Marine protected areas

Addressing shifting governance contexts and development objectives in the Quirimbas National Park, Mozambique

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Summary

This paper presents critical lessons from the Quirimbas National Park (QNP) review process and policy recommendations for implementing spatial management efforts in the Western Indian Ocean (WIO). This case study provides insights into how Mozambique's development trajectories have influenced governance of the QNP, and consequently, the proposed downgrading of regulations and expansion of protected area boundaries. Shifting the most populated areas to sustainable use management will relax park regulations and allow the government to accommodate and engage local communities in various sustainable use activities. This will also enable the creation of additional sources of income for the conservation area and contribute to its financial sustainability. Whereas keeping the ecologically essential areas under total protection management will help prevent future degradation of these areas. Lessons learned from terrestrial parks that went through downgrading, downsizing, and degazettement (PADDD) show the importance of increasing the governance capacity of various government levels and stakeholders involved in protected area management.

Background and rationale

Marine protected areas (MPAs) are among the most commonly applied spatial management tools for biodiversity conservation. Considering their history, MPA planning and management have evolved to address multiple objectives and evaluate different approaches to ensure their success and sustainability (Hough 1988; McCook and others, 2009; Pressey and Bottrill 2009). In terms of planning, MPA objectives have included ecological processes and various threats to ensure persistence of biodiversity, and different social, economic, and political considerations to reduce conflict between protected area management and stakeholders, and increase compliance (Ban and Klein 2009; Green and others, 2009; Pressey and Bottrill 2009). Management has also evolved to become more adaptive to increase MPA effectiveness (Hockings and others, 2000; Salafsky and others, 2001). Despite the considerable strides, MPA planning and management have yet to learn to be more dynamic to keep up with shifting governance contexts and development objectives to ensure their success and sustainability (Pressey and others, 2013).

Currently, there are 154 MPAs in the Western Indian Ocean (WIO), and these were established with different objectives and are managed using different approaches (Levin and others, 2018). In addition to government-led MPAs, Kenya, Tanzania, Mozambique, and Madagascar have locally-managed marine areas (LMMAs) established by communities with support from various bridging organisations (Rocliffe and others, 2014). Whilst the WIO have come closer to achieving biodiversity targets set by various international agreements. East African nations still struggle to maintain the effort needed to implement their MPAs effectively (Gill and others, 2017; McClanahan and Muthiga 2017; Levin and others, 2018). The majority of the MPAs and LMMAs in the WIO have limited management performance due to

changes in governance structure, insufficient finances, weak enforcement, and lack of human resources and technical capacity (Rocliffe and others, 2014; Gill and others, 2017). Hence, it is important to understand the history and limitations of existing management approaches and the shifts in governance priorities to make meaningful recommendations to adapt to the changing MPA contexts.

Using the Quirimbas National Park (QNP) in Mozambique as a case study, we describe the lessons learned from the protected area review process. The lessons presented in this paper are envisioned to provide insights into how the development trajectories of Mozambique have influenced governance of the QNP, and consequently, the proposed downgrading of regulations and expansion of protected area boundaries.

Expansion of the Quirimbas National Park

The QNP is located in Cabo Delgado province in Northern Mozambique. It has a total area of 9 130 km², including 7 945 km² of terrestrial and 1 185 km² of marine components (Figure 1A). It is also surrounded by a buffer area that has a total area of 5 730 km². The QNP was established in 2002 by the national government with support from the World Wide Fund for Nature (WWF-Mozambique) and other stakeholders (Mozambique government - Ministry of Tourism 2004; Baghai and others, 2018). Unlike most of the protected areas in Africa, one of the main reasons for the QNP's establishment was to conserve biodiversity and support rural development for local communities in Cabo Delgado (Chevallier 2018; Mucova and others, 2018). More specifically, the QNP was also established to support the needs of communities residing in the park, which included: i) addressing human and wildlife conflict; ii) supporting the economic and infrastructure development within the park and Cabo Delgado; and iii) diversifying livelihood opportunities to benefit communities (Mozambique government - Ministry of Tourism 2004; Baghai and others, 2018).

Since its establishment, the QNP has gone through two different management models (Baghai and others, 2018), shifting from technical-financial support partnership to government management model. From 2005 to 2010, the park was managed under a partnership between the government and WWF-Mozambique with funds from the French Agency for Development (AFD), where the government remained the official authority for the park and WWF-Mozambique played an active role providing

technical and financial support to build management capacity (Baghai and others, 2018). From 2011 to 2016, the WWF-Mozambique started phasing out the partnership, shifting to an advisory support role. The view of the donors and WWF was that their role as partners should be short-term, and the Mozambican government should start taking on the leadership role to increase their management capacity. Since 2017, when the partnership ended, the park has been under the government management model, while WWF remained engaged in some community projects but no longer directly involved in park management (Baghai and others, 2018). Since the shift in governance structure, management of the QNP has weakened, and recent assessments have shown declines in forest vegetation, wildlife populations, and coral reef condition inside the park due to various human activities and encroachment of mining operations (McClanahan and Muthiga 2017; Baghai and others, 2018; Mucova and others, 2018).

With the enactment of the Conservation Law in 2017 and its corresponding regulation in 2018, the government started reviewing conservation areas' status, objectives, and governance and their alignment with the new management categories defined by the law. The review of the QNP was undertaken between 2019 and 2020 and engaged various stakeholders from the QNP management, government officials and staff from Cabo Delgado, and representatives from other institutions that have been involved in planning and management of the park in multiple stakeholder workshops. Initially, the review's focus was to identify, under the new conservation law. This management category could allow better management of protected areas, and for the case of the QNP, with an increasing resident population highly dependent on natural resources for livelihood. The objectives of the review then shifted to re-thinking and redesigning the protected area management zones and restrictions.

The stakeholder engagement process adopted a top-down approach, where spatial design scenarios were prepared using biodiversity conservation and socioeconomic objectives. These design scenarios were then presented to stakeholders for review and discussion. During the participatory review process, stakeholders suggested expanding the QNP to extend regulatory and management frameworks for unmanaged areas of Cabo Delgado with high importance for conservation. However, the high level of restrictions in national parks (ie, total protection areas) would not

LEGEND

Quirimbas National Park

Current extent & zones
- ▮ (red) LMMAs
- ▮ (black) Marine - Total protection
- ▮ (teal) Terrestrial area of the park
- ▨ Buffer

Proposed major zones
- ▮ (teal) National Park
- ▦ Environmental Protection Area

Benthic habitats & features
- ▮ (pink) Corals
- ▮ (green) Seagrass/ algal beds
- ▮ (tan) Sand
- ▮ (blue) Open Water
- ▮ (brown) Turbid Water
- ▮ (light green) Shelf
- ▮ (light blue) Slope
- ▮ (pale) Abyss

Economic activities
- ▮ (dark gray) Active mining concessions
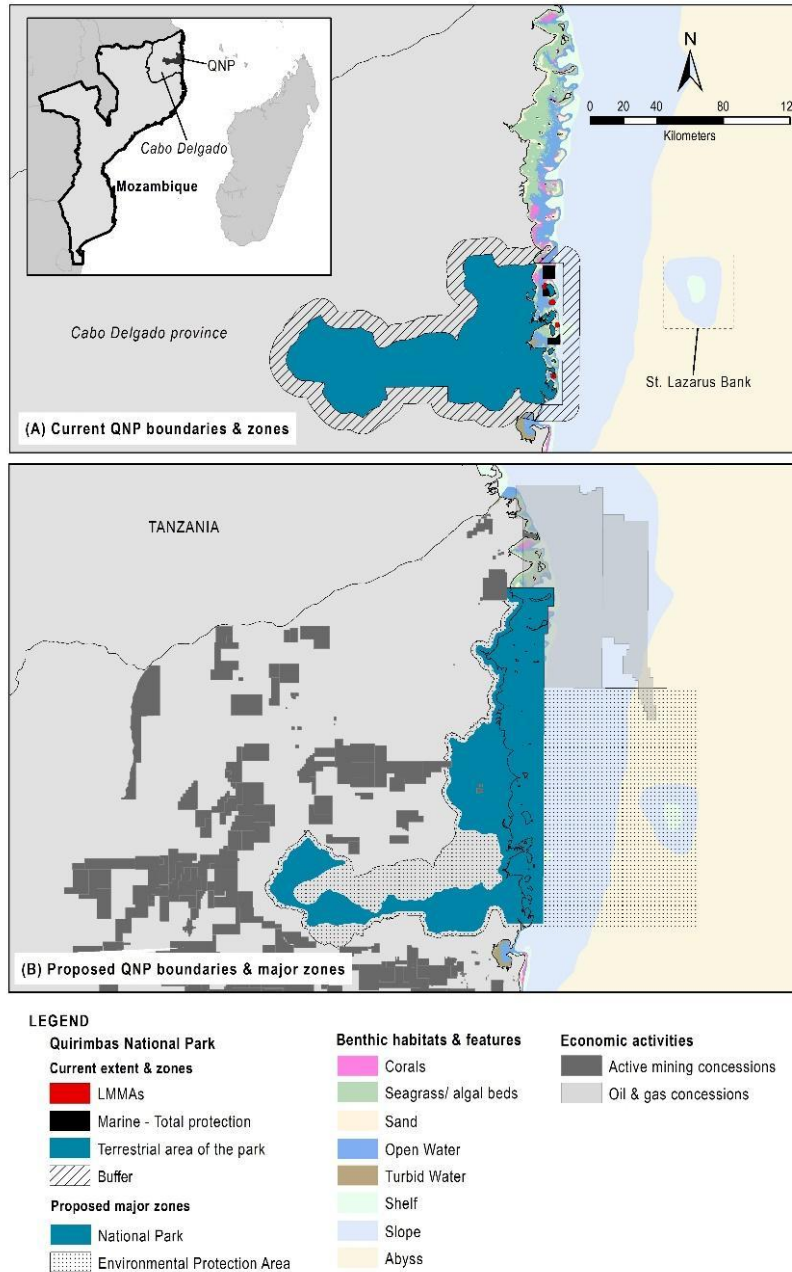- ▮ (light gray) Oil & gas concessions

Figure 1. Current (A) and proposed (B) QNP boundaries and major zone categories. Note that the terrestrial zones in the current zoning scheme are not presented.

allow resident communities to use natural resources in the area, increasing conflicts related to access to natural resources and exacerbating poverty in the region. Because the conservation law defines new conservation area categories, it was concluded that the most populated areas of the QNP should be downgraded to the category of Environmental Protection Area (EPA) (ie, sustainable use conservation area) to allow sustainable use activities and promotion of the inclusive conservation approach, where local communities can effectively contribute to the conservation of biodiversity and benefit from it.

The EPA is also the only conservation area category that allows creating other conservation areas inside its boundaries. Therefore, zoning can be done in two ways: (1) considering the zoning categories defined by the law, and (2) for areas inside the EPA that would need dedicated management or a higher level of protection, it could be considered the creation of other conservation areas inside the EPA. Thus, to provide a higher protection status to areas with high value for conservation (ie habitats and ecosystems relevant for conserving biodiversity), stakeholders opted to keep some areas categorised as national parks inside the EPA. If ratified,

this will increase the total area managed in Cabo Delgado and ensure sustainable use of ecosystem goods and services in the province (Figure 1B).

The proposed EPA has a total area of 27 520 km², which could potentially conserve and manage 10 022 km² of terrestrial and 17 497 km² marine ecosystems and habitats (Figure 1B). Whereas the proposed national park area (QNP inside the EPA area) could potentially protect an area of 9 827 Km², of which about 4 262 Km² is marine. The proposed expansion's two major zones (ie, QNP and EPA zones) will be zoned further based on different objectives. For the marine component, the QNP and EPA are envisioned to protect coastal and marine ecosystems, including the northern islands up to Vamizi Island, about 700 Km² of mangrove forest, and the offshore area of St. Lazarus Bank (about 100 km from the coast).

Lessons learned from the QNP expansion

The proposed expansion of the QNP was also a result of efforts by the Mozambican government to update the category of several conservation areas in the country to align the status of these areas to the terms of the new conservation law and improve management of these conservation areas. Shifting the most populated areas to sustainable use management will relax park regulations and allow the government to accommodate and engage local communities in various sustainable use and economic activities within EPA boundaries. This will also enable the creation of additional sources of income to the conservation area and contribute to its financial sustainability. Keeping the ecologically important areas under total protection management as a national park will help prevent future degradation of these areas.

The shift from total protection to sustainable use management of the most populated areas of the QNP is a form of protected area downgrading, downsizing, and degazettement (PADDD). The potential increase of the total area conserved occurred in the backdrop of human encroachment settlements and other activities inside the strict protection zones of the QNP. Although the increase in the total area of protection may be seen as a win for biodiversity conservation, establishing and managing it might become more challenging. Protecting such a large area will require appropriately crafted policies to support park regulations, strict enforcement of management zones, and high governance capacity. Moreover, managing a much larger size would require more human and financial resources,

which the government have already found challenging to provide. Therefore sources for financing the conservation area must be identified and promoted. Lastly, downgrading the entire scope of the QNP to a sustainable use area could still potentially negatively impact the conservation area management and contribute to changes in park boundaries and regulations. Studies have shown that the probability of an enacted PADDD event increases with the protected area's size (total area). This is likely to occur with increasing local population densities and economic growth (Symes and others, 2016). Thus, the increase in the total area could put it at higher risk of being amended again in the future. Still, the review in zoning may help define strategies to manage the growing population and promote improved inclusion of these communities in conservation initiatives.

Although there are a lot of potential negative implications of downgrading part of the QNP to a sustainable use management area, communities and other stakeholders in Cabo Delgado have been greatly encouraged by the review process. The review process also facilitated several different discussions about including participatory processes in decision-making and management to sustain the QNP. The renewed interest and commitment of various stakeholders in the QNP will hopefully contribute to improved governance of this area.

Policy recommendations for implementing spatial management efforts in the WIO

Frequently, MPAs are considered permanent spatial closures. However, governments worldwide enact PADDD when human activities encroach protected area boundaries or when development is prioritised over conservation objectives. PADDD is not unique to Mozambique, and it has been recorded globally, including some of the WIO countries. Some of the terrestrial protected areas in Kenya, Madagascar, Tanzania and South Africa were downgraded, downsized, or degazetted because of encroachment of pastoralist communities, land titling, logging concessions, timber licensing, and government corruption (Mascia and Pailler 2011).

Lessons from these terrestrial parks point out the importance of increasing the governance capacity of various government levels and stakeholders involved in protected area management. This also holds for MPAs and other spatial management tools that can be

used to regulate coastal and marine areas in the WIO. Increasing the governance capacity of WIO nations is very important because it can ensure that MPA and other management zones and relevant laws and regulations are strictly enforced and that sufficient resources are allocated. Increasing the governance capacity of relevant stakeholders will require improving their awareness and education of the importance of maintaining ecosystem function to sustain the benefits provided by various coastal and marine ecosystems. Hopefully, this will help government and non-government stakeholders explicitly discuss trade-offs between conservation and development objectives to make informed and better decisions.

From this experience, we recommend that the WIO states consider the following recommendations to limit PADDD in both MPA and terrestrial protected areas:

Technical recommendations
- Ensure management effectiveness assessments are included in MPA management plans and are conducted regularly as part of the adaptive management cycle;
- Support and develop research on PADDD to understand its implications on the achievement of conservation, social, and economic objectives.

Policy recommendations
- Promote a more inclusive approach to MPA management by considering access, use rights, and cultural and historical values of local communities to reduce PADDD;
- Identify complementary financing sources (eg, sustainable tourism, nature-based solutions, biodiversity offsets) and encourage broader stakeholder engagement to sustain MPA management; and,
- Formulate criteria and guidelines as part of the regional MSP implementation process to accommodate current and future transformations caused by social, economic, political and climate change events to minimise the negative impacts of PADDD.

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Strengthening the WIO MPA System (WIOMPAS): Institutionalising performance tracking and expansion of conservation areas through multi-level cooperation

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Summary

The advocacy for establishing a global network of marine protected areas (MPA) has led to the scaling up of local efforts and attempts to develop and strengthen national to regional initiatives. This support for MPA networks continues to rise due to the increasing number of studies on the ecological benefits that networks provide, including enhanced ecosystem recovery and fisheries sustainability. However, significant advances in MPA network development is urgently needed to address the continuous threats from fisheries exploitation, pollution from oil and gas concessions, shipping and land-based threats, and the impacts of climate change. Moreover, a larger proportion of the world's oceans are still unprotected, including the Western Indian Ocean (WIO). In July 2021, the United Nations Environment Programme (UNEP) Nairobi Convention and the Western Indian Ocean Marine Science Association (WIOMSA) launched the MPA Outlook. This report written by representatives from each of the Contracting Parties to the Nairobi Convention is the first review of MPAs in the WIO. The Outlook report presented and described the Contracting Parties' progress in achieving Aichi Target 11 and Sustainable Development Goal 14 set by the Convention of Biological Diversity (CBD) and the U.N., respectively. Considerable effort has been undertaken by the governments, non-government and academic institutions, and communities to establish and manage the 143 MPAs and 173 locally-managed marine areas in the WIO. These national and local MPA efforts had led to the protection of 7 per cent of the combined exclusive economic zone in the region. Whilst the WIO countries have made great strides in marine conservation in the last decade, there is still a lot to be done to expand protection and improve the management effectiveness of existing MPAs. Additionally, an assessment of how existing MPAs can contribute to the achievement of other Aichi Targets (eg Target 6 – fish, invertebrates and aquatic plants are managed and harvested sustainably) is also needed to ensure that management initiatives in the region can support broader conservation and sustainability goals. These assessments could also identify data and information gaps to help monitor and evaluate MPAs and coastal and resource governance assessments. Furthermore, a strategic roadmap is needed to help WIO governments prepare to implement the post-2020 biodiversity policy. To contribute to these initiatives, a systematic framework to strengthen the WIO MPA System (WIOMPAS) is recommended to institutionalise the performance tracking of individual MPAs and expedite the expansion of existing conservation efforts. The Contracting Parties to the UNEP Nairobi Convention can facilitate top-down and bottom-up governance schemes in-country and bilateral cooperation between neighbouring countries to implement the systematic framework to be developed. The WIOMPAS framework will serve as the basis for developing MPA networks at the country-level, including a system of MPAs through national- and community-led initiatives and transboundary arrangements. Moreover, the role of other effective conservation measures (OECMs) in the WIO and their social, economic, ecological and legal context and general guidelines for their implementation will be articulated. The framework will also serve as a guide to support the institutionalisation of MPA monitoring and evaluation to improve management efforts and ensure the sustainability of conservation efforts. It is also important that this framework be prioritised and integrated within broader regional and national marine spatial and land-sea planning initiatives to help increase the effectiveness of MPAs by minimising threats from land-based, coastal and maritime activities.

Background and rationale

Establishing a global network of MPAs is key to sustaining marine biodiversity and fisheries and to ensuring the persistence of biodiversity in the face of climate change (IUCN-WCPA, 2008; Klein and others, 2015; Walton and others, 2014). As part of the global commitments to meet biodiversity targets, governments are scaling up their conservation efforts to establish MPA networks at the national level. Consequently, research on ecological and social processes that occur at multiple spatial scales are undertaken by different organisations and institutions to support the establishment and implementation of MPA networks at various spatial scales (Harrison and others, 2012; Horigue and others, 2012; Kool and others, 2011; Levin and others, 2018). Currently, research and development on MPA networks are primarily undertaken at local to sub-national scales (ie lower government levels or finer scale ecological units, such as bays, gulfs) due to the limitations placed by government jurisdictions and pragmatic management and policy concerns (Abesamis and others, 2017; Harrison and others, 2012; Horigue and others, 2012). Creating more localised MPA networks is a good first step, but it is necessary to step up efforts at national, regional, and even global levels to increase the protection of shared resources and coastal areas, resolve boundary disputes, and improve conservation efficiency by considering both land-based and maritime activities (Chua 2006; Horigue and others, 2012; Levin and others, 2018; Maina and others, 2020; Walton and others, 2014). A regional MPA network design can also be used as a framework to facilitate the establishment of national MPA networks that can incorporate different MPA types and management arrangements and strategies (Levin and others, 2018; Maina and others, 2020; Walton and others, 2014). The establishment of regional MPA networks could also facilitate the use and implementation of other spatial management tools to improve the management of shared seas and oceans and provide better safeguards to the increasing threat of climate change (Levin and others, 2018).

Scientific advances

Recent developments in conservation science show that increased protection of ecological processes in MPA designs (ie size, spacing, and location) can ensure the persistence of biodiversity and support fisheries sustainability (Bode and others, 2016; Green and others, 2015; Krueck and others, 2017; Magris and others, 2014). However, adequate representation of ecological processes within MPAs can be challenging because these processes often span larger (ie >1000s of kilometres) and multiple spatial scales (ie local to global) that may also transcend national boundaries (Cumming and others, 2006; Mills and others, 2010; Fidelman and others, 2012). To address these challenges, government cooperation, collaboration, and coordination is recommended to establish MPA networks that can transcend jurisdictions and be nested within the different levels of the government organisation (ie local government, national government, regional associations) (Chua, 2006; Horigue and others, 2012; Levin and others, 2018).

Table 1. Summary of COP Decisions that can be considered in the development of the WIOMPAS

COP and Decision Number	Focus	Relevance to the WIOMPAS
CP7/4 (1): recognition or designation of important bird areas	Important bird areas	Prioritise and ensure protection in national MPA networks
CP7/7: identification and description of ecologically or biologically significant marine areas (EBSAs)	Ecologically or biologically significant marine areas	Prioritise and protect national MPA networks
CP8/6 1 (a) & CP9/7(a): establishment of a transboundary MPA between Kenya and the United Republic of Tanzania	Transboundary MPAs	Conservation of marine corridors and transboundary areas Institutional arrangements for transboundary governance
CP8/6 2 & CP.9/7 (2): develop and implement new transboundary initiatives for management of shared resources	Transboundary management	Sustainable management of shared resources Institutional arrangements for transboundary governance
CP8/10 (4), CP8/13, & CP 9/10: developing area-based management tools such as marine spatial planning	Area-based management	Application of spatial planning tools and management
CP9/10 (4): establishment of MPAs in areas beyond national jurisdiction	Areas beyond national jurisdiction	Protection and sustainable management of shared resources Institutional arrangements for collaborative governance

Establishing MPA networks require significant resources, technical expertise, and social capital among different stakeholders, especially government institutions (Fernandes and others, 2009; IUCN-WCPA 2008; Weeks and others, 2014). Therefore, scaling up to form a regional MPA network would require countries to formulate concrete plans to develop national MPA networks (Horigue and others, 2012; Walton and others, 2014). Moreover, national governments should coordinate with neighbouring states to create synergies, address boundary disputes, and align development priorities with increasing the regional network's effectiveness (UNEP-WCMC 2008; Walton and others, 2014).

Regional governance context

The WIO is in a position to establish a regional MPA network because the UNEP Nairobi Convention provides the institutional arrangements that can help facilitate and guide the development of national networks and coordinate efforts to strengthen regional

initiatives. Moreover, the governments of the WIO region have made many decisions that are relevant to regional MPA network establishment (Table 1).

These decisions motivate establishing different MPAs that address multiple objectives and require other governance arrangements without creating an MPA network. Moreover, these decisions may serve as an impetus for establishing different MPA types in the WIO. Still, a systematic approach for developing a regional MPA network will facilitate regional coordination and assist in organising initiatives to support decisions on identifying marine EBSAs, establishing transboundary MPAs, and implementing spatial management initiatives through marine spatial planning.

Additionally, a regional MPA Network for the WIO was recommended in the MPA Outlook to help expedite the expansion of marine conservation areas and coordinate efforts and share knowledge and resources to improve the management effectiveness of existing
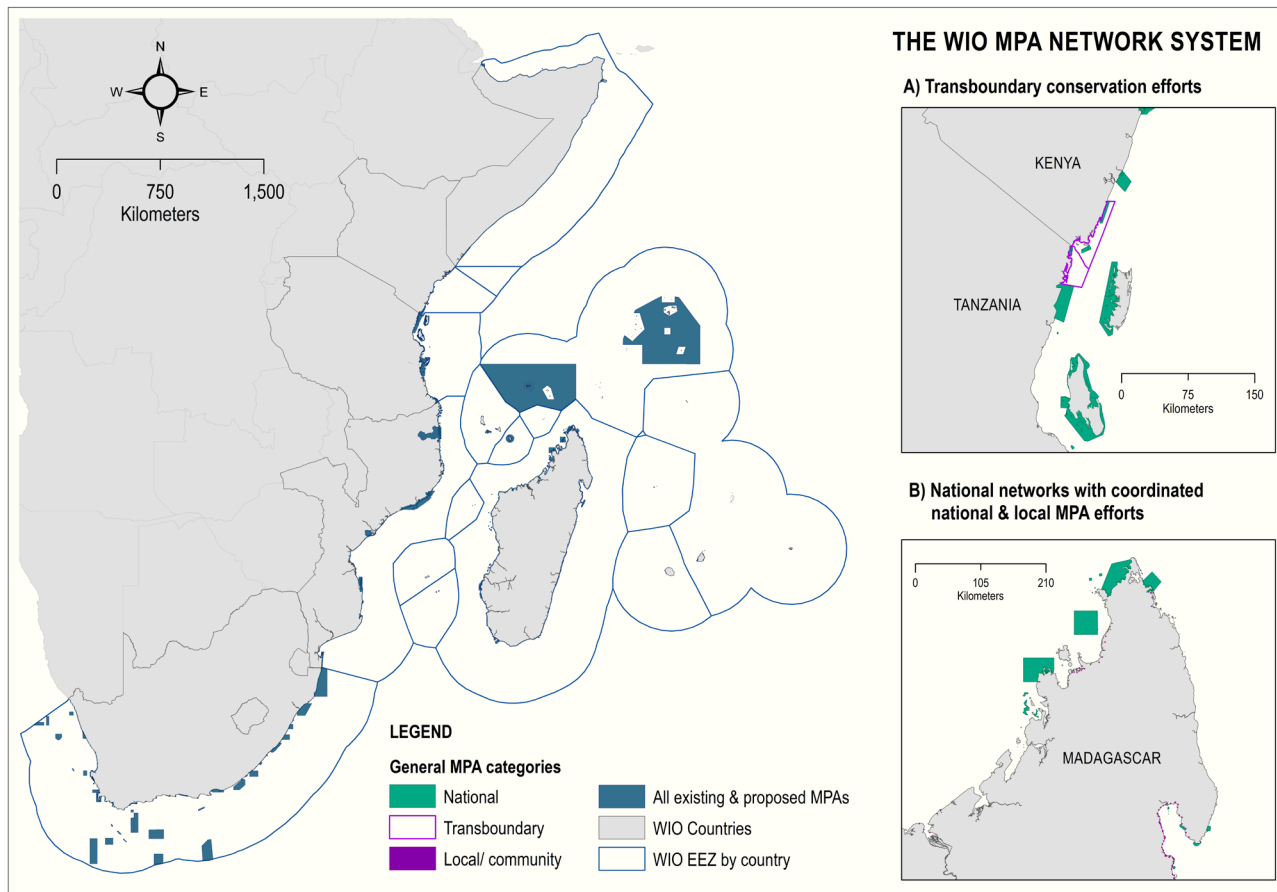
Figure 1. Existing and proposed MPAs in the WIO. The insets present (A) transboundary conservation, and (B) coordination of national and local MPA efforts that could be included in national MPA network plans. This multi-level and multi-scalar planning and governance approach will helpfully establish and strengthen the WIO MPA network. Note: MPAs presented in this figure does not include the Prince Edward Island MPA in South Africa, which was also excluded in Part V of the Outlook Report. Data sources: UNEP Nairobi Convention and WIOMSA. WIO MPA Database from the MPA Outlook Report

MPAs (Richmond and others, 2021). The MPA Outlook was initiated by the UNEP Nairobi Convention in partnership with the WIO Marine Science Association (WIOMSA) to review the progress made towards the achievement of the CBD Aichi Target 11 and United Nations Sustainable Development Goals (ie SDG 14). The development of the MPA Outlook required working closely with representatives from the Contracting Parties to develop the WIO MPA database, and evaluate MPA management performance using the Management Effectiveness Tracking Tool (Hockings and others, 2000; Stolton and Dudley 2016; UNEP and WIOMSA 2021).

Launched in July 2021, the Outlook report recorded 143 established MPAs in the region, which covers a total area of 555 437km² or 7 per cent of the combined EEZ of the WIO nations (Figure 1) (Richmond and others, 2021). This demonstrates substantial progress for marine conservation made by the region over the last decade. The MPAs established are crucial to protecting endemic WIO species, including the WIO coelacanth (*Latimeria chalumnae*), fish eagle (*Haliaeetus vociferoides*), big-headed turtle (*Erymnochelys madagascariensis*), and Madagascar teal (*Anas bernieri*); endangered species such as dugongs, leatherback and hawksbill turtles; and key bird nesting sites. The majority of these MPAs were established nearshore and covered coral reefs, mangroves and seagrass habitats, which translates to the protection of 17 per cent of the combined East African coastline (Chadwick and others, 2021; Richmond and others, 2021).

Despite the progress made towards achieving the Aichi Target 11, most offshore features (eg banks, seamounts) within the EEZ of WIO nations remain unprotected (Chadwick and others, 2021; Richmond and others, 2021). Furthermore, recent studies have found that MPAs are not connected, with significant gaps in connectivity conservation as envisaged in biodiversity conservation policies. Hence, more effort is required to protect these important habitats and processes. In addition to the area expansion, WIO governments need to exert more effort to improve the management performance of their existing MPAs (Chadwick and others, 2021; Richmond and others, 2021). An evaluation of 101 established MPAs showed that most MPAs were not effectively managed. Most of the MPAs assessed do not have sufficient financial, technical and human resource capacity and infrastructure to support operations. This lack of capacity have led to weak enforcement and continued illegal activities in

most MPAs in the region (Chadwick and others, 2021; Richmond and others, 2021).

The MPA Outlook development not only showed progress towards achieving international targets. It also described the strengths of WIO governments in MPA establishment and management and the opportunities for improvement. This includes having strong legal bases for establishing and managing MPAs, and institutional support through regional cooperation and other governance arrangements across different WIO governments and academic and non-government institutions (Tuda and others, 2019, 2021; Richmond and others, 2021). The WIO states are already sharing experiences through various regional fora organised by the UNEP Nairobi Convention Secretariat and WIOMSA. The governments could still enhance their efforts further by aiming to establish a regional MPA network (Richmond and others, 2021). The regional MPA network in the WIO can include transboundary arrangements between governments and national MPA networks (Figure 1A and B). Currently, the proposed marine transboundary conservation area between the shared border of Kenya and Tanzania is being championed as the model for co-developing shared MPAs (KWS and MPRU 2015; Tuda and others, 2019). In terms of developing national MPA networks, Madagascar has organised a network of locally-managed marine areas (LMMAs) through MIHARI in addition to its government efforts (Mayol 2013). This is an important development, particularly since LMMAs can be considered as OECMs and contribute to achieving biodiversity goals. Since these OECMs involve communities and indigenous groups in management, they can be an effective and sustainable conservation measure because they tend to be more socially acceptable (Gurney and others, 2021; Mayol 2013; Rocliffe and others, 2014).

Regional and global outlook

To establish a regional MPA System in the WIO or the WIOMPAS, it is important to consider the feedback relationship between individual MPAs and MPA networks (Figure 2). A functional network depends on effectively and sustainably managed individual MPAs; however, individual MPAs can benefit from being part of functional networks since networks contribute to enhanced recovery and improved management due to synergistic effects across connected ecosystems and coordinated governance (Horigue and others, 2012; Horigue and others, 2014). More specifically, the ecological component of MPA
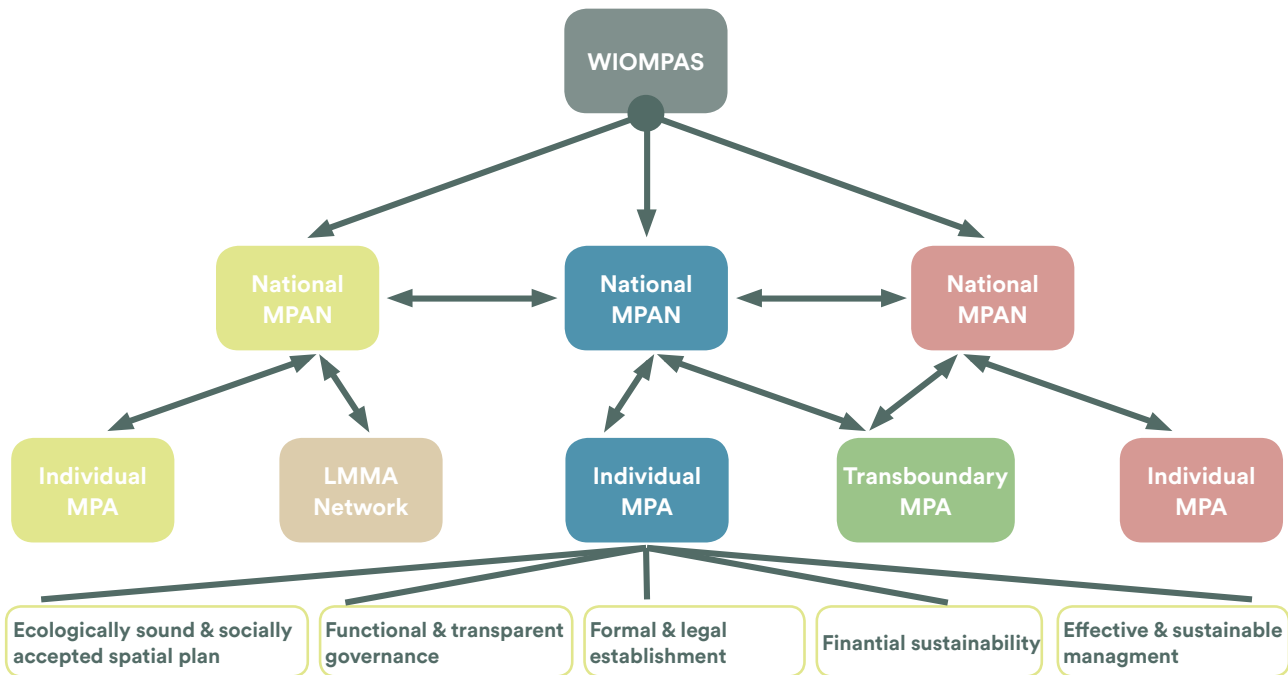
Figure 2. A systematic framework for strengthening and formally establishing the WIOMPAS through the coordinated establishment of national MPA networks that include different MPA types and governance arrangements.

networks is a system of individual MPAs that work synergistically to increase protection and ensure persistence of biodiversity inside and outside of MPAs (Abesamis and others, 2017; Grorud-Colvert and others, 2014). The social component of MPA networks helps increase the management effectiveness of individual MPAs due to the collaborative actions of individual MPA management and governance units (Lowry and others, 2009; Horigue and others, 2014). The ecological networks also depend on the effective and sustainable implementation of individual MPAs and coordination across different governance actors. The success and functionality of networks require an effectively designed system of individual MPAs implemented at various spatial scales and sustained implementation of individual MPAs (Lowry and others, 2009; Weeks and others, 2014; Horigue and others, 2015). The sustainability of individual MPAs relies on (1) functional and transparent governance; (2) formal and legal establishment; (3) availability of sufficient financial resources; and (4) continuous and adaptive management activities. (Horigue and others, 2012; Horigue and others, 2014). Hence, achieving sustainable management of the WIOMPAS will require concerted efforts from MPA managers, enforcers, governments, communities and other institutions to create networks at the national and sub-regional levels.

A systematic framework is necessary to strengthen the WIOMPAS. This framework will be used as the roadmap to describe the ecological and social components needed to develop and sustain national MPANs in the region (Figure 2). The ecological component of the WIOMPAS will include recommendations on the placement of MPAs that will be based on a systematic conservation planning process. Systematic conservation planning is a regional planning process that helps design efficient and socially acceptable conservation areas (Margules and Pressey 2000; Pressey and Bottrill 2009). It is adaptable to different contexts, including situations that have data limitations (Ban and others, 2009; Weeks and others, 2010). Using the systematic conservation planning process can also help ensure that the proposed design for the WIOMPAS adheres to ecological design principles and will be sensitive to the needs and other social and economic objectives in the region (Horigue and others, 2015; Weeks and others, 2015). The proposed MPAs in the network could include government-led conservation areas, OECMs, and transboundary conservation areas managed by the governments and communities.

The social component of the WIOMPAS, on the other hand, will form the institutional arrangements to support effective implementation and sustained

good governance of MPAs and national networks. Developing these institutional arrangements will require a series of government and stakeholder meetings and bilateral agreements to coordinate the establishment and management of different MPA types. Elements of the social MPAN already exist in the region. These include the network of MPA managers and conservation scholars, leaders, and advocates organised by WIOMSA and the structures set by the UNEP Nairobi Convention. The Contracting Parties and the network members are already organising themselves and supporting different MPA initiatives (Richmond and others, 2021). However, there is still a need for improving coordination and reporting mechanisms to support the development of national MPANs and the WIOMPAS.

The WIOMPAS roadmap will also include guidelines to institutionalise monitoring and evaluation and regular reporting of the status of individual MPAs. Using the MPA Outlook as a baseline, the Contracting Parties could regularly monitor management performance, MPA staff competency, and MPA outcomes to gauge the effectiveness of conservation efforts in the region. Regular monitoring and evaluation, and reporting are important because it helps complete the adaptive management cycle. Consistent monitoring and reporting can also document and share best practices, identify gaps in management and knowledge, and increase transparency and accountability in governance.

Lastly, the WIOMPAS must be integrated into broader planning and management frameworks such as integrated coastal zone management and marine spatial planning (MSP) to ensure that ecosystems that underpin human well-being are protected and reduce conflict with other coastal maritime activities. Creating the WIOMPAS aligns with the proposed WIO MSP Strategy developed by Nelson Mandela University with support from the UNEP Nairobi Convention (Lombard and others, 2021) (See CP 8/10(4) and CP 9/10). The proposed regional MSP Strategy suggests developing and integrating MPA networks at the national level within governments' MSP processes and spatial management plans. Embedding the WIOMPAS in MSP will aid in reducing the coastal and marine threats to MPAs. However, threats to coastal and marine ecosystems should be treated holistically and include the threats coming from land-based activities. Hence, the WIOMPAS must also be integrated with land-sea planning processes apart from integrated

coastal zone management plans to consider the impacts of land-based activities, particularly in the face of global climate change and rapid urbanisation.

To strengthen the WIOMPAS, the Contracting Parties of the Nairobi Convention may need to consider the following:

- Develop and adopt a systematic framework to strengthen and formally establish the regional MPA System in the WIO (WIOMPAS) and ensure that the regional network adheres to ecological principles of MPA design and is sensitive to the social, economic, and cultural values in the region.
- Evaluate and identify other potential conservation areas in the WIO, which can be managed through different management schemes (ie individual governments or co-management schemes with communities, non-government organisations, and transboundary arrangements).
- At the national level, spatial planning processes must prioritise conservation areas and integrate them in broader land-sea and marine spatial planning processes to minimise threats to MPAs and ensure the persistence of biodiversity that WIO communities depend on.
- Institutional arrangements will be developed and adopted to ensure effective management of individual MPAs in the region, including mechanisms to regularly conduct and report results of monitoring and evaluation of MPAs established, management performance and competency of MPA staff, and have MPA representation in MSP stakeholder processes.
- Support capacity building initiatives and regular fora to help develop the knowledge and skills of different MPA leaders and personnel and align activities with the MSP Technical Working Group.

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A regional Marine Spatial Planning strategy for the Western Indian Ocean

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Summary

The need for a regional marine spatial planning (MSP) strategy was emphasised by the Parties to the Nairobi Convention (NC) and partners at a meeting to discuss MSP in the Western Indian Ocean (WIO) held in Dar es Salaam in March 2019. Here, the NC Secretariat was requested to work with partners to develop a strategy. From June 2020 to March 2021, a stakeholder process was undertaken to develop the principles and components of this regional strategy. The intention was to inform regional MSP processes and provide a framework for member countries to use as they develop their national strategy. Stakeholders identified the following vision for the regional strategy: "A WIO with inclusive and sustainable management of ocean and coastal ecosystem services for human wellbeing." The goal was defined 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." Based on an ecosystem-based approach to MSP, 11 objectives, nine strategic priorities and ten enabling mechanisms for implementing a regional MSP process were defined. The strategy adds a new dimension to global MSP practices by adopting a systems thinking approach (similarly proposed by the United Nations in 2014 for green economy policymaking). The strategy provides five strategic and four technical recommendations for member countries to consider. The strategy will be presented to the Tenth Conference of Parties to the Nairobi Convention (COP10) in November 2021 for consideration as an appropriate guidance document for the region. A complete draft of the strategy and its Appendices will be available from the Nairobi Convention Secretariat thereafter.

Background and rationale

Three years ago, Obura and others (2017) estimated the annual "gross marine product" (equivalent to a country's annual gross domestic product) of the Western Indian Ocean (WIO) region to be at least USD20.8 billion. The total "ocean asset base" of the region was estimated to be at least US$333.8 billion. Realising the value and importance of the ocean's natural capital, the WIO countries are undergoing rapid economic diversification and transformation with blue economy plans to further utilise their vast coastal and marine ecosystem goods and services. While agriculture, tourism and fisheries continue to be the mainstay in WIO economies, new sectors such as oil and gas, coal, mineral, and sand mining concessions are increasing in the region (ASCLME/SWIOFP 2012).

Developing a blue economy in Africa aligns closely with the African Union (AU) 2050 African Integrated Maritime Strategy (AIMS 2050) and the African Union Agenda 2063 – The Africa we want. In particular, Goal 6 of the agenda specifies that "Africa's Blue/ocean economy shall be a major contributor to continental growth and transformation through (1) Sustainable exploitation of marine resources and energy and (2) Streamlining of port operations and aquatic transport. Furthermore, Goal 7 of the strategy recommends sustainable use of resources through natural resource management and biodiversity conservation. The African Union also recognises the challenges (eg illegal fishing, pollution and piracy) that its member states face in realising the full potential of the blue economy. Therefore, the Africa Blue Economic

Strategy established a clear vision for the continent towards developing an inclusive and sustainable economy (AU-IBAR 2019). To achieve this vision and goals for the region, marine spatial planning (MSP) is one of many tools that can be used to build an inclusive blue economy that prioritises sustainability.

MSP, as defined by the Intergovernmental Oceanographic Commission (IOC) of UNESCO, is "a process of analysing and allocating parts of three-dimensional marine spaces (or ecosystems) to specific uses or objectives, to achieve ecological, economic, and social 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 participating in the process" (http://msp.ioc-unesco.org/about/msp-facts/).

Various decisions and agreements were established at the previous Conference of the Parties (COP) to the Nairobi Convention[1]. MSP was identified as a tool for sustainable blue economic growth, capacity building, conservation and area-based management. Developing MSP in the region is also one of the priority areas of the Nairobi Convention Work Programme 2018-2022. Furthermore, the Nairobi Convention expressed the need to strengthen ocean governance in the WIO and apply MSP to achieve the Aichi Biodiversity Targets and the SDGs at a regional capacity building workshop held in Kenya in 2018. It was acknowledged that "MSP shows great promise if built on a foundation of reliable information, coupled with appropriately (multi-) scaled governance and institutions. MSP is useful to mitigate multi-sectoral stakeholder conflict, at multiple levels of coastal and ocean governance" (Nairobi Convention, 2018). Lastly, the need for a regional MSP strategy was emphasised 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. Here, the Nairobi Convention Secretariat was requested to work with partners to develop a regional strategy.

Although some of the WIO countries have developed spatial management plans and started implementing MSP, different coastal and marine economic sectors are still being managed individually, resulting in a lack of coordination in decisions and actions that negatively impact coastal and marine ecosystems goods and services. It is essential to apply a harmonised approach in developing coastal areas and utilising coastal and marine resources and space among all the competing needs and associated stakeholders. To achieve this, 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 context provides an opportunity for joint learning, improved cooperation, and capacity building to support MSP implementation across the WIO region consistently. A regional strategy will aim to harmonise policy and legislative structures towards common goals and objectives of an ecosystem-based approach to ocean management, as endorsed by decisions at CoP 8 and CoP 9. A regional approach will provide a coordinated structure for knowledge and data sharing, incorporate broad stakeholder engagement and increase communication and collaboration with relevant organisations in the region. The regional MSP strategy will provide guidelines to achieve these overarching goals; however, successful implementation of sustainable development and planning will still rely on each country's ability to implement MSP in its national context.

Linkage to regional and global processes

The use of MSP as a tool to achieve global and regional objectives is emphasised by existing initiatives such as The IOC-UNESCO MSP programme, MSPglobal (international guidelines, pilot projects, roadmaps, expert panel), GEF LME: Learn platform with an MSP Toolkit and the European Union (EU)-MSP platform, among others. Numerous MSP projects linked to these platforms and initiatives emphasise the importance and value of conducting MSP to address challenges associated with conservation, area-based planning and management, sustainable growth and the cross- and transboundary issues associated with planning in the marine and coastal environment.

At a regional level, the development of MSP initiatives in the WIO is a key deliverable and output of ongoing regional projects such as the Strategic Action Programme for the protection of the Western Indian Ocean from land-based sources and activities (WIOSAP) and Western Indian Ocean Strategic Action Programme Policy Harmonization and Institutional Reforms (SAPPHIRE) funded by the Global Environment Facility (GEF) (Nairobi Convention, 2020). A regional MSP strategy will also build on the extensive

work that has been conducted in areas beyond national jurisdiction (ABNJ) (Wright and others, 2019), including understanding connectivity in the WIO (Maina and others, 2020, Popova and others, 2019), area-based planning (Macmillan-Lawler and others, 2018, Rochette and Wright 2015, UNEP-WCMC 2019a) and other research linked to the ABNJ Deep seas project. A framework for MSP in ABNJ has also been developed (UNEP-WCMC 2019b). These documents and reports will help guide the development of a regional MSP strategy. Collaboration among these research groups will establish valuable networks and capacity for MSP implementation at a regional scale. Furthermore, at a regional level, an MSP strategy for the WIO will build on and use valuable data and outputs from previous projects in the region, such as the detailed transboundary diagnostic analysis (TDA) linked to UNDP- supported GEF-financed Agulhas and Somali Current Large Marine Ecosystems (ASCLME) Project and the World Bank-supported GEF-financed South West Indian Ocean Fisheries Project (SWIOFP).

The Western Indian Ocean Regional Marine Spatial Planning Strategy

This paper presents the main aim and objectives of the MSP strategy and the process towards its development to date, including key concepts and strategic priorities to be included in the document. The overall purpose of the strategy is to support the WIO with principles and guidelines for national MSP initiatives that will address transboundary and cross-sectoral challenges. One of the main priorities of this project was to be as inclusive and transparent as possible, to develop a strategy that addresses the main needs and challenges in the WIO. A preliminary situational assessment included a stakeholder mapping exercise to identify the high-level institutions associated with MSP in the region and the key stakeholders that are either currently involved in MSP in the WIO or are likely to be key role players in the future MSP initiatives. Furthermore, 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. The TWG (two representatives from each country) were consulted to provide information and MSP updates for each of the respective member states.

The situational assessment was conducted to (1) broadly review regional and national policies, legislation 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 assessment aimed to apply this information to the development of the MSP strategy, identify opportunities for cross-border MSP across different governance structures, and provide broad guidelines and recommendations for MSP implementation at a national level in the region. Building on two preliminary reports, data and information for the situational assessment were gathered through a detailed literature review incorporating online grey literature and published reports but also published scientific articles. Additional national-level information was obtained through broader stakeholder engagement.

In an attempt to apply a bottom-up approach to developing the MSP strategy, a series of discussion questions were posed to the TWG and relevant stakeholders to identify the key issues in the region and challenges for MSP implementation, the main objectives and strategic priorities that should be included in a regional MSP strategy, and to identify the potential uptake and feasibility of MSP at a national level. Responses (n=19) were used to develop an online questionnaire, to which there were 28 responses, to develop the strategy further. Input from the TWG and stakeholders was used to determine the main challenges (governance issues and threatening processes) that need to be addressed in the WIO, the overall vision and goals for the MSP strategy, and a set of strategic priorities for MSP implementation, along with enabling mechanisms for implementation. Based on a series of foundational principles, this information was synthesised into a structural framework to guide MSP at a regional scale in the WIO (Figure 1).

A Systems Thinking Approach to Marine Spatial Planning

The regional strategy introduces and supports a systems thinking approach (see Figure 1: "Systemic perspective of strategic priorities"), previously articulated by the United Nations for green economy policymaking (UNEP 2014). Systems thinking and modelling encompasses a broad set of skills, tools, approaches, and processes well suited to complex, interconnected problems. The holistic nature of a systems perspective encourages the breaking down of the mentality of remaining in separate 'silos' (ie disciplines, departments, organisations). It requires that we overcome
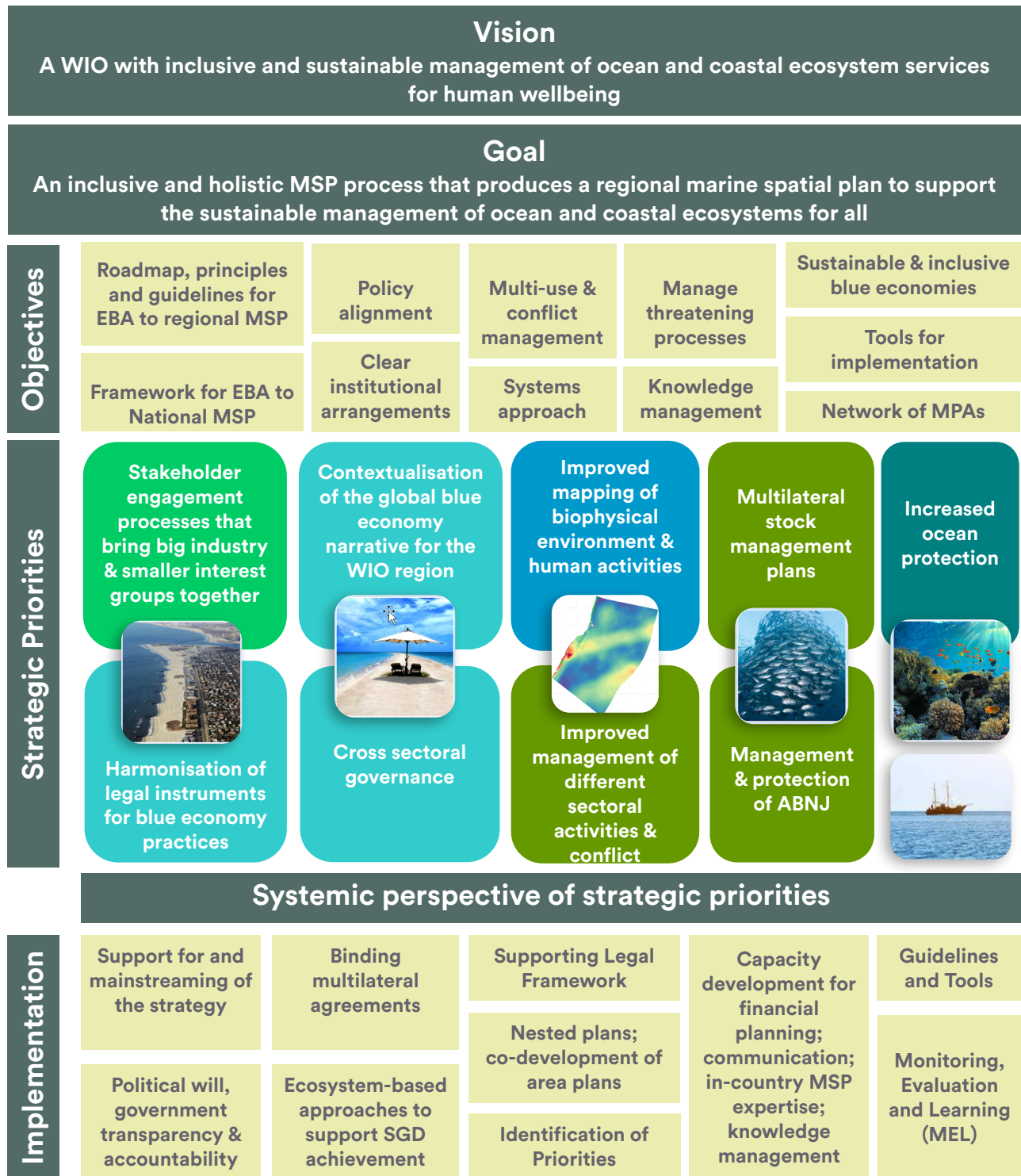
Figure 1. A structural view of the regional Marine Spatial Planning strategy for the Western Indian Ocean, based on questionnaire responses from the Technical Working Group members of member states of the Nairobi Convention and civil society stakeholders.

short-term and short-sighted decision-making while seeking a balance between a high-level (ie strategic) and more detailed (ie operational) perspective, helping to "see the forest for the trees" (https://learning-forsustainability.net/systems-thinking/). Using systems theory as an approach involves making 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 unintended negative 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.

Furthermore, it involves developing testing policies in a simulation environment, for example, by building simulation models (currently being developed at Nelson Mandela University as part of the Algoa Bay Project (https://algoabayproject.com/)). Another benefit of using the systems thinking approach is that it can consider the roles and impacts of time, area and scale on decision-making. Decisions made for a given area at a given time will have impacts (positive or negative) across space and times in the future. Therefore, novel systems thinking approaches will help identify these complexities and demonstrate their relationships, which is key to adopting MSP in the WIO region. The regional MSP strategy will not focus on providing solutions. Still, it will demonstrate how stakeholders can articulate desired scenarios for their country and the region and then understand how a regional MSP strategy can assist them in achieving their desired scenarios for effective management of their marine and coastal resources. The MSP strategy will serve as a guiding document to assist regional and national implementation of ocean governance systems and mechanisms. Achieving regional and international goals and overall ocean sustainability will depend on the effective implementation of the MSP strategy (among others) and activities in the region.

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:

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 to support 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 (eg SADC), regional fisheries

management organisations and other regional bodies and commissions (eg 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 practices.
- 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 integrate 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

In conclusion, this strategy will be presented to the Tenth Conference of Parties to the Nairobi Convention (COP10) in November 2021 for consideration as an appropriate guidance document for the region. A complete draft of the strategy and its Appendices will be available from the Nairobi Convention Secretariat thereafter.

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