM should thus be the key overarching approach for achieving a sustainable blue economy, building upon and connecting existing sectoral governance efforts. IOM can serve as a holistic, ecosystem-based and knowledge-based approach that aims to ensure the sustainability and resilience of marine ecosystems while integrating and balancing different ocean uses to optimize the overall ocean economy”⁸².

MSP or zoning processes are often part of IOM, and can integrate well with other sectorial or scientific zoning initiatives, including Large Marine Ecosystems (LMEs), Marine Protected Areas (MPAs), the Convention on Biological Diversity's (CBD) Ecologically or Biologically Significant Marine Areas (EBSAs), the Food and Agriculture Organisation Vulnerable Marine Ecosystems (VMEs), the International

⁷⁵ d'Armengol, L., Castillo, M.P., Ruiz-Mallén, I. and Corbera, E., 2018. A systematic review of co-managed small-scale fisheries: social diversity and adaptive management improve outcomes. *Global environmental change*, 52, pp.212-225.

⁷⁶ Ban, N.C., Davies, T.E., Aguilera, S.E., Brooks, C., Cox, M., Epstein, G., Evans, L.S., Maxwell, S.M. and Nenadovic, M., 2017. Social and ecological effectiveness of large marine protected areas. *Global Environmental Change*, 43, pp.82-91.

⁷⁷ Jones, et al., 2016.

⁷⁸ Santos, C.F., Agardy, T., Andrade, F., Crowder, L.B., Ehler, C.N. and Orbach, M.K., 2018. Major challenges in developing marine spatial planning. *Marine Policy*. <https://doi.org/10.1016/j.marpol.2018.08.032>.

⁷⁹ Clarke, J. and Flannery, W., 2020. The post-political nature of marine spatial planning and modalities for its re-politicisation. *Journal of Environmental Policy & Planning*, 22(2), pp.170-183.

⁸⁰ Lombard, et al., 2019.

⁸¹ Santos, C.F., Agardy, T., Andrade, F., Calado, H., Crowder, L.B., Ehler, C.N., García-Morales, S., Gissi, E., Halpern, B.S., Orbach, M.K. and Pörtner, H.O., 2020. Integrating climate change in ocean planning. *Nature Sustainability*, 3(7), pp.505-516. <https://doi.org/10.1038/s41893-020-0513-x>

⁸² Winther, J.G., Dai, M., Rist, T., Hoel, A.H., Li, Y., Trice, A., Morrissey, K., Juinio-Meñez, M.A., Fernandes, L., Unger, S. and Scarano, F.R., 2020. Integrated ocean management for a sustainable ocean economy. *Nature ecology & evolution*, 4(11), pp.1451-1458.

Maritime Organisation’s Particularly Sensitive Sea Areas (PSSAs), the International Seabed Authority’s Areas of Particular Environmental Interest (APEIs), locally managed marine areas (LMMAs), taboo zones, spawning or nursery areas, BirdLife’s Important Bird and Biodiversity Areas (IBAs), the IUCN’s Important Marine Mammal Areas (IMMAs), other key biodiversity areas, ‘hope spots’⁸³, etc. However, zoning is not a panacea. It needs to carefully aim to meet different user needs, while ensuring that the underlying ecosystem is not being undermined. IOM is also an opportunity for fostering innovation, such as through Payment for Ecosystem Services Zones or Community Management Zones. However, the spatial and structural view on the ocean should not be overly emphasised; a more functional perspective is essential to ensure continued ocean health and integrity, and delivery of ecosystem services (Sustainable Ocean Lab)⁸⁴.

⁸³ <https://mission-blue.org/hope-spots/>

⁸⁴ <https://sustainableoceanslab.org/>

1.5.4 Systemic Framework

The regional strategy will follow a systems thinking approach, which is introduced here with a brief theoretical description and then an applied discussion.

1.5.4.1 What is systems thinking?

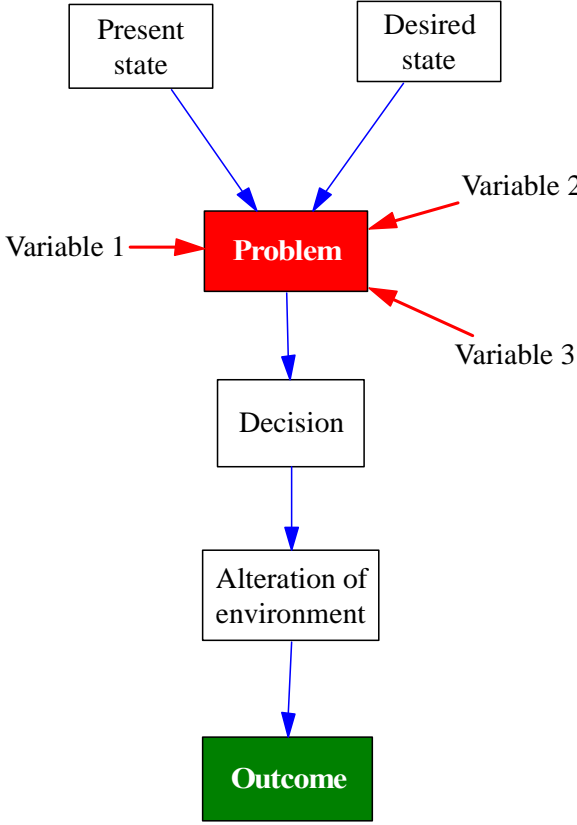
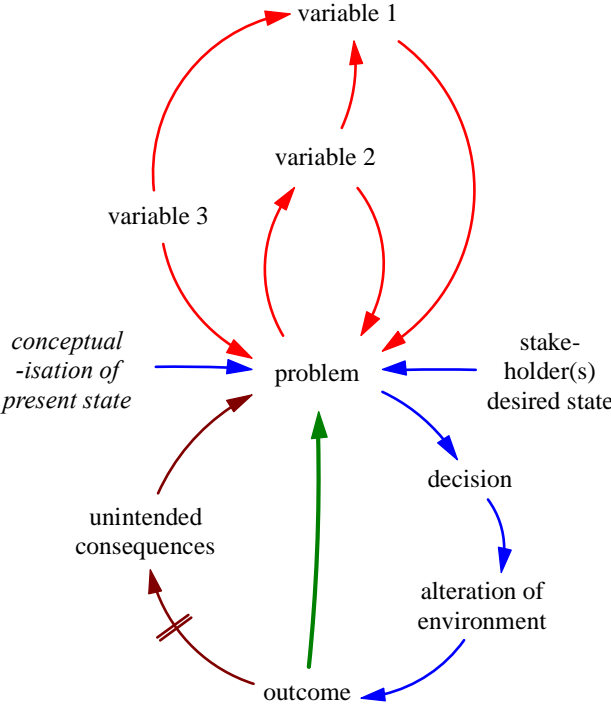
Systems thinking and modelling encompasses a broad set of skills, tools, approaches and processes that are well suited to complex, interconnected problems such as the problems that MSP seeks to address. The holistic nature of a systems perspective encourages the breaking down of the mentality of remaining in separate 'silos' (i.e. disciplines, departments, organisations). It requires that we overcome short-term and short-sighted decision-making, while seeking a balance between a high-level (i.e. strategic) and more detailed (i.e. operational) perspective, helping to "see the forest for the trees".

1.5.4.2 How can systems thinking be applied practically to MSP?

- Systems thinking in practice aims to make explicit the trade-offs between various options and actions and becoming clearer on the assumptions underpinning policies and actions.
- It also seeks to minimise the negative unintended consequences of policies and actions.
- Systems thinking in practice requires helping problem holders to see the world through the eyes of others, and mediating between conflicting ideologies, values, and ways of working.
- Working systemically is a useful way of representing the trade-offs between policies and desired outcomes, showing where policies can constrain or conflict with one another, versus how they can reinforce and support one another. The objective is to achieve synergies and co-benefits and to minimise undesirable trade-offs.
- Finally, it involves developing ways of testing policies in a simulation environment, for example by building simulation models, using management flight simulators, and undertaking systems-based social simulations (i.e. role playing games) to support decision making.

1.5.4.3 Contrasting a linear/silo perspective with a systemic perspective

As a way of further defining systems thinking, it is helpful to contrast a linear perspective with a systemic perspective (see diagram below of a linear versus systemic perspectives of addressing complex problems).

A linear perspective	A systemic perspective
	
Problems can be traced back to root causes via a causal chain	Problems emerge out of the interactions between the variables and the problem itself
Outcomes are shaped by the collective effect of a series of inputs or causes acting sequentially	Outcomes are shaped by a combination of time delays, the system's structure, the associated feedback loops, and the adverse effects of actions (i.e. unintended consequences)
There is a definable present state	The present state is conceptualised by one or more stakeholder(s)
There is a definable desired state	The desired state depends on which stakeholders' perspective(s) you take
The goal is to undertake many independent initiatives simultaneously aiming to improve all the parts	The goal is to identify a few key interdependencies that have the greatest leverage on system-wide performance (i.e. leverage points) and shift them in a sustained way over time

2 Components of this document

The components of this document are illustrated in Figure 7. Numbers indicate the section numbers where the related text is provided.

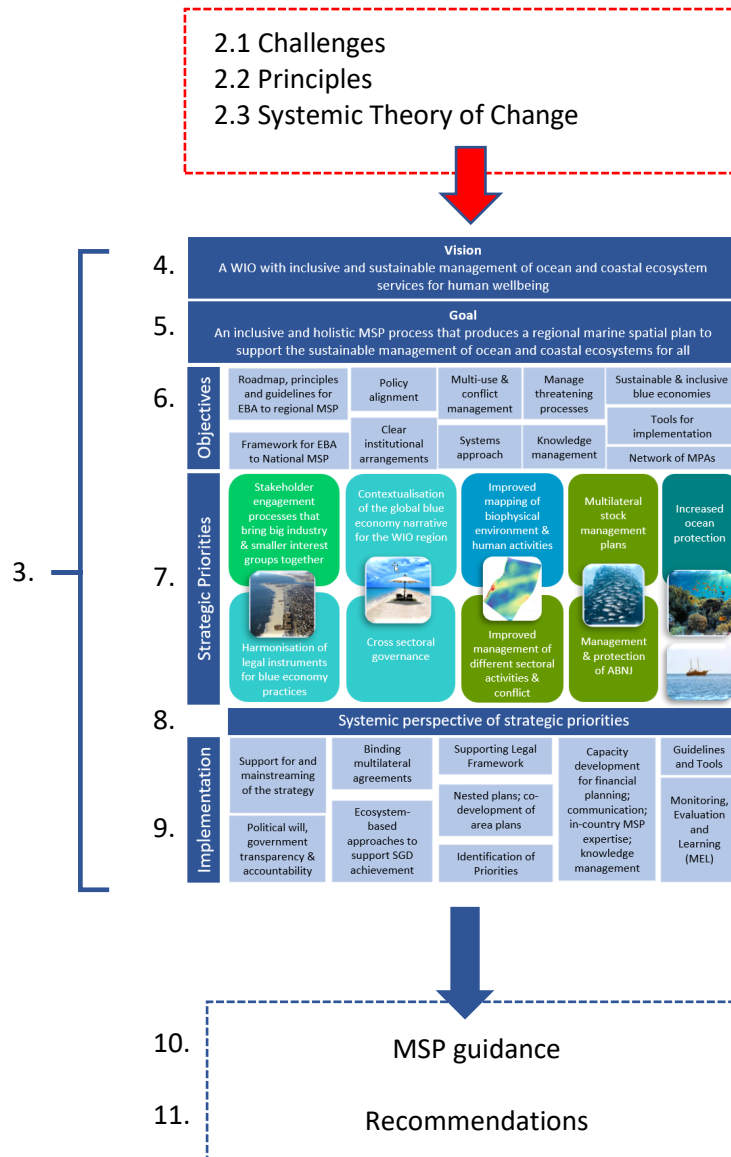


Figure 7. The components of this strategy document.

2.1 Challenges

Since the WIO is within the jurisdiction of 10 East African nations that have different histories, government systems, and social, economic, and ecological contexts, it is important to understand the common problems that could potentially influence the use and implementation of MSP in the region. Whilst the regional MSP Strategy recognises the autonomy of each nation, we envision that this strategy could also help address these problems in the WIO. This section below will discuss the key governance challenges and threatening processes that were identified by the TWG and stakeholders (i.e., other WIO government planners and managers, academics, and NGOs) in the WIO through the questionnaire that was circulated from October to December 2020.

Drawing on interactive governance theory^{85,86} we define governance as the ability of governments to govern interactions of social, economic, ecological, and political processes in any political unit. Hence, in the section on governance challenges, we focus on the main issues and problems raised by respondents that limit the ability of nations to effectively govern the WIO. We then discuss the most important threats that were identified by the respondents that the regional MSP Strategy could address.

2.1.1 Governance challenges

The text box below presents the results of the questionnaire that asked the TWG and other stakeholders to identify governance challenges in the WIO that should be addressed by a regional WIO MSP strategy.

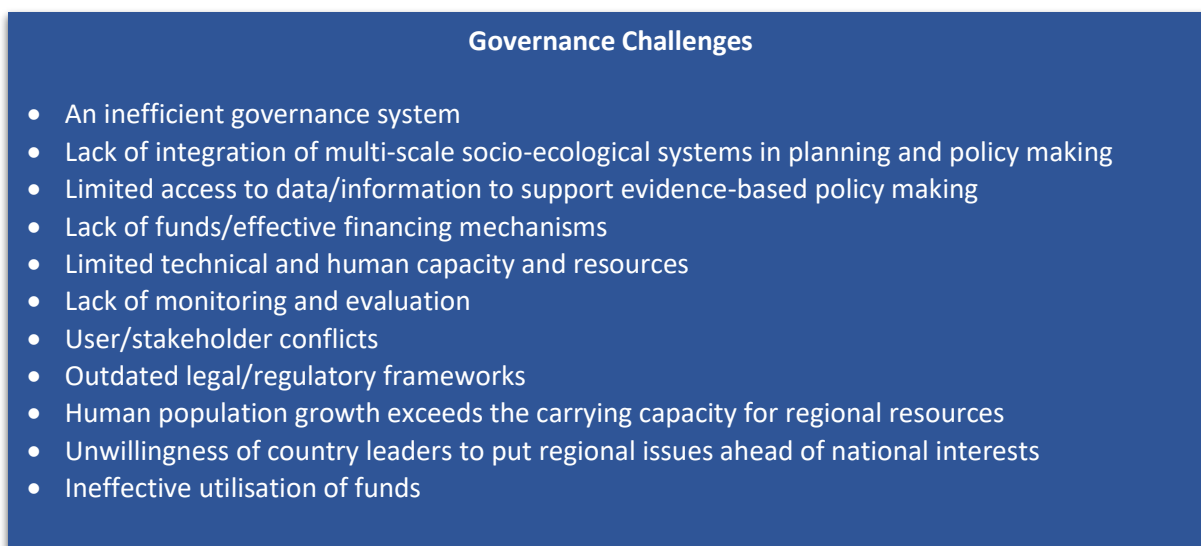


Figure A1 (Appendix) shows the frequency distribution of survey responses per governance challenge identified; whereas Figure A2 (Appendix) shows the weighted ranking of survey responses for all the governance challenges. Responses showed that the inefficient governance system was ranked the

⁸⁵ Kooiman, J., 2003. *Governing as governance*. Sage.

⁸⁶ Kooiman, J. and Bavinck, M., 2013. Theorizing governability—The interactive governance perspective. In *Governability of fisheries and aquaculture* (pp. 9-30). Springer, Dordrecht.

highest based on individual survey responses. This was followed by the lack of integration of multi-scale ecological systems, limited access to data/ information, lack of funds/ effective financing mechanisms, and limited technical and human capacity. These challenges had a weighted ranking of more than 50%. Other challenges identified were a lack of monitoring and evaluation, user/stakeholder conflicts, and outdated legal/regulatory frameworks. Three additional challenges were identified in follow-up discussions, namely, a growing human population that exceeds the carrying capacity for resources in the region (and is ignored by governments), an unwillingness of country leaders to put regional issues ahead of national interests, and ineffective utilisation of funds (through corruption, donor constraints, or other issues).

The survey responses were not new, because these governance challenges were also commonly described in the marine protected area (MPA) and coastal resource management (CRM) literature. More specifically, the efficient governance systems, financial sustainability, and sufficient technical and human resources and capacity, have all been noted as key to successful and sustained management of MPAs^{87,88,89} and CRM^{90,91}.

2.1.2 Threatening Processes

The text box below presents the results of the questionnaire that asked the TWG and other stakeholders to identify threatening processes in the WIO (and in their specific countries) that should be addressed by a regional WIO MSP strategy. These threats provide context for the strategy and the proposed actions that are provided as recommendations.

⁸⁷ Gill, D.A., Mascia, M.B., Ahmadi, G.N., Glew, L., Lester, S.E., Barnes, M., Craigie, I., Darling, E.S., Free, C.M., Geldmann, J. and Holst, S., 2017. Capacity shortfalls hinder the performance of marine protected areas globally. *Nature*, 543(7647), pp.665-669.

⁸⁸ McCrea-Strub, A., Zeller, D., Sumaila, U.R., Nelson, J., Balmford, A. and Pauly, D., 2011. Understanding the cost of establishing marine protected areas. *Marine Policy*, 35(1), pp.1-9.

⁸⁹ Agardy, T., Di Sciara, G.N. and Christie, P., 2011. Mind the gap: addressing the shortcomings of marine protected areas through large scale marine spatial planning. *Marine Policy*, 35(2), pp.226-232.

⁹⁰ Pollnac, R.B. and Pomeroy, R.S., 2005. Factors influencing the sustainability of integrated coastal management projects in the Philippines and Indonesia. *Ocean & coastal management*, 48(3-6), pp.233-251.

⁹¹ Le Tissier, M., 2020. Unravelling the relationship between ecosystem-based management, integrated coastal zone management and marine spatial planning. In *Ecosystem-Based Management, Ecosystem Services and Aquatic Biodiversity* (pp. 403-413). Springer, Cham.

Threatening Processes

- Biodiversity loss
- Habitat loss or destruction
- Unsustainable fishing (including illegal, unreported and unregulated (IUU) fishing)
- Coastal development/land-based pollution & sedimentation
- Climate-driven changes (e.g. sea level rise)
- Marine-based pollution
- Piracy/marine safety and security
- Poor management of ship traffic

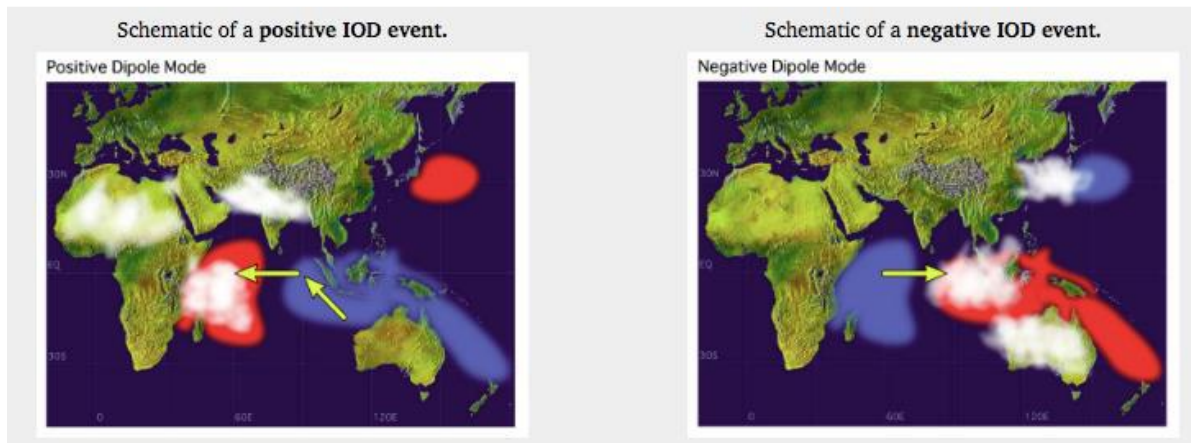
Figure A3 (Appendix) shows the frequency distribution of survey responses per threatening process identified; whereas Figure A4 (Appendix) shows the weighted ranking of survey responses for all the threatening processes. Responses identified five main threatening processes: biodiversity loss, habitat loss or destruction, unsustainable fishing (including illegal, unreported and unregulated fishing), coastal development/land-based pollution and sedimentation, and climate-driven changes (including sea level rise and food security). These threats each had a weighted ranking of more than 50%. Additional threats of concern were marine-based pollution, piracy/marine safety and security, and poor management of ship traffic. The responses are consistent with the most recent State of Coasts report for the WIO⁹², which also describe the main problems and drivers of change in the condition of ecosystems in the WIO.

Fundamentally, the social-ecological system in the WIO is at risk. In a concept note to the Green Climate Fund⁹³, the UN provided this background: “Over 60 million people in the WIO islands and Eastern Africa coastal communities rely on the coastal and marine environment for goods and services. Coastal and island communities are largely dependent on fishing, shipping and tourism for their livelihoods. Yet the natural resources that provide sustainable livelihoods and fuel economic activity are already under pressure from threats such as poverty, overfishing, overdevelopment, pollution, and environmental degradation. The impacts of climate change are exacerbating these problems and are already presenting mounting challenges to the sustainable development of the region as evidenced by widespread coral reef bleaching (with limited recovery), prolonged droughts, sea level rise and flooding/sedimentation which have significant potential to retard economic growth and slow realization of respective national development targets including SDGs. Hitherto regular weather patterns have become more unpredictable in recent years, with erratic rainfall patterns and inconsistent monsoon periods. In particular, this has caused greater disruption to communities whose livelihood activities are closely intertwined with weather patterns, such as agriculture and fishing. The El Niño Southern Oscillation (ENSO) and the Indian Ocean Dipole (IOD) are two similar phenomena with great influence over the WIO marine environment (see Figures below). The region is facing extreme rainfall anomalies that are associated with ENSO. Regional coastal areas are confronted with irregular oscillations of Sea Surface Temperatures (SST) between ‘positive’, ‘neutral’ and ‘negative’ phases. As illustrated in the image below, the positive IOD event registers a trend of irregular cooling of SST in the south-eastern equatorial Indian Ocean and atypical warming of SST in the western

⁹² UNEP-Nairobi Convention and WIOMSA, 2015.

⁹³ UNEP, 2017.

equatorial Indian Ocean. These events impair the normal convection bringing the eastern Indian Ocean's warm pool to the west and carrying heavy rainfall over East Africa."



The concept notes go on to describe the significant warming of the Indian Ocean "(significant at 1% since the middle of the 20th century). The Intergovernmental Panel on Climate Change (IPCC) also predicts that by 2100 sea levels will have risen by between 0.26 and 2.3 metres, and there is a consensus that a climate shift will impact the frequency, intensity and temporal and spatial variability of rainfall, cyclones and tropical storms resulting in floods and the destruction of property, high rates of coastal erosion, saline water intrusion, reduced economic opportunities and habitat loss under a business as usual (BAU) scenario."

Finally, the impacts of ocean acidification on shelled organisms are described, with the conclusion that "the entire food web may also be at risk, which will gravely impact food security and employment opportunities. These effects of climate change, such as elevated water temperatures, have already had a severe impact on coral fauna, as seen through occasional coral bleaching events, such as the global events triggered by El Niño which, in 1998 killed approximately 16% of the world's coral, and occurred again in 2010, and in October 2015."

Although beyond the control of MSP, these threatening processes require long-term visions and plans that promote resilience in the WIO social-ecological system, and an ecosystem-based approach to MSP is required to secure the ecosystem services that the 60 million people in the WIO islands and Eastern Africa rely on so directly.

2.2 Guiding Principles for the Strategy

Drawing from the UN SDGs⁹⁴ and UNEP's proposed new Marine and Coastal Strategy (2020-2030)⁹⁵, as well as the policy handbook from the UN Economic Commission for Africa⁹⁶, this regional MSP Strategy is founded on the following guiding principles:

Strategy Guiding Principles

- An ecosystem-based approach to planning and management (including sustainable use)
- A Systems thinking approach
- A participatory, inclusive, broad-based and multi-stakeholder-based approach to policy formulation
- Recognition of the connectivity between EEZs and ABNJs (for both ecological and economic processes)
- A sound evidence base for decision-making with a strong science to policy interface
- Transparency and accountability throughout the MSP process (without this, the potential for blue growth in the region is limited, as is the potential to mitigate regional threats)
- Policy coherence at multiple levels (including with the SDGs)
- Cooperation at all levels (including within and between nations) that respects the sovereignty of each country in its EEZ
- Shared benefits and prosperity for all (recognising that the WIO is a common pool resource and MSP-related decisions made in one country affect others)

The first principle, an ecosystem-based approach, aims to manage human uses in an integrated and precautionary manner, and to address their cumulative impacts on marine and coastal ecosystem function at ecological scales, rather than at national scales. This also requires the effective management of freshwater and terrestrial ecosystems that are linked to marine and coastal ecosystem function. The intention of this approach is to address the shortfalls of traditional single-sector approaches and to provide a comprehensive, integrated approach to the management of human-ecosystem interactions. The ecosystem-based approach is expanded on in the text box below, and incorporates the twelve Malawi Principles⁹⁷ developed by the Convention on Biological Diversity.

⁹⁴ <https://sdgs.un.org/goals>

⁹⁵ <https://wedocs.unep.org/>

⁹⁶ United Nations Economic Commission for Africa (UNECA), 2016. Africa's Blue Economy: A policy handbook. United Nations Economic Commission for Africa, Addis Ababa, Ethiopia. Retrieved from www.uneca.org

⁹⁷ <https://www.cbd.int/ecosystem/principles.shtml>

The 12 Malawi principles of the Ecosystem-based approach

- Principle 1: Management objectives are a matter of societal choice.
- Principle 2: Management should be decentralised to the lowest appropriate level.
- Principle 3: Ecosystem managers should consider the effects of their activities on adjacent and other ecosystems.
- Principle 4: Recognizing potential gains from management there is a need to understand the ecosystem in an economic context, considering e.g. mitigating market distortions, aligning incentives to promote sustainable use, and internalising costs and benefits.
- Principle 5: A key feature of the ecosystem approach includes conservation of ecosystem structure and functioning.
- Principle 6: Ecosystems must be managed within the limits of their functioning.
- Principle 7: The ecosystem approach should be undertaken at an appropriate scale.
- Principle 8: Recognising the varying temporal scales and lag effects which characterize ecosystem processes, objectives for ecosystem management should be set for the long term.
- Principle 9: Management must recognise that change is inevitable.
- Principle 10: The ecosystem approach should seek the appropriate balance between conservation and use of biodiversity.
- Principle 11: The ecosystem approach should consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices.
- Principle 12: The ecosystem approach should involve all relevant sectors of society and scientific disciplines.

2.3 Systemic Theory of Change

2.3.1 Introduction to Theory of Change

The Theory of Change (ToC) approach, defined in the text box according to the Global Environmental Facility (GEF)⁹⁸, provides an explanation of the pathway from activities to outcomes, via particular mechanisms, causal links, assumptions, and enablers.

Defining Theory of Change:

“the process and the product of developing an explicit account of how and why an intervention is expected to achieve its intended outcome and impact goal, based on outlining a set of key causal pathways arising from the activities and outputs of the intervention... and the assumptions underlying these causal connections”

A key challenge is that ToCs are often presented in linear ways (Figure 8) that fail to explain the interactions between key elements⁹⁹ and inadequately address causal pathways and interlinkages and what possible unintended consequences could arise from the planned interventions¹⁰⁰.

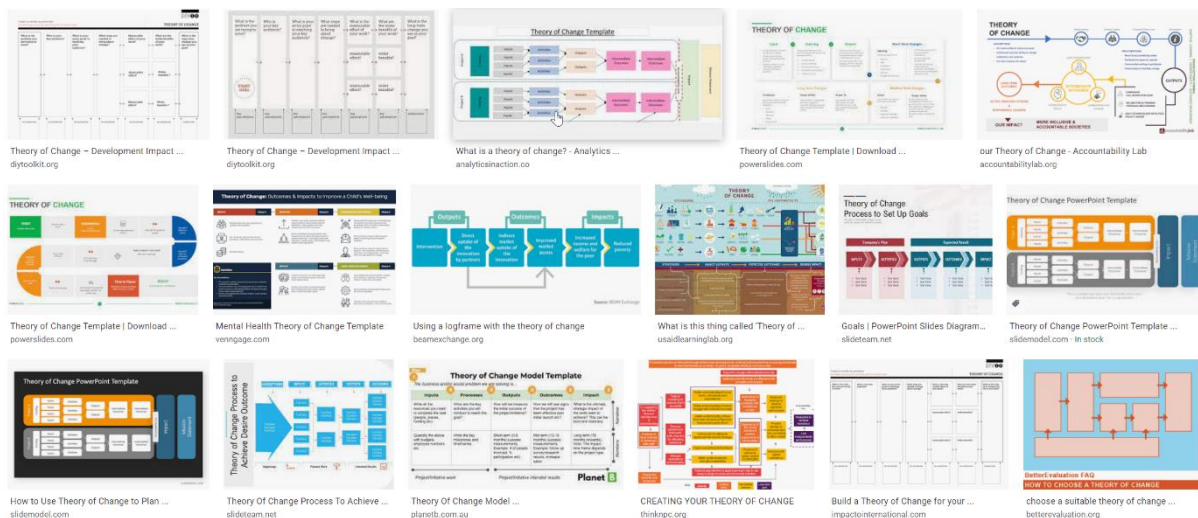


Figure 8. The first page of a google images search for ‘theory of change template’ (2 October 2021) illustrating common liner depictions.

⁹⁸ Global Environmental Facility (GEF), 2019. Theory of Change Primer: A STAP Document. Scientific and Technical Advisory Panel (STAP). GEF/STAP/C.57/Inf.04.

⁹⁹ Van Es, M., Guijt, I. and Vogel, I., 2015. Theory of change. Thinking in practice: A stepwise approach. Hivos, The Hague, The Netherlands (<http://www.hivos.org>).

¹⁰⁰ Green Climate Fund’s Independent Evaluation Unit (GCF IEU) evaluated the 93 proposals that had been approved for GCF funding by January 2019 (with a total value of USD\$ 16.22 Billion) and concluded that over 60% had inadequate ToCs (based on criteria against criteria including whether unintended consequences were referred to and whether causal pathways and linkages were clearly identified and discussed, with associated evidence. REF: Fiala, N., Puri, J. and Mwandri, P., 2019. Becoming Bigger, Better, Smarter: A Summary of the Evaluability of Green Climate Fund Proposals. Independent Evaluation Unit (IEU) Working Paper No. 1, Green Climate Fund (GCF). Songdo, South Korea.

A systemic theory of change aims to make explicit the causal links, mechanisms, assumptions and broader factors influencing and affecting a theory of change. Causal pathways are mapped graphically, with interventions showing what key stakeholders think it will take to effect changes in the system and attention paid to the possible unintended consequences of these interventions. Enabling factors in the broader contextual environment are noted alongside barriers and sources of change resistance.

2.3.2 Systemic Theory of Change

Figure 9 displays a systemic Theory of Change. The current (undesirable) situation is summarised in the points in the left-hand column of the diagram with the desirable alternatives detailed in the right-hand column. Each point can be read from left to right, from the dysfunctional current state to the desired future state. The way in which the regional MSP strategy can support moving from the current state to the desired future state is illustrated by the diagram in the centre of the Figure. The regional MSP strategy will support regional planning, which will then inform national planning. This national planning should, in-turn, influence future iterations of regional plans. Multiple capacities need to be developed to support this planning cycle. Four of the main capacities addressed in this strategy are (a) the capacity of stakeholders to engage in the process; (b) the institutional capacity to support the process; (c) human resources (HR) capacity to staff the process; and (d) technical capacity to provide the requisite expertise. These capacities rely on a regional-level enabling environment, which is illustrated by the outer ring of the central figure. Finally, blue triangle shows that regional marine planning and management should be underpinned by healthy marine ecosystems.

Figure 9 should be read in conjunction with the four systems diagrams in sections 8 and 9, which expand on the main interconnections between the strategic priorities and the way in which systemic approaches can support implementation of the strategy.

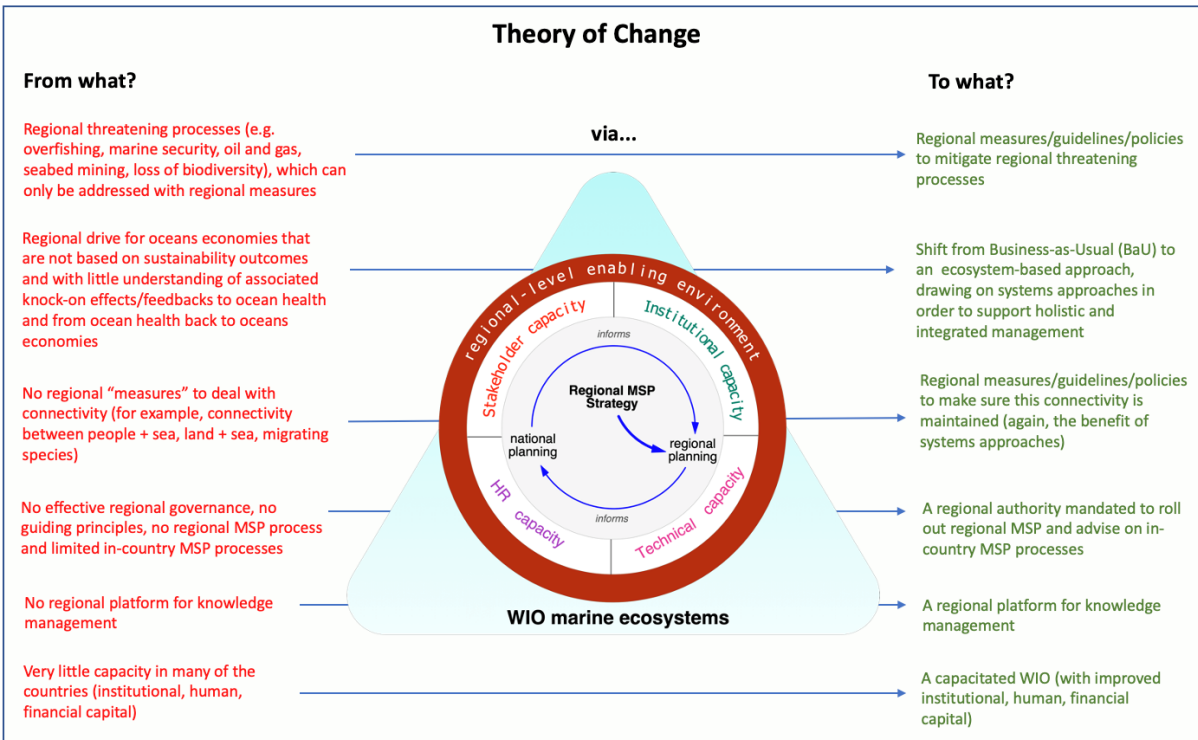


Figure 9. A systemic Theory of Change that can be adapted for the WIO MSP strategy.

3 Structure of the Strategy

Figure 10 illustrates the structure of this strategy, based on the stakeholder consultation process and contemporary literature.

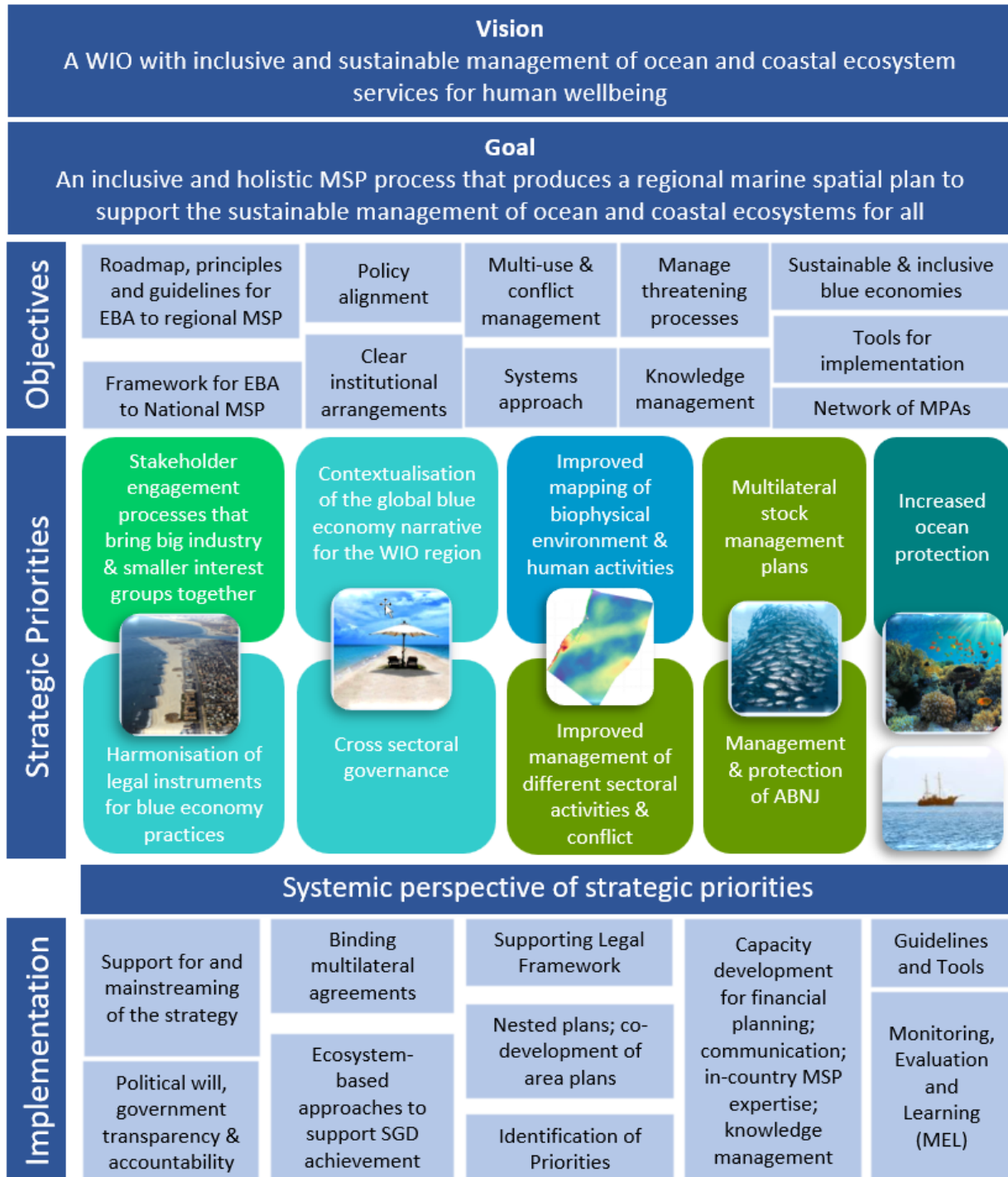


Figure 10. A structural view of a regional MSP strategy for the WIO.

4 Vision

Vision statements for the region suggested by the TWG and stakeholders are presented in Figures A5 and A6 (Appendix). Based on this input, Figure 10 shows the chosen vision statement is: “A Western Indian Ocean with inclusive and sustainable management of ocean and coastal ecosystem services for human wellbeing.”

5 Goal

Potential goals for a regional MSP process suggested by the TWG and stakeholders are presented in Figures A7 and A8 (Appendix). Based on this input, Figure 10 defines the goal as: “An inclusive and holistic MSP process that produces a regional marine spatial plan to support the sustainable management of ocean and coastal ecosystems for all.”

6 Objectives

This regional strategy addresses step one of a three step process (see Figure 11). These steps are:

1. Develop a regional marine spatial planning strategy
2. Begin a regional marine spatial planning process
3. Develop a regional marine spatial plan

Potential objectives for the three steps, as suggested by the TWG, stakeholders and contemporary literature, are presented Figure 11. They are also summarised in Figures 10 (as blue text boxes adjacent to the heading “Objectives”). Specific literature that informed the objectives included the Cairo Declaration of 2015¹⁰¹, the African Union’s Blue Economy Strategy¹⁰², and the United Nations Economic Commission for Africa’s Blue Economy handbook¹⁰³.

Figure A9 (Appendix) shows the frequency distribution of survey responses per objective, whereas Figure A10 (Appendix) shows the weighted ranking of survey responses for all objectives. Responses showed that the provision of guidelines and best practice was ranked the highest based on individual survey responses. This was followed by the provision of a systematic framework for MSP, mechanisms to address transboundary issues, the sustainable harnessing of blue growth opportunities, and the alignment of policy for regional implementation and sustainable development. These objectives had a weighted ranking of more than 50%. Other objectives identified were the need to articulate clear institutional arrangements for sustained collaboration and coordination, the provision of a standardised framework for data collection and sharing, support for collaboration between WIO countries, the provision of knowledge and financing arrangements for implementation, and the development of principles for national and regional MSP.

¹⁰¹ https://www.un.org/en/africa/osaa/pdf/au/cap_naturalcapital_2015.pdf. The Cairo Declaration agrees that African States will develop an ocean governance strategy in accordance with UNCLOS, the Regional Seas Conventions, and the African Union’s AIMS and Agenda 2063

¹⁰² AU-IBAR, 2019.

¹⁰³ UNECA, 2016.

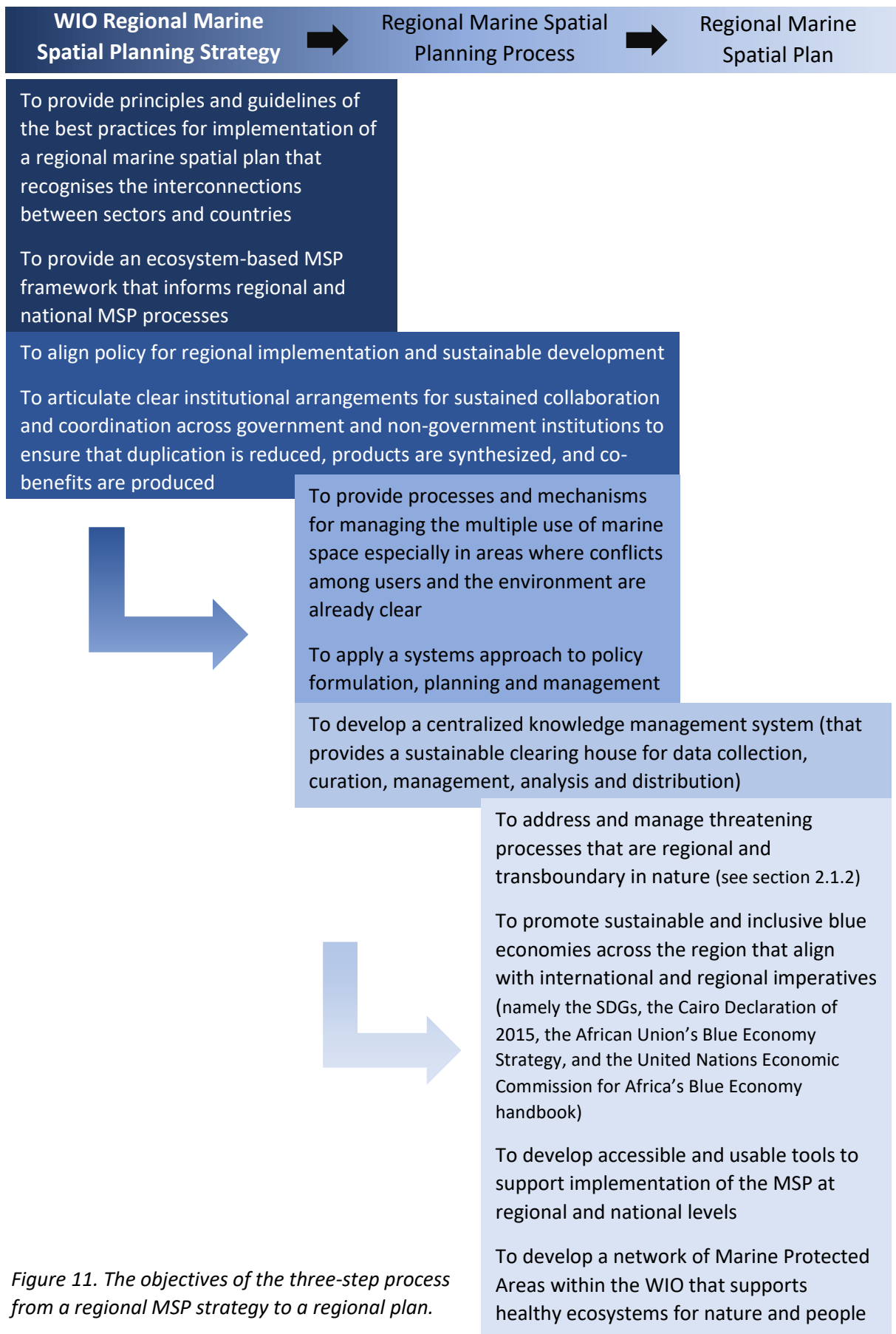


Figure 11. The objectives of the three-step process from a regional MSP strategy to a regional plan.

7 Strategic priorities

Strategic priorities to be addressed by a regional MSP process were identified by the TWG and other stakeholders (Figure 10). Improved mapping of the biophysical environment and human activities received the highest ranking of survey responses, followed by nine other priorities. These have been grouped into thematic areas (rather than in order of ranking) and are summarised in the text box below.

Strategic Priorities

Priority for the process to be followed:

1. A stakeholder engagement process that brings both big industry and smaller interest groups to the table

Priorities for Governance:

2. Cross sectoral governance
3. Harmonisation of legal instruments for blue economy practices (with a focus on oil and gas, energy and fisheries)
4. Contextualise the global blue economy narrative for the WIO region

Priority for immediate action:

5. Improved mapping of biophysical environment and human activities

Priorities for management:

6. Improved management of different sectoral activities and conflict
7. Multilateral stock management plans
8. Management of Areas Beyond National Jurisdiction

Priority outcome:

9. Increased ocean protection, including Marine Protected Areas (MPAs), Ecologically and Biologically Significant Areas (EBSAs) and Areas Beyond National Jurisdiction (ABNJs)

Figure A11 (Appendix) shows that respondents mentioned “increased protection” for the ocean in three different strategic priorities, namely “increased ocean protection for EBSAs” (ranked 4th), “increased ocean protection” in general (ranked 7th), and “management and protection of ABNJ (ranked 10th). Worth noting is the recent publication of the MPA Outlook¹⁰⁴. Data from this publication show that the % of EEZ with some form of protection varies greatly across WIO countries (Figure 12). Note that these data do not differentiate between strict (no-take/sanctuary) protection and multiple use areas.

¹⁰⁴ UNEP (United Nations Environment Programme)–Nairobi Convention and WIOMSA (Western Indian Ocean Marine Science Association), 2021. Western Indian Ocean Marine Protected Areas Outlook: Towards achievement of the Global Biodiversity Framework Targets. UNEP and WIOMSA, Nairobi, Kenya, 298 pp.

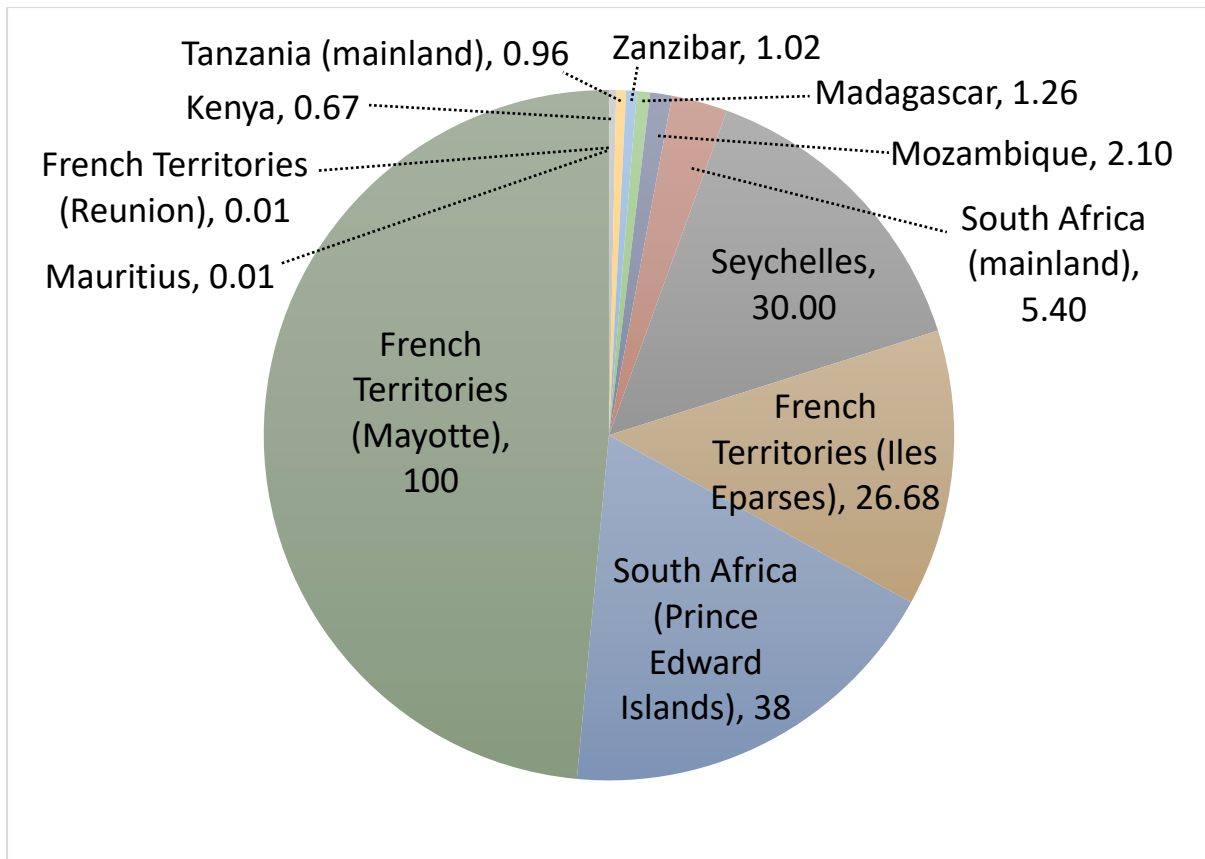


Figure 12. Percentage of Exclusive Economic Zone in marine protected areas (MPAs), within countries of the Western Indian Ocean. Note that these data do not differentiate between strict (no-take/sanctuary) protection and multiple use areas. Data from MPA Outlook¹⁰⁵.

To assess levels of strict protection, it is recommended that future iterations of MPA assessments categorise MPAs according to the newly published MPA Guide¹⁰⁶. It is widely understood that only strict protection provides the full benefits of ocean protection mechanisms^{107,108}. The different types of non-formal protection currently used in the WIO region are summarised in Table 2.

¹⁰⁵ UNEP–Nairobi Convention and WIOMSA, 2021. Marine Protected Areas Outlook.

¹⁰⁶ Grorud-Colvert, K., Sullivan-Stack, J., Roberts, C., Constant, V., Horta e Costa, B., Pike, E.P., Kingston, N., Laffoley, D., Sala, E., Claudet, J. and Friedlander, A.M., 2021. The MPA Guide: A framework to achieve global goals for the ocean. *Science*, 373(6560), p.eabf0861.

¹⁰⁷ Roberts, C.M., O’Leary, B.C., McCauley, D.J., Cury, P.M., Duarte, C.M., Lubchenco, J., Pauly, D., Sáenz-Arroyo, A., Sumaila, U.R., Wilson, R.W. and Worm, B., 2017. Marine reserves can mitigate and promote adaptation to climate change. *Proceedings of the National Academy of Sciences*, 114(24), pp.6167-6175.

¹⁰⁸ Edgar, G.J., Stuart-Smith, R.D., Willis, T.J., Kininmonth, S., Baker, S.C., Banks, S., Barrett, N.S., Becerro, M.A., Bernard, A.T., Berkhout, J. and Buxton, C.D., 2014. Global conservation outcomes depend on marine protected areas with five key features. *Nature*, 506(7487), pp.216-220.

Table 2. Non-formal protection measures currently implemented in the WIO region (data from MPA Outlook¹⁰⁹).

Areas under non-formal protection	
Comoros	None mentioned
French territories	None mentioned
Kenya	Other Effective area-based Conservation Measures (OECM); Community conservation areas; Locally Managed Marine Areas (LMMAs); Beach Management Units
Madagascar	Locally Managed Marine Areas (LMMAs)
Mauritius	Voluntary Marine Conservation Areas (VMCAs)
Mozambique	Non-formal protected areas; Community Sanctuaries
Seychelles	Voluntary MPAs
South Africa	Fishery Protection Zones; Trawler Exclusion Areas
Tanzania	Collaborative Fisheries Management Areas; Collaborative Management Areas
Zanzibar	Community closures or management zones

¹⁰⁹ UNEP–Nairobi Convention and WIOMSA, 2021. Marine Protected Areas Outlook.

8 Systemic perspective on strategic priorities

This section presents a systemic perspective on the strategic priorities. The WIO MSP should aim to drive positive outcomes and minimise negative outcomes, by understanding the complex and interconnected nature of marine social-ecological systems in the region. A systemic approach helps make explicit the trade-offs between policies and desired outcomes, showing where policies can constrain or conflict with one another, versus how they can reinforce and support one another. The objective is to achieve synergies and co-benefits and to minimise undesirable trade-offs.

The systemic perspective on the strategic priorities is presented with reference to three systems diagrams (Figures 13 – 15), which build on one another to provide a systems picture that is based on the diagrammatic conventions (depictions) of causal loop diagrams, drawn from the field of system dynamics modelling¹¹⁰. Figure 13 is a high-level causal loop diagram (CLD) with a key to the particular diagrammatic conventions and the five feedback loops, which are further explained in the following text.

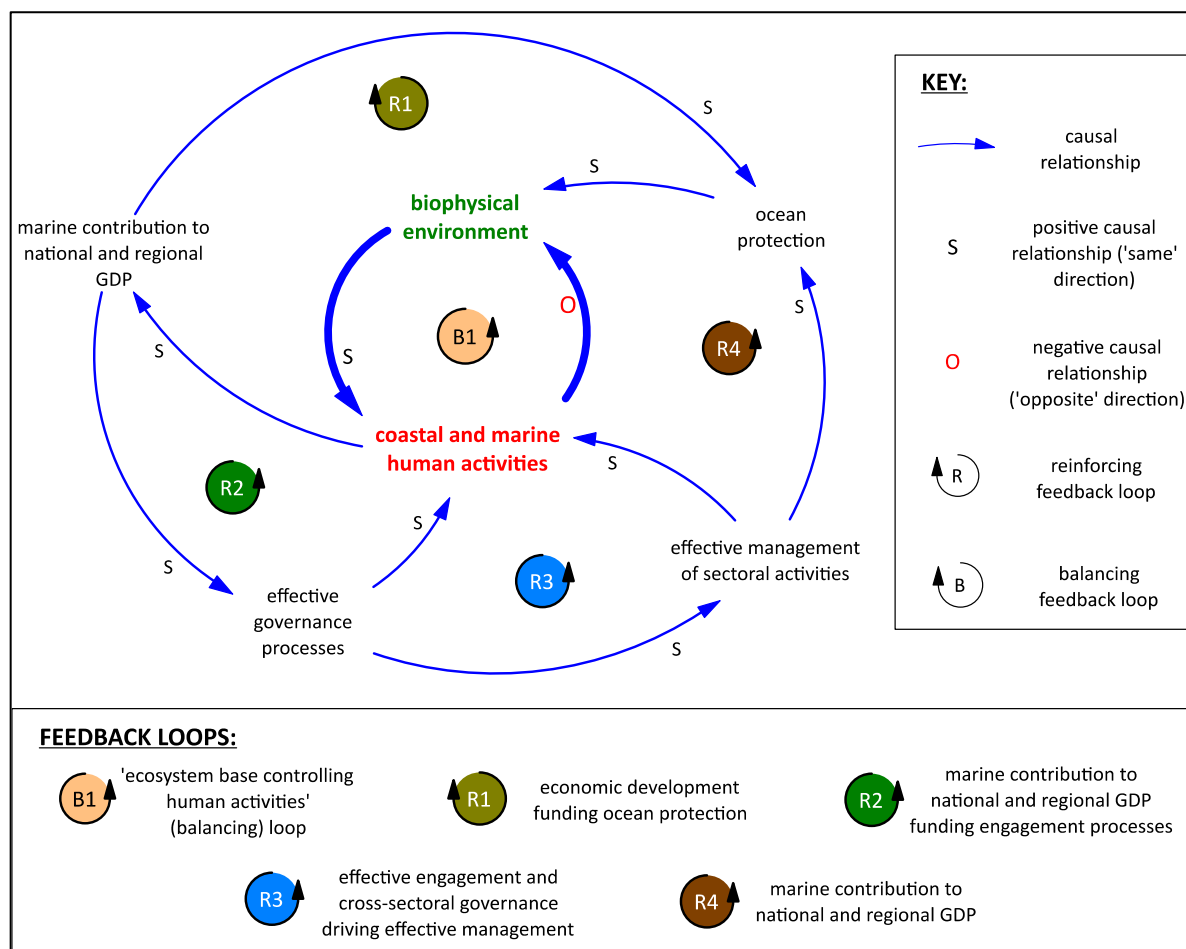


Figure 13: High-level causal loop diagram (CLD) showing the primary connections between strategic priorities (R = reinforcing feedback loop; B = balancing/counteracting feedback loop).

¹¹⁰ Ford, A., 2009. Modeling the Environment. Second ed. Washington D.C.: Island Press.

The first feedback loop is a balancing loop (**B1**) that shows how coastal and marine human activities rely on the ecosystem services provided by a functional biophysical environment. If the biophysical environment is stable or improving, then coastal and marine human activities can be sustained and/or increased. This relationship is illustrated by the letter 's' on the arrow between the two variables, which is short for 'same' direction (note that mathematically, this 's' is a positive causal relationship). However, there are fundamental limits to growth, because those same coastal and marine human activities influence the biophysical environment. While some activities are non-consumptive, the majority are consumptive, i.e. they consume resources. For this reason, the arrow between the two variables has an 'O' on the arrow, short for 'opposite' direction (which is mathematically a negative relationship).

Coastal and marine human activities generate value, some of which is captured in the form of revenue that contributes to national and regional GDP. The greater the marine contribution, the more ocean protection can be afforded. The more ocean protection, the more the biophysical environment can be restored and maintained, which supports further coastal and marine human activities, forming the first reinforcing feedback loop (**R1**). Depending on the initial conditions of either an improving or declining state, this reinforcing feedback loop can either be a virtuous cycle, which is desirable, or a vicious cycle, which is undesirable.

The second reinforcing feedback loop (**R2**) is generated by marine contributions to GDP enabling more effective governance processes, which enable further coastal and marine human activities. Note that both **R1** and **R2** operate off of certain assumptions, chiefly that increases in the marine contribution to GDP will be allocated to fund ocean protection (**R1**) and to fund governance processes (**R2**) and will not be significantly depleted by elite capture and/or other government functions or expenses.

More effective governance processes will drive more effective management of sectoral activities, which will enable trade-offs to be facilitated and synergies and co-benefits between sectors to be achieved. This will further increase coastal and marine human activities, creating the third reinforcing feedback loop (**R3**).

Effective management of sectoral activities will also drive ocean protection, increasing the state of the biophysical environment and in so doing, enable further coastal and marine human activities (**R4**).

Figure 14 expands on the high-level CLD (Figure 13), adding three new variables and three additional feedback loops. Governance processes are divided into two variables in Figure 14: effective stakeholder engagement processes (**R2**) and effective cross-sectoral governance (**R5**). The more effective cross-sectoral governance, the less inter-sectoral conflict (hence the 'O' between the two variables). Less inter-sectoral conflict will have an inverse effect on the effectiveness of stakeholder engagement processes (given that inter-sectoral conflict reduces the efficacy of stakeholder engagement processes, a decline in conflict will have an opposite effect on stakeholder engagement). The more effective stakeholder engagement processes the more effective cross-sectoral governance should become, forming the sixth feedback loop (**R6**). The reality is that an increase in coastal and marine human activities will generally lead to greater competition between sectors. Hence, an increase in these activities drives an increase in the potential inter-sectoral conflict. The higher the potential for conflict, the more likely it is that inter-sectoral conflict will occur. Given the causality described in **R6**, an increase in inter-sectoral conflict will reduce the efficacy of stakeholder engagement processes, which in turn will reduce human activities both directly and indirectly, via cross-sectoral governance and the management of sectoral activities. This forms the second balancing loop (**B2**). Note that the same dynamics apply to transboundary conflict as they do to inter-sectoral conflict.

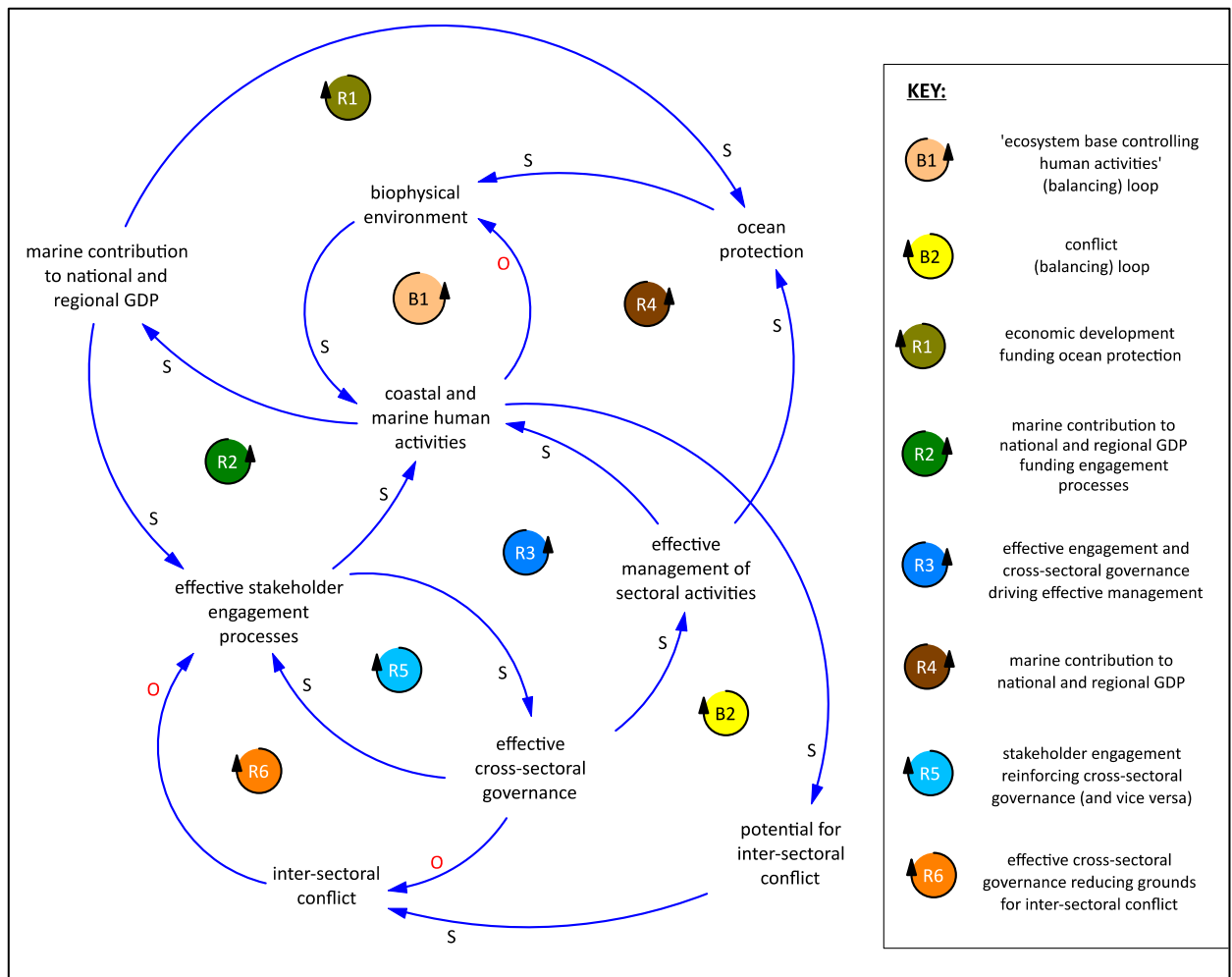


Figure 14: Expanded CLD (v.1), illustrating a systemic perspective of the strategic priorities.

Figure 15 below expands on Figure 14 by showing the points at which particular activities have leverage upon the system. Six points are shown in Figure 15, driven by the *italicised variables* in green boxes. Ocean protection would be increased by stock management planning, protecting Ecologically and Biologically Significant Areas (EBSAs) and protecting Areas Beyond National Jurisdiction (ABNJs). Cross-sectoral governance would become more effective by harmonising legal instruments. Mapping of the biophysical environment and of the coastal and marine human activities would be another strategic leverage point. Finally, contextualising the global blue economy narrative for the WIO will help make the most of the marine contributions to national and regional GDP, as noted in the reinforcing feedback loops **R1** and **R2**.

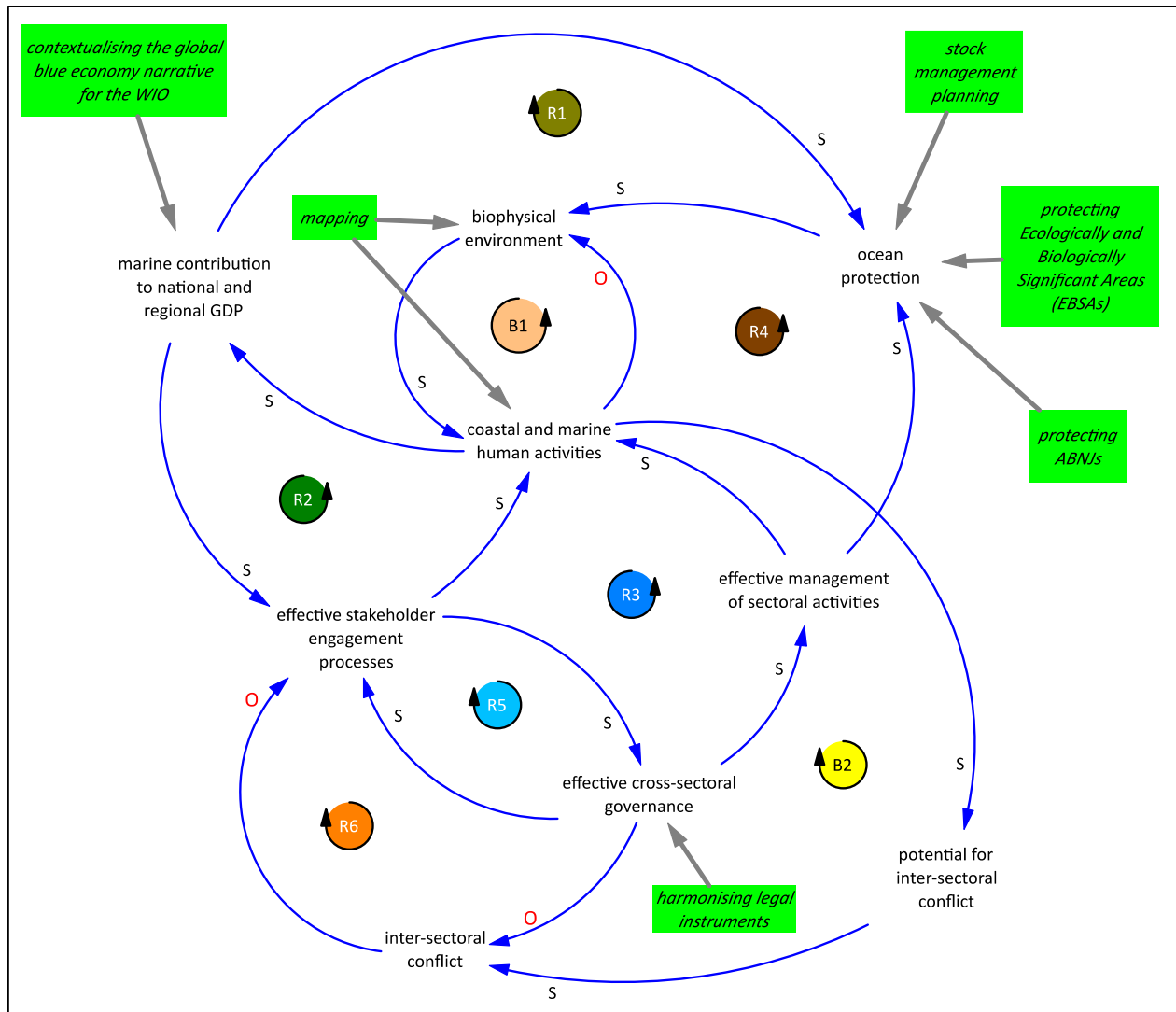


Figure 15: Expanded CLD (v.2) showing select key leverage points (variables italicised in green boxes) in relation to the strategic priorities.

9 Implementation

Effective implementation of a regional MSP strategy for the WIO will require significant commitment and investment from member countries and funding agencies. It will also require a shift from business-as-usual approaches to innovative and adaptive new approaches. Here we recommend global best-practice examples from regional MSP initiatives. There is no one-size-fits-all best practice, as each region has unique characteristic in governance and social-ecological systems. A regional MSP must thus be fit-for-purpose, but the examples below are drawn from vastly different regions and each offers many lessons for regional MPS initiatives.

We also examine the survey responses from the TWG and stakeholders regarding enabling mechanisms to develop and implement MSP. Following on from section 8, we then present a systemic perspective of a regional MSP process, showing where intervention points are positioned. We end the section with feedback from the TWG and stakeholders regarding potential funding sources to begin the implementation of this strategy.

9.1 Global best practice for regional MSP

Section 2.5 on “Regional progress towards MSP in the WIO” in the accompanying Situational Report¹¹¹ to this Strategy discusses good practices for regional MSP and lists the characteristics that are shared by most successful regional plans (based on WWF 2014)¹¹², namely:

1. Clear legal authority to undertake MSP
2. Strong political leadership
3. Adequate financing to complete at least a first round of MSP
4. Effective stakeholder engagement throughout the MSP process
5. Clear, measurable management objectives
6. Use of best available information, including local and traditional knowledge, in the analysis phase of MSP

Good practices that encourage cross-border cooperation in MSP include the following¹¹³:

- Good practice 1: Invest in a deep understanding of the existing governance system
- Good practice 2: Invest time and resources during the MSP processes in building trust and a sense of common purpose among all parties involved
- Good practice 3: Adopt an issue-driven approach to MSP
- Good practice 4: Adopt a long-term perspective
- Good practice 5: Manage expectations for stakeholder involvement
- Good practice 6: Design monitoring and evaluation system that analyses program performance, learning and progress towards goals over the long term

¹¹¹ UNEP–Nairobi Convention, WIOMSA, Nelson Mandela University, and Macquarie University, 2021. Situational report.

¹¹² World Wide Fund for Nature (WWF), 2014. A global review of marine spatial planning: 2014 update. Internal report prepared by C. Ehler for the World Wildlife Fund (WWF) UK, 103pp.

¹¹³ Carneiro, et al., 2017.

Examples of best practice regional MSP processes are provided in Table 3.

Table 3. Examples of best practice regional MSP processes.

Best practice examples for regional MSP across nations		
Baltic Sea	Baltic Marine Environment Protection Commission (Helsinki Commission - HELCOM)	www.helcom.fi
Coral Triangle	Coral Triangle Initiative	www.coraltriangleinitiative.org
Mediterranean	UNEP-Barcelona Convention	www.unep.org/unepmap/
South East Atlantic	Benguela Large Marine Ecosystem (BCLME) MARISMA	www.benguelacc.org/index.php/en/marisma
South-Western Indian Ocean	Ocean Metiss Project (France/Reunion)	www.oceanmetiss.re
Best practice examples for regional MSP within nations		
Canadian North Pacific	Marine Plan Partnership for the North Pacific Coast (MaPP)	mappocean.org
Finland	MSP for Finland	https://www.merialuesuunnittelu.fi/wp-content/uploads/2020/10/Ecosystem-based-approach-in-Finnish-MSP.pdf
United Kingdom	United Kingdom Government	https://www.gov.uk/guidance/marine-plans-development .
USA (New England)	Northeast Regional Ocean Council (NROC)	neoceanplanning.org/plan
USA (Mid East coast)	Mid-Atlantic Regional Planning Body (RPB)	roa.midatlanticocean.org
USA (Massachusetts)		https://www.mass.gov/service-details/massachusetts-ocean-management-plan
Best practice examples of MSP globally		
Global	Blue Solutions	bluesolutions.info/capacity-development/blue-planning-practice

In addition to Table 3, MSPglobal2030 (www.mspglobal2030.org/msp-global) is developing guidance on international cross-border planning. MSPglobal is a joint initiative by UNESCO's Intergovernmental Commission (IOC-UNESCO) and the European Commission's Directorate for Maritime Affairs and Fisheries (DG MARE) to develop new guidelines on Maritime Spatial Planning. Action 1 is to developing guidance on transboundary MSP: "Ongoing MSP transboundary initiatives, especially cooperation between responsible national agencies, have contributed to increasing knowledge, experience and data sharing among neighbouring countries. They have helped building capacity or even triggered a political drive in certain countries. Based on these experiences, IOC-UNESCO and DG MARE will aim at developing, together with the involvement of their Member States and other UN agencies, guidance to facilitate the implementation of transboundary MSP."

9.2 Enabling mechanisms to implement the strategy

Enabling mechanisms to implement the regional strategy are summarised in Table 4 and Figure 10. Material was drawn from both the stakeholder process (summarised in Figures A12-A13, Appendix), as well as the contemporary literature.

Table 4. Enabling mechanisms to implement the regional WIO MSP strategy.

Political support for implementation of the Strategy	To implement the regional MSP strategy, political will from WIO countries will be required at the highest level, through binding multilateral agreements. These agreements need to include mechanisms that ensure individual government transparency, measures of accountability, and agreed upon non-compliance mitigation strategies.
Supporting legal framework	Development of an overarching legal framework is required, in keeping with UNCLOS and country EEZ management. This will require harmonisation of strategic priorities towards an ecosystem-based approach for human wellbeing and towards achieving the SDGs.
Nested plans	A nested approach to MSP can allow plans to become detailed at a finer scale within each country. Detailed plans, required at the EEZ level, should be guided by the regional strategy's principles, vision, goals, objectives and strategic priorities. All plans (irrespective of scale) should use the best available scientific data and adopt a precautionary approach. There is a need to develop clear science to policy pathways in support of marine plan development.
Co-development of area plans	Development and implementation of marine spatial plans requires co-development and integration of knowledge systems from the outset and at each step. Stakeholder engagement at each step is crucial to implementation success.
Identification of priorities	Countries still in the process of developing frameworks and legislation for MSP should be prioritised. Data gaps for the region should be identified and strategies should be developed to fill these data gaps. In particular, priority issues such as overfishing, maritime security, climate impacts and pollution should be addressed. Research priorities for regional issues should be identified and addressed through cross-country collaborations.
Capacity development	Implementation will require capacity development from local to regional, to interpret and apply the regional strategy within country spatial plans. This will include: <ul style="list-style-type: none"> (i) Financial planning and funding; (ii) Communication and awareness planning; (iii) MSP capacity development strategies for each country; and (iv) Data acquisition and management strategies.
Guidelines and tools	MSP development and implementation guidelines are required, including reference to training opportunities and the use of the co-developed tools, for example, WIO Symphony – a tool for ecosystem-based MSP ¹¹⁴ . There is a need for other bespoke tools for the region that can help with the MSP process and marine and coastal management. Systems approaches can assist at all steps of MSP processes, as well as with management decisions and conflict resolution. The increased use of the Oceans Accounting Framework is recommended. Technological innovations can assist with information gathering, storing, dissemination, monitoring, compliance, communication, etc.

¹¹⁴ <https://www.havochvatten.se/en/eu-and-international/marine-spatial-planning/symphony---a-tool-for-ecosystem-based-marine-spatial-planning.html>

Monitoring, Evaluation and Learning (MEL)	Marine spatial plans are not static; adaptation and adjustments will be required, particularly for inclusion in an adaptive and dynamic ocean governance framework. Therefore, metrics are required to monitor the progress of development and implementation of national and regional plans. It is therefore recommended that a MEL body is set up.
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9.3 A systemic perspective for implementation

This sub-section locates the enabling mechanisms to support implementation, introduced above, in relation to the system diagram that was unfolded in three stages in Section 8. In Figure 16, below, effective stakeholder engagement processes are shown as needing to be driven by a combination of **political will** and **financial planning and funding to support national and regional MSP processes**. The importance of **knowledge management systems** is shown in a several places: firstly, with the mapping of the biophysical environment and the coastal and marine systems, and secondly, to support the effective management of sectoral activities. The knowledge management systems will be enabled by the **development of data acquisition and management capacity** and by **tools and technology**, including decision-making and decision support tools. These tools and technology will additionally support stock management planning. The increasing use of **the Oceans Accounting Framework** will also support the protection of EBSAs and ABNJs, as well as stock management planning. **Binding multilateral agreements** are a second enabling mechanism for protecting EBSAs and ABNJs. These multilateral agreements will perform multiple functions, including reducing the potential for inter-sectoral conflict and supporting effective cross-sectoral governance. The **development of an overarching legal framework (or frameworks)** will support and enable these binding multilateral agreements and provide an opportunity to harmonise legal instruments in the region, but requires significant **political will**. Two final enabling mechanisms illustrated in Figure 16 below are (i) **mechanisms for conflict resolution**, which would reduce the potential for inter-sectoral conflict and (ii) **identification of priorities**, in the form of data gaps and priority regional issues, which is a necessary step in the effective management of sectoral activities in the WIO.

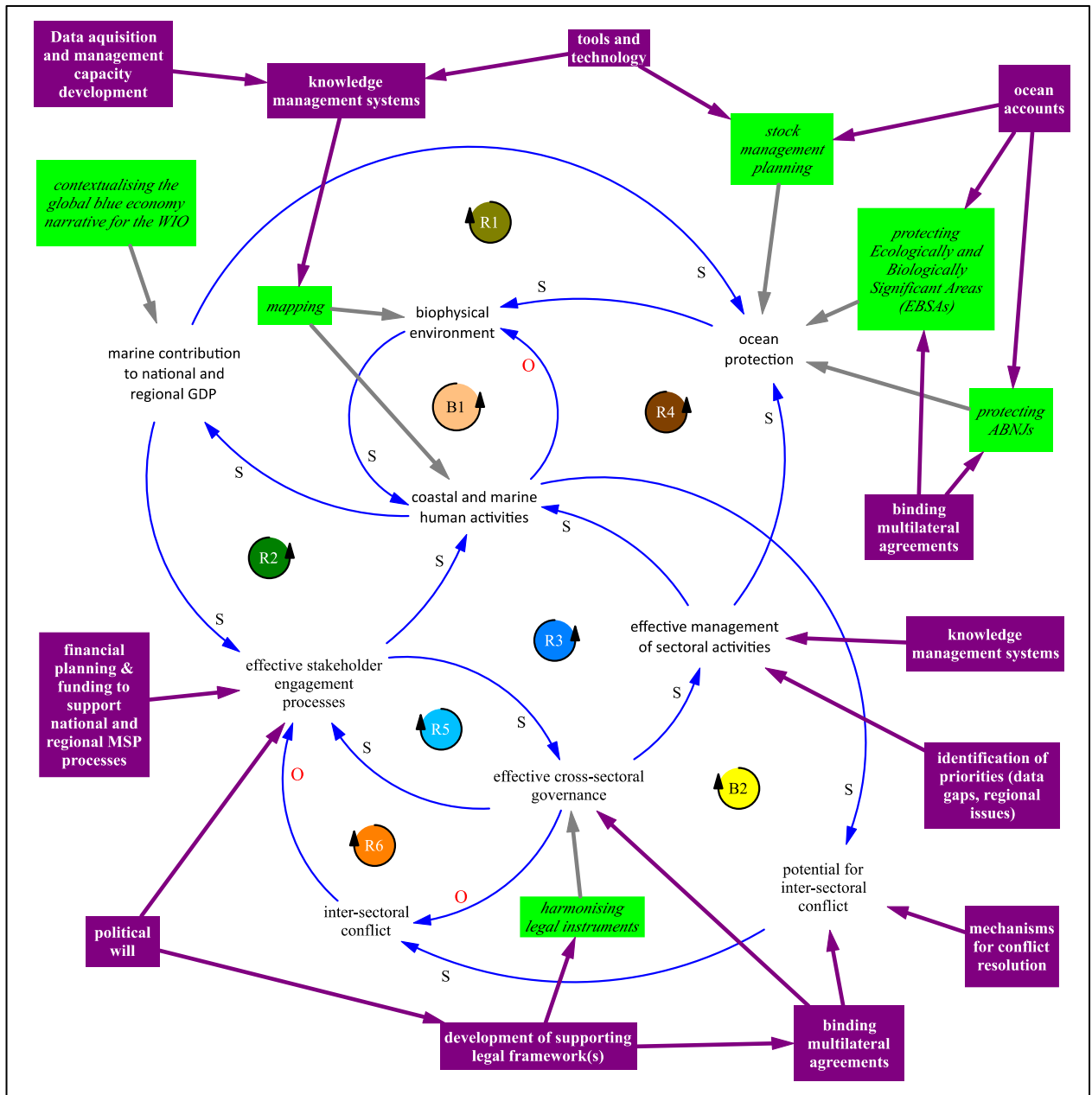


Figure 16: Expanded CLD (v.3), with enabling mechanisms shown in relation to leverage points in the system of the strategic priorities. The purple arrows show the points at which the enabling mechanisms influence the system.

9.4 Sources of funding

The main funding sources recommended during the stakeholder engagement process are illustrated in Figure 17. Additional recommended sources are provided in the Appendix (Figure A14). Most recommended donors are the large internationals such as the GEF and the UNEP, while National Governments ranked third. Interestingly, the private sector and innovative financing mechanisms (e.g. taxes from shipping/levying taxes on access to resources and use of marine space) remain relatively unexplored, emphasising the common pool resource burden carried by the marine environment.

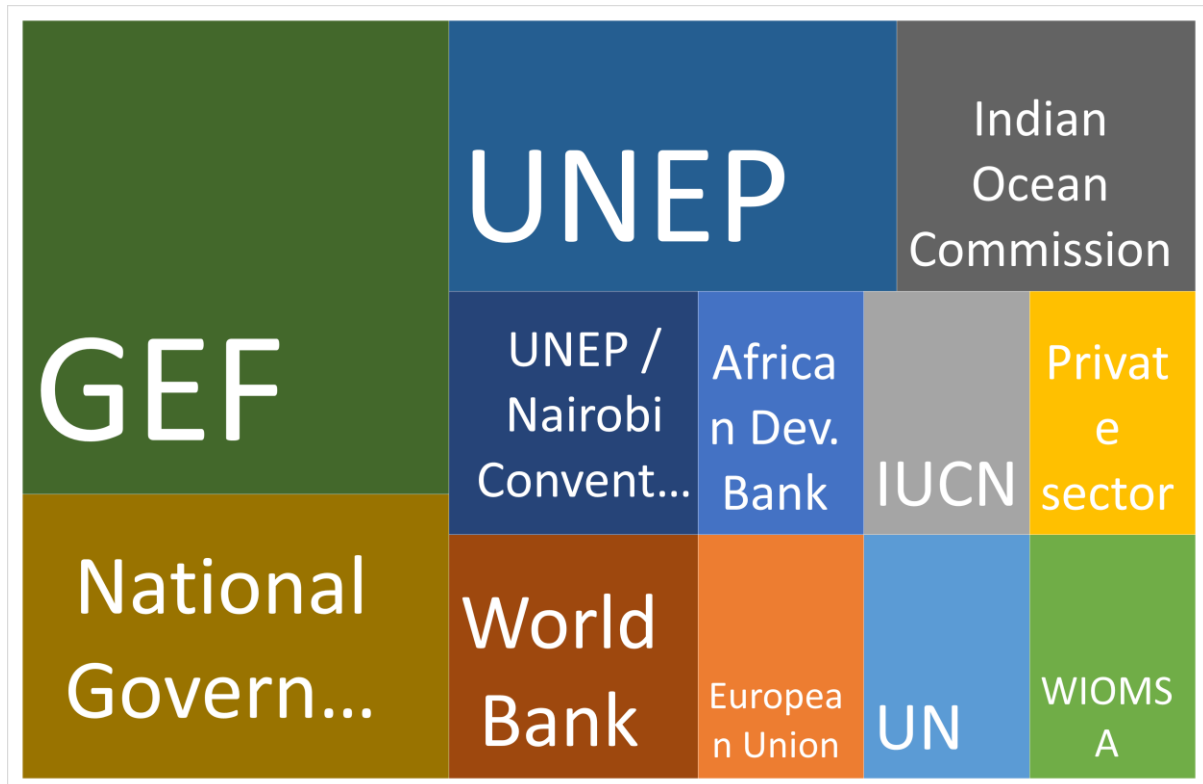


Figure 17. The top 12 funding sources recommended by stakeholders to fund the implementation of the regional MSP strategy.

10 MSP guidance for Countries and the WIO Region

Ecosystem-based MSP processes have been conducted within countries and across regions. These processes have fundamental steps in common and can be adapted to be context specific. Two examples are provided here: the IOC-UNESCO¹¹⁵ guide that can be applied at any scale; and the MSP process developed by the Marine Management Organisation of the UK¹¹⁶. Many additional examples of MSP processes exist, with many online resources to assist nations and regions to craft their own processes and implementation strategies. A selection of these is provided in Table A1 in the Appendix. From these examples and resources, a recommended regional MSP process for the WIO is provided in section 10.3 below.

10.1 IOC-UNESCO

In 2009 the Intergovernmental Oceanographic Commission (IOC) of the UN Educational, Scientific and Cultural Organisation (UNESCO) published a step-by-step approach toward ecosystem-based management in MSP¹¹⁷ (Figure 18). These steps form a sound basis and can be applied in any location at any scale. It is critical to note that these steps form part of a continuing process and this process needs time, and continuous stakeholder participation. Stakeholders also need the power to be able to impact this process. Weak stakeholder engagement processes almost always lead to failure at the implementation stage.

¹¹⁵ Ehler, C. and Douvère, F., 2009. Marine Spatial Planning: a step-by-step approach toward ecosystem-based management. Intergovernmental Oceanographic Commission and Man and the Biosphere Programme. IOC Manual and Guides No. 53, ICAM Dossier No. 6. Paris: UNESCO.

¹¹⁶ <https://www.gov.uk/guidance/marine-plans-development>

¹¹⁷ Ehler and Douvère, 2009.

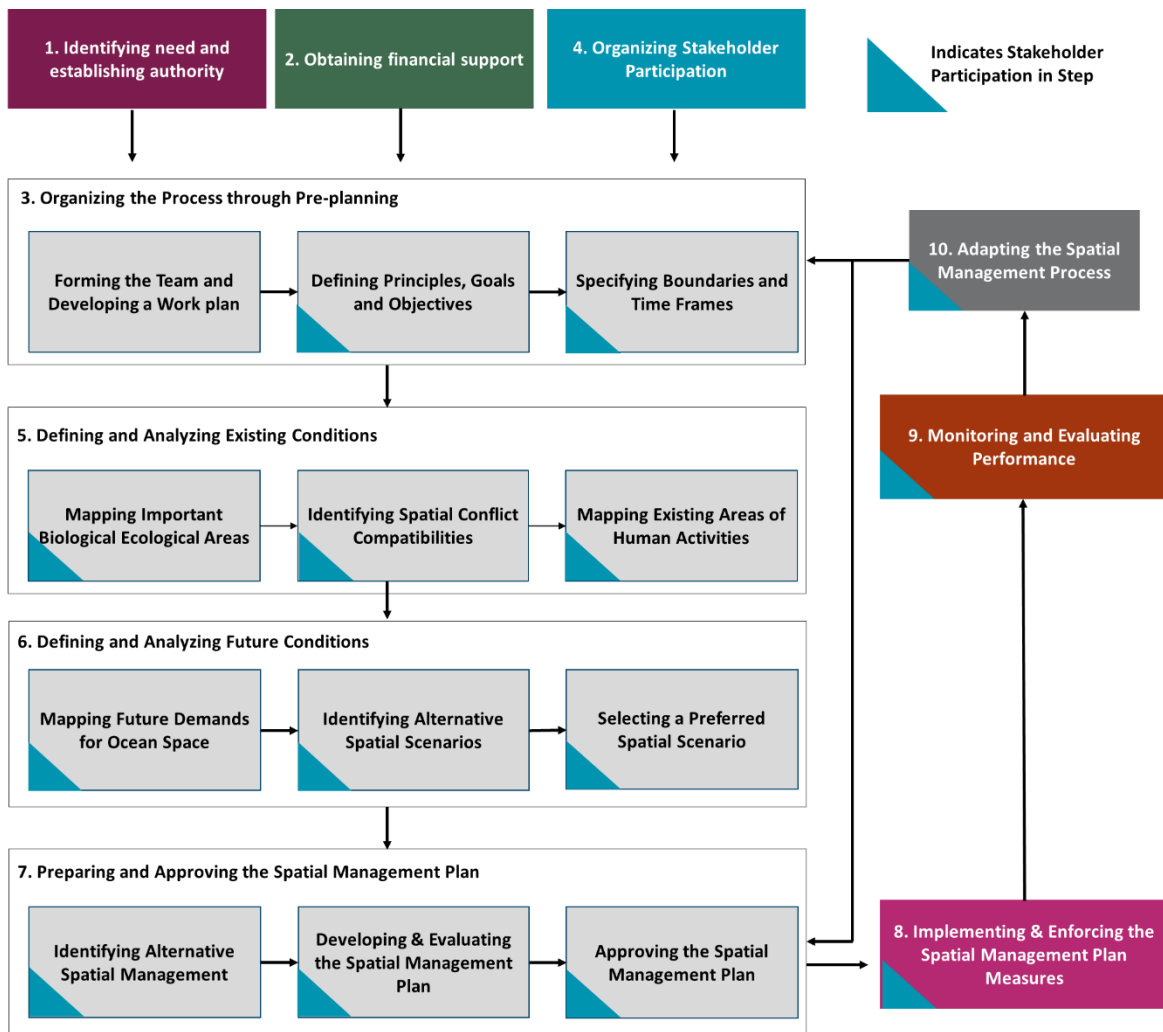


Figure 18. A step-by-step approach to MSP (adapted from Ehler and Douvere 2009)¹¹⁸.

¹¹⁸ Ehler and Douvere, 2009.

Table 5 provides a clear outline of the outputs expected from each of the steps. Again, these outputs are relevant for regional as well as national MSP processes.

Table 5. Outputs generated by each of the 10 steps in Figure 18 (adapted from Ehler and Douvere 2009)¹¹⁹.

Step	Task	Outputs
1. Identifying need and establishing authority	Identifying why you need marine spatial planning	A preliminary list of specific problems you want to solve through marine spatial planning
	Establishing appropriate authority for marine spatial planning (for both the planning and implementation phases)	A decision about what kind of authority you need for developing marine spatial planning (both the planning and implementation phases)
2. Obtaining financial support	Identifying alternative financing mechanisms	A financial plan that: a. Estimates the costs of your MSP activities and b. Identifies alternative means to obtain financing for those MSP activities
	Defining the feasibility of alternative funding mechanisms	
3. Organizing the process through pre-planning	Creating the marine spatial planning team	Organization of a marine spatial planning team with the desired skills
	Developing a work plan	A work plan that identifies key work products and resources required to complete the outputs of planning on time
	Defining boundaries and timeframe	Defined boundaries & time frame for analysis and management
	Defining principles	A set of principles to guide development of the marine spatial management plan
	Defining goals and objectives	A set of goals and objectives for the management area
	Identifying risks and developing contingency plans	
4. Organizing stakeholder participation	Defining who should be involved in marine spatial planning	A plan indicating who, when and how to involve stakeholders throughout the marine spatial planning process
	Defining when to involve stakeholders	
	Defining how to involve stakeholders	
5. Defining and analyzing existing conditions	Collecting and mapping information about ecological, environmental and oceanographic conditions	An inventory and maps of important biological and ecological areas in the marine management area
	Collecting and mapping information about human activities	An inventory and maps of current human activities (and pressures) in the marine management area
	Identifying current conflicts and compatibilities	An assessment of possible conflicts and compatibilities among existing human uses; An assessment of possible conflicts and compatibilities between existing human uses and the environment
6. Defining and analyzing future conditions	Projecting current trends in the spatial and temporal needs of existing human activities	A trend scenario illustrating how the MSP area will look if present conditions continue without new management interventions
	Estimating spatial and temporal requirements for new demands of ocean space	
	Identifying possible alternative futures for the planning area	Alternative spatial sea use scenarios illustrating how the management area might look when

¹¹⁹ Ehler and Douvere, 2009.

		human activities are redistributed based on new goals and objectives
	Selecting the preferred spatial sea use scenario	A preferred scenario that provides the basis for identifying and selecting management measures in the spatial management plan
7. Preparing and approving the spatial management plan	Identifying alternative spatial and temporal management measures, incentives, and institutional arrangements	An identification and evaluation of alternative management measures for the spatial management plan
	Specifying criteria for selecting marine spatial management measures	Identification of criteria for selecting alternative management measures
	Developing the zoning plan	A comprehensive management plan, including if needed, a zoning plan.
	Evaluating the spatial management plan	
	Approving the spatial management plan	
8. Implementing and enforcing the spatial management plan	Implementing the spatial management plan	Clear identification of actions required to implement, ensure compliance with, and enforce the spatial management plan
	Ensuring compliance with the spatial management plan	
	Enforcing the spatial management plan	
9. Monitoring and evaluating performance	Developing the performance monitoring program: <i>Action 1: Re-confirming the objectives</i> <i>Action 2: Agreeing on outcomes to measure</i> <i>Action 3: Identifying key performance indicators to monitor</i> <i>Action 4: Determining baseline data on indicators</i> <i>Action 5: Selecting outcome targets</i>	A monitoring system designed to measure indicators of the performance of marine spatial management measures
	Evaluating performance monitoring data	Information on the performance of marine spatial management measures that will be used for evaluation
	Reporting results of performance evaluation	Periodic reports to decision makers, stakeholders, and the public about the performance of the marine spatial management plan
10. Adapting the marine spatial management process	Reconsidering and redesigning the marine spatial planning program	Proposals for adapting management goals, objectives, outcomes and strategies for the next round of planning
	Starting the next round of marine spatial planning	
	Identifying applied research needs	Identification of applied research needs.

10.2 Marine Management Organisation (United Kingdom)

Regarding the development and implementation of marine spatial plans, the Marine Management Organisation (MMO) of the UK provides a marine planning process illustrated in Figure 19. Details of their planning process is available at <https://www.gov.uk/guidance/marine-plans-development>.

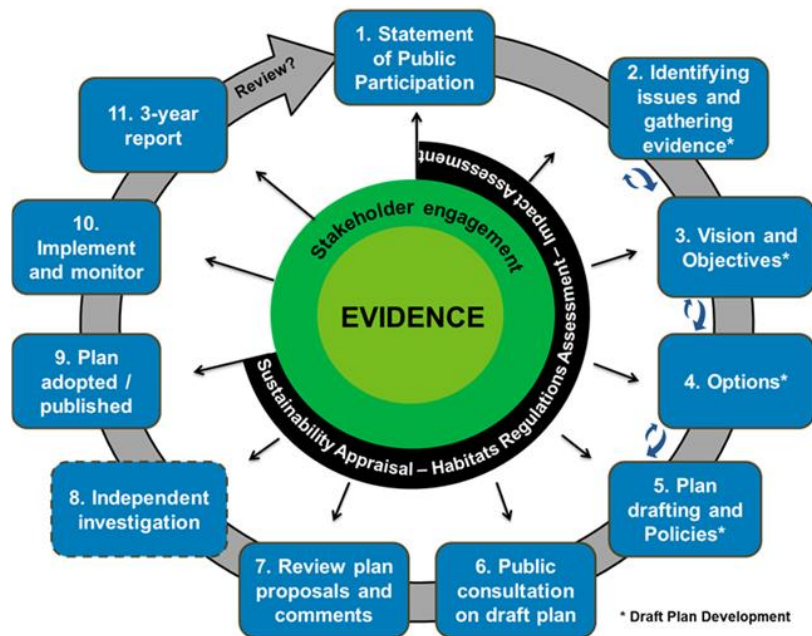


Figure 19. The marine planning process developed by the Marine Management Organisation of the UK.

Again, it is critical to note that these steps form part of a continuing process, with stakeholder engagement and an evidence base at the core. Conflict and competition for resources (e.g. marine space) amongst stakeholders is best managed with time (needed to build relationships with stakeholders) and sound evidence to validate claims made by both stakeholders and the authorities or institutions responsible for MSP.

10.3 An ecosystem-based regional MSP process for the Western Indian Ocean

Based on the previous two examples, other global best practice and TWG and stakeholder input into this strategy, the following steps are recommended for an ecosystem-based regional MSP process for the WIO (Figure 20). Evidence-based decision-making, meaningful stakeholder involvement and adaptive management are at the core of the process. A systems thinking approach is recommended to mainstream evidence-based recommendations into policy formulation and decision making, in-line with the systemic Theory of Change summarised in Figure 9 and the systemic perspectives on the strategic priorities in Figures 13-16.

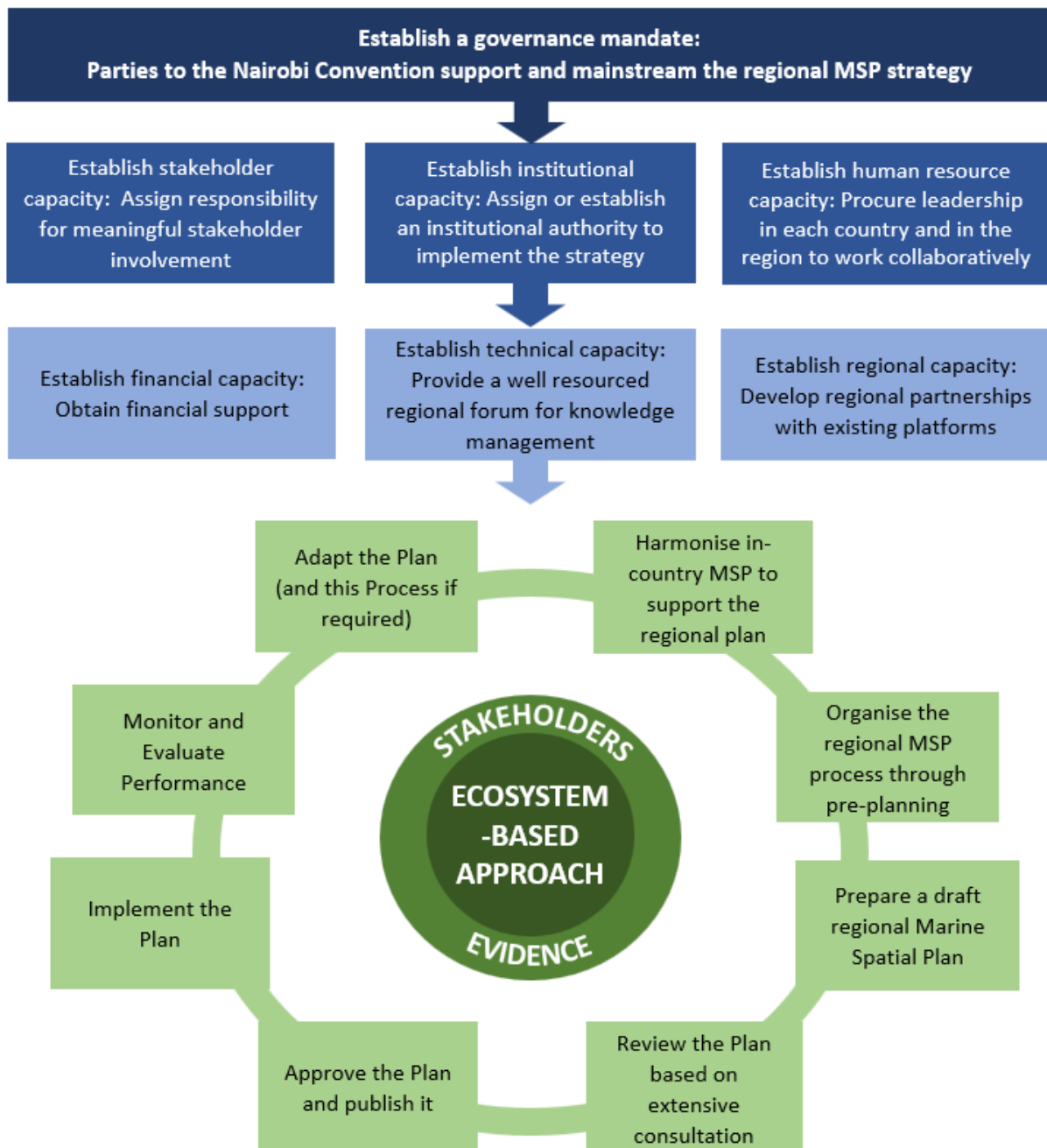


Figure 20. Recommended approach for a regional marine spatial planning process for the Western Indian Ocean. To enhance clarity, the necessary feedbacks and iterations are excluded from this graphic.

11 Recommendations

Recognising that countries of the WIO are at different stages and have different priorities with regards to MSP, both strategic and technical recommendations are provided as follows:

11.1 Strategic Recommendations (Actions for the parties to the Nairobi Convention)

Contracting parties are encouraged to:

- Support and mainstream this marine spatial planning strategy to achieve improved governance of the WIO.
- Harmonise in-country MSP development in support of regional marine ocean use and planning, without compromising national MSP processes.
- Adopt an ecosystems-based approach to MSP, according to the “Malawi Principles” and the IOI-UNESCO steps.
- Secure funding and develop capacity for regional and in-country MSP.
- Develop regional partnerships with regional economic communities (e.g., SADC), regional fisheries management organizations and other regional bodies and commissions (e.g. the IOC).

11.2 Technical Recommendations (Actions for the MSP Technical Working Group)

The technical working group is encouraged to:

- Provide a platform for shared learning and promote regional best practice.
- Promote an enabling policy environment for the development of in-country MSP legislation.
- Assist with establishing in-country cross-sectoral forums/committees/working groups to provide integration of sectoral policies and assist with the MSP process.
- Develop in-country knowledge management systems that contribute to, and benefit from, a regional knowledge management system.
- Develop a communication and stakeholder engagement plan to ensure co-development and support for regional and national area plans.
- Support capacity development within and between countries to support strategy implementation.

12 Appendix

12.1 Technical Working Group and Stakeholder responses to questionnaires

12.1.1 Governance challenges

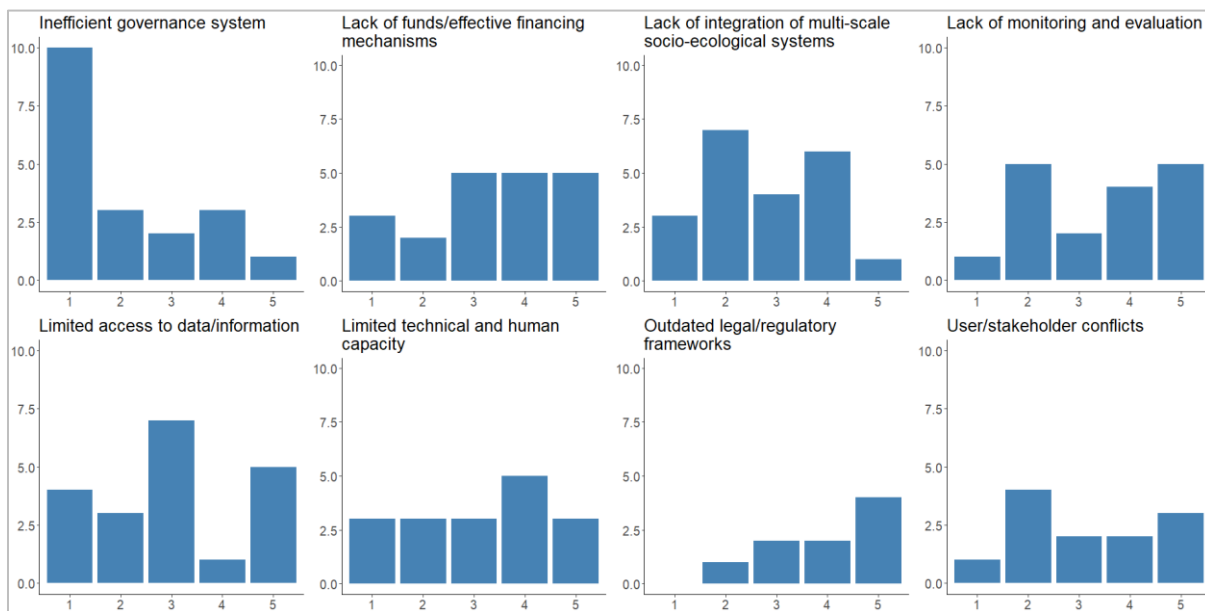


Figure A1. Frequency distribution of the survey responses for each governance challenge identified in the questionnaire.

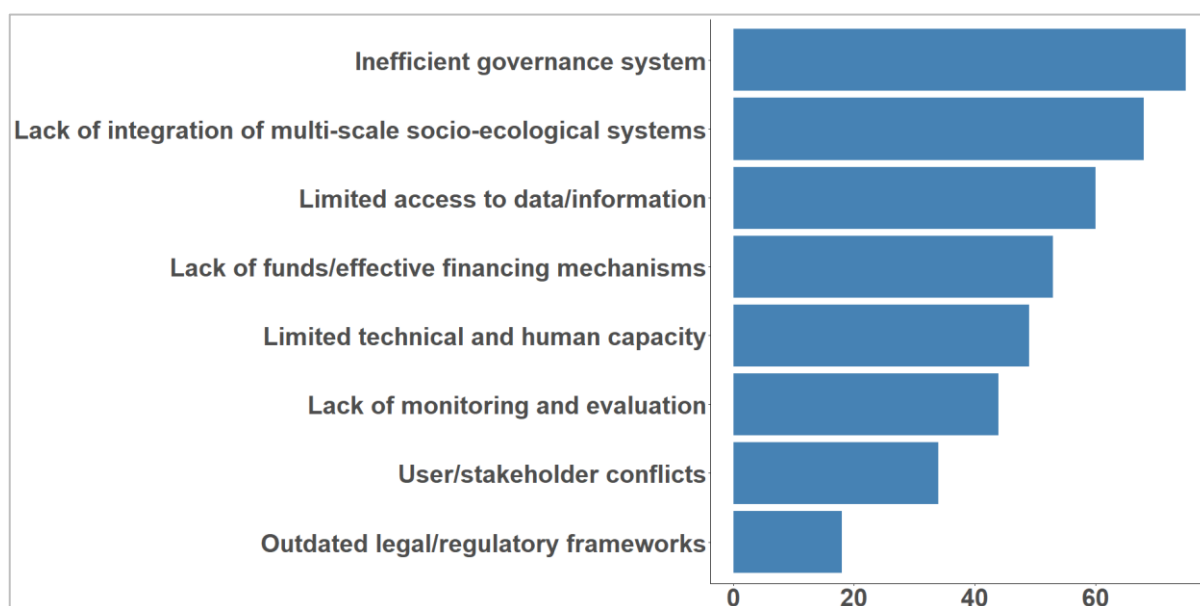


Figure A2. Weighted ranking (%) of survey responses for all governance challenges.

12.1.2 Threatening Processes

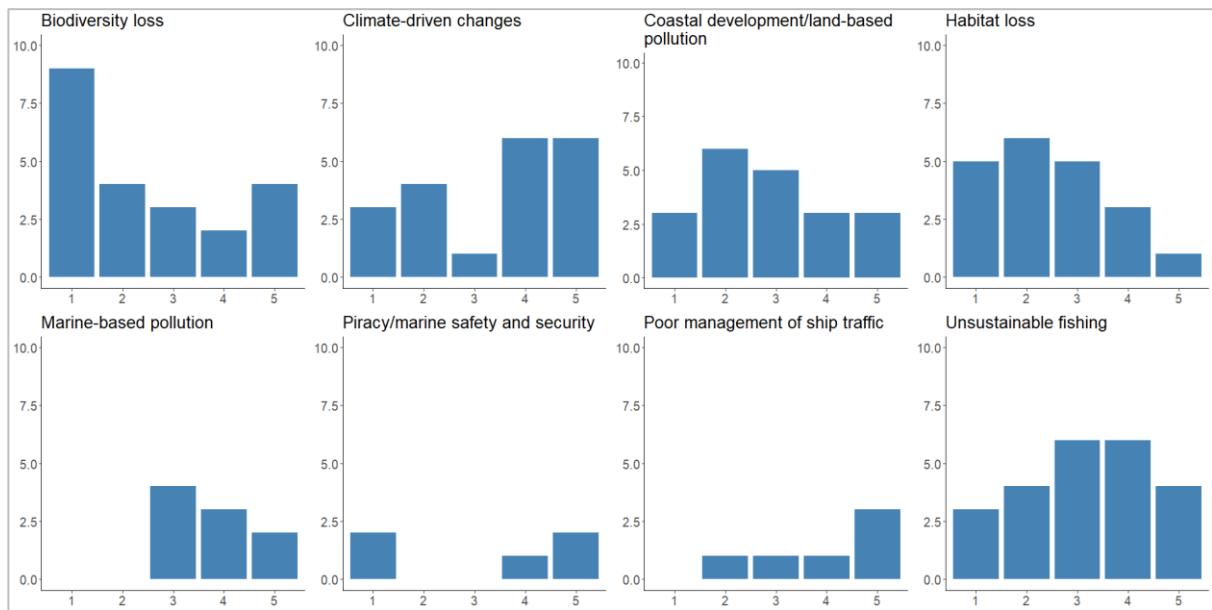


Figure A3. Frequency distribution of the survey responses for each threatening process identified in the questionnaire.

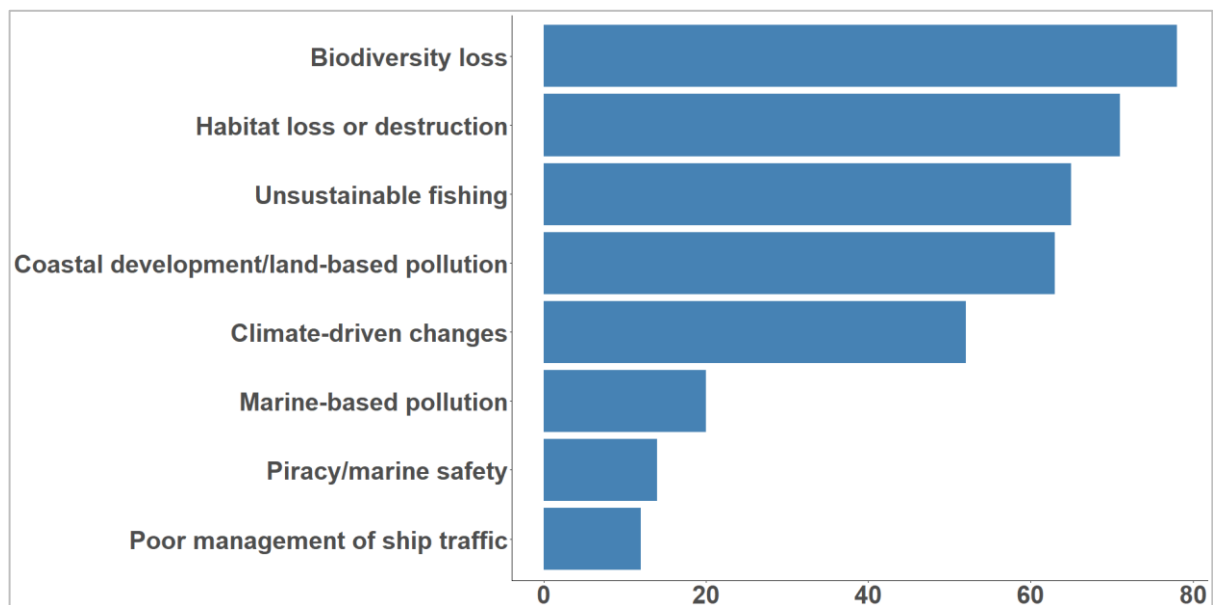


Figure A4. Weighted ranking (%) of survey responses for all threatening processes.

12.2 Vision



Figure A5. Results of questionnaire to TWG and other stakeholders regarding a vision for the strategy (word cloud).

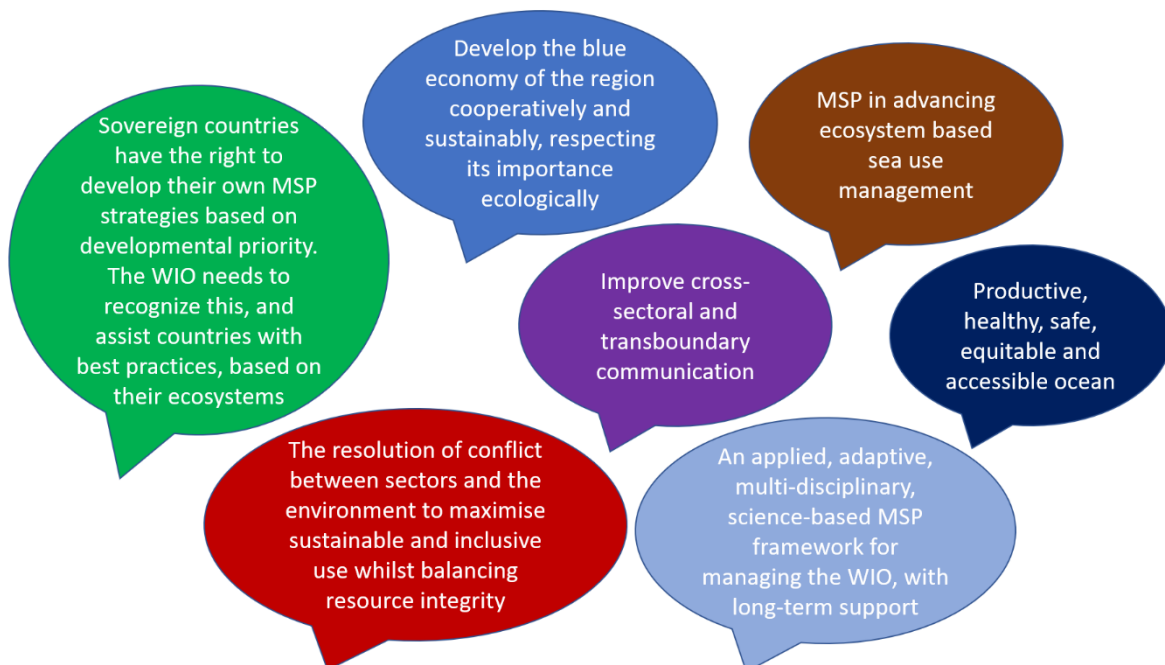


Figure A6. Results of questionnaire to TWG and other stakeholders regarding a vision for the strategy (summary of statements provided).

12.4 Objectives

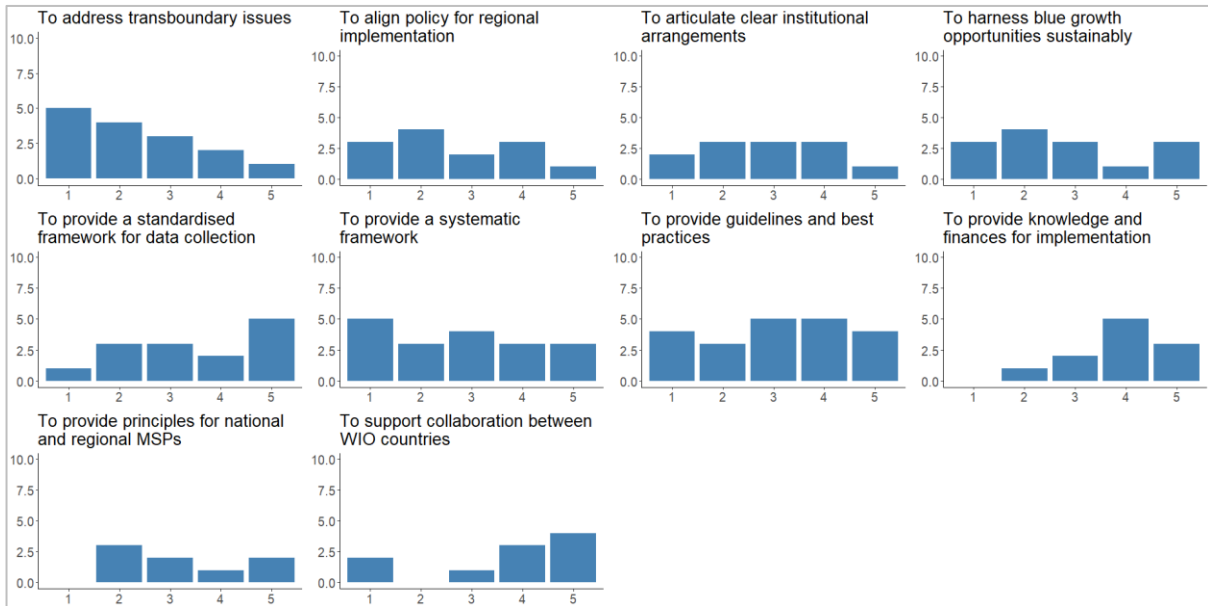


Figure A9. Frequency distribution of the survey responses for each objective identified in the questionnaire.

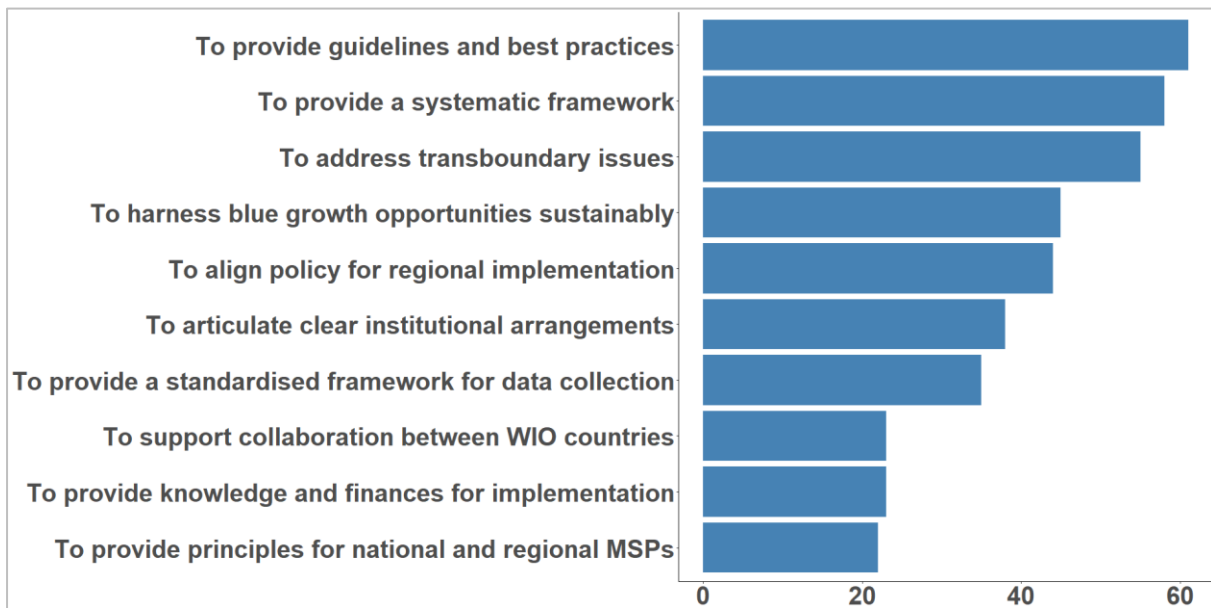


Figure A10. Weighted ranking (%) of survey responses for all objectives.

12.5 Strategic priorities

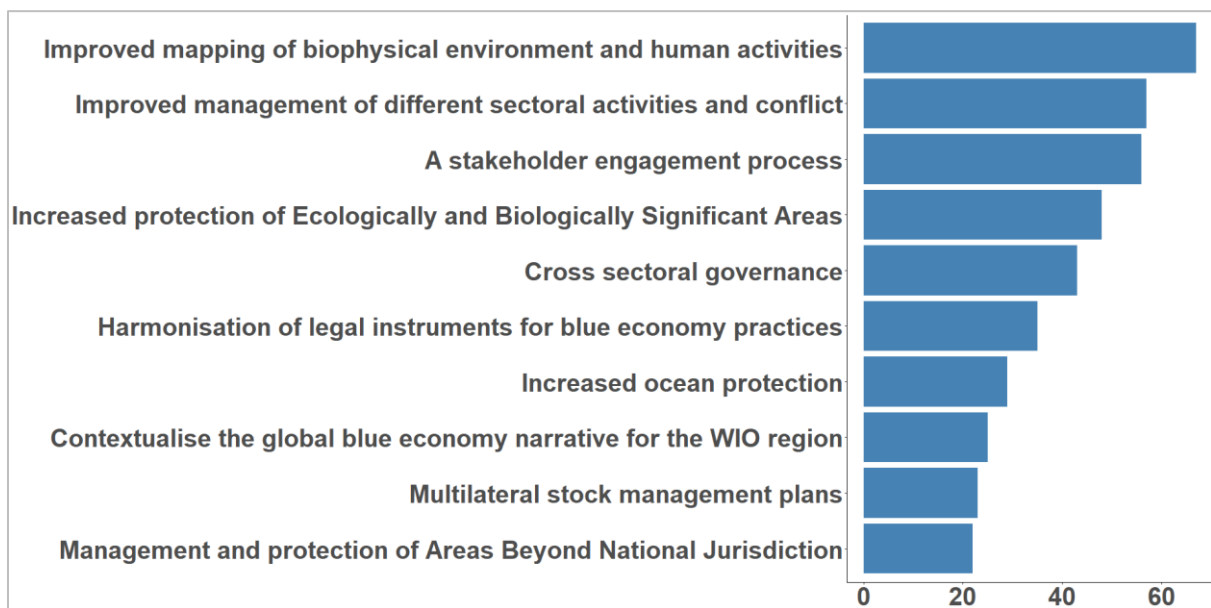


Figure A11. Weighted ranking (%) of survey responses for all strategic priorities identified in the questionnaire.

12.6 Implementation

12.6.1 Enabling mechanisms to implement the strategy

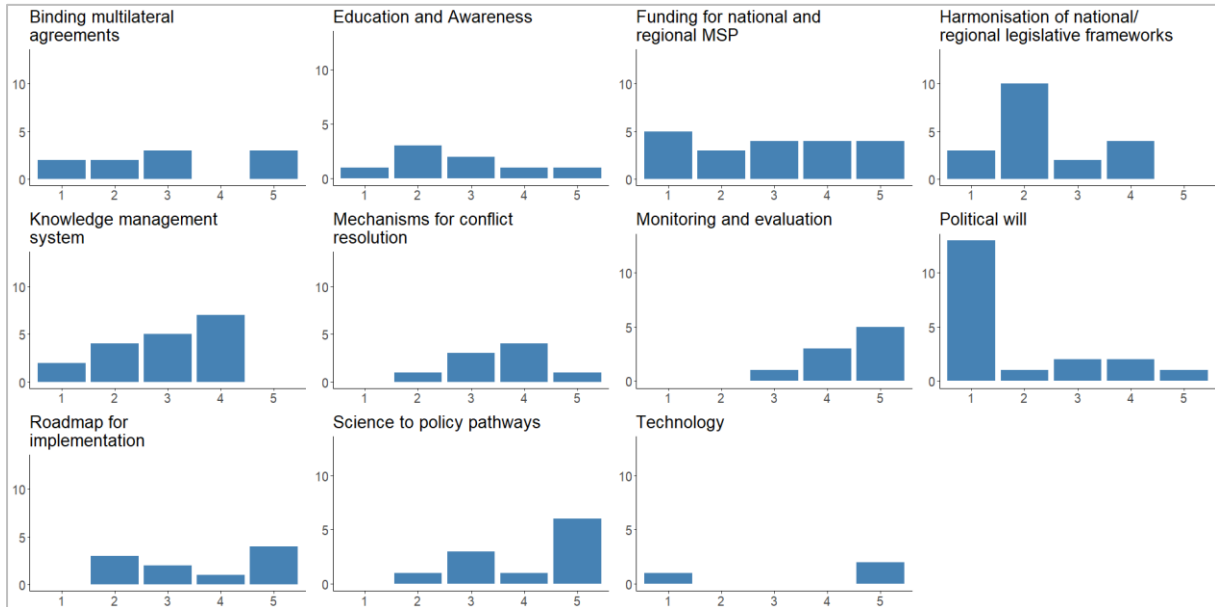


Figure A12. Frequency distribution of the survey responses for each enabling mechanisms identified in the questionnaire.

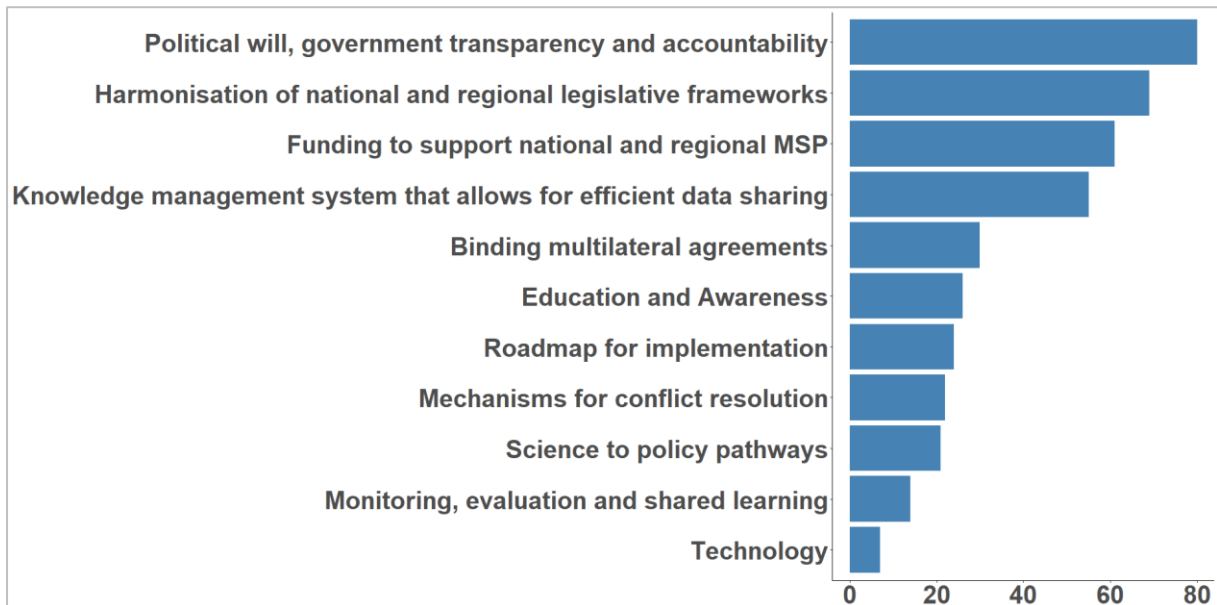


Figure A13. Weighted ranking (%) of survey responses for all enabling mechanisms.

12.7 Tools and resources for MSP

Table A1. A selection of online resources for MSP practitioners and researchers¹²⁰.

Description	Link
Capacity building on ocean research, all Intergovernmental Oceanographic Commission states	https://classroom.oceanteacher.org/
Center for Ocean Solutions, Stanford University, United States of America	https://oceansolutions.stanford.edu/
Coastal and Marine Spatial Planning tools, National Oceanic and Atmospheric Administration, United States of America	https://cmsp.noaa.gov/data-tools/tools.html
Coastal Resilience, Australia, Caribbean, Indonesia, North America, Mexico and Central America	http://coastalresilience.org
Collaborative Planning for our Oceans, Atlantic, Indian and Pacific Oceans	https://www.seasketch.org/
Community hub for Sustainable Ocean Management and Conservation, United States of America	https://www.openchannels.org/tools/field-tested-tools
Ecosystem-Based Management Tools, Global network of conservation and management practitioners (Institutions from Australia, France, Italy, United States of America among others)	http://www.natureserve.org/conservation-tools/ecosystem-based-management-tools-network
Mapping Ocean Wealth, Australia, Atlantic Coast, USA, Caribbean, Gulf of California, Indonesia, Micronesia	https://oceanwealth.org/
Marine Geospatial Ecology Tools, Global	http://mgel.env.duke.edu/mget
Marine Integrated Planning, Baltic, Adriatic and Black Sea regions	http://www.plancoast.eu/
Marine Plan Partnership, British Columbia, Canada	http://mappocean.org/
Marine Planning Concierge organises existing technical approaches, information, and tools in a generalised spatial planning framework, Vancouver	http://msp.naturalcapitalproject.org/msp_concierge_master/

¹²⁰ Lombard, et al., 2019.

Island, Belize, Barbados, New England, The Bahamas, Mozambique, California, British Columbia, Canada	
MSPGlobal is a joint initiative by UNESCO's Intergovernmental Commission (IOC-UNESCO) and the European Commission's Directorate for Maritime Affairs and Fisheries (DG MARE) to develop new guidelines on Maritime Spatial Planning	www.mspglobal2030.org/msp-global
Marine Spatial Planning Programme, Africa, Arctic, Asia, Oceania, Europe, Middle East, The Americas	http://msp.ioc-unesco.org/about/msp-at-unesco/
Marine Spatial Planning, Seychelles, Indonesia, Caribbean, Pacific Islands	http://marineplanning.org/
Marine Spatial Platform, Baltic, Black and North Seas, North East Atlantic and Mediterranean Oceans	https://www.msp-platform.eu/ ; https://www.msp-platform.eu/practices/ocean-multi-use-action-plan
Open Communications for the Ocean, United States of America	https://www.octogroup.org/
Platform for knowledge exchange and generation and capacity building for sustainable management, Caribbean Sea, Pacific Islands, Atlantic and Indian Ocean	https://bluesolutions.info/
The Global Oceans Regime, Council in Foreign Relations, United States of America	https://www.cfr.org/report/global-oceans-regime
Tools for understanding marine biodiversity and assessing good Environmental Status, Gulf of Finland, Kattegat, Southern North Sea, Bay of Biscay, Adriatic Sea, Eastern Aegean Sea, Sea of Marmara, and Western open Black Sea	http://www.devotes-project.eu/
United Nations Environment Programme, Global	https://www.unenvironment.org (search for "Marine Spatial Planning"); http://wedocs.unep.org/handle/20.500.11822/22186 ; https://www.unenvironment.org/nairobiconvention/nairobiconvention