

# PERSPECTIVES ON HOW DIGITAL TRANSFORMATION MAY BE USED TO IMPROVE MARINE SPATIAL PLANNING ACROSS THE ATLANTIC SPACE

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## 1. The concept of MSP and its role in global sustainable ocean governance

As demand for ocean and coastal space and resources intensifies, so does the need for integrated, multi-sectoral, area-based management and decision-making to balance cross-sectoral interests, and to create pathways for sustainable growth and achieving environmental, social, or economic priorities. Marine spatial planning (MSP) is an opportunity to better understand the marine environment and manage it in a more transparent and inclusive manner, leading to greater certainty for developers, communities, regulatory bodies, and the public regarding the use of marine space (Ehler & Douvère 2007, Ehler, 2021).

UNESCO-IOC have defined Marine Spatial Planning (MSP) as a “public process of analysing and allocating the spatial and temporal distribution of human activities to achieve ecological, economic and social objectives that are usually specified through a political process” (IOC-UNESCO, 2009). It is an integrated approach for area-based marine management that is designed to overcome the challenges wrought by single-sector management, helping to balance trade-offs and decision-making across environmental, social, and economic priorities. MSP promotes ecosystem-based management to develop integrated, multi-objective marine plans, using participatory approaches to decision-making to ensure equitable outcomes and fostering buy-in for implementation. MSP can also be effective at supporting long-term adaptive management which is particularly important in the context of sustainable ocean governance.

MSP is increasingly being adopted or trialed around the world, growing from 9 MSP initiatives in 2005, to over 300 across 102 countries/territories in 2022 (IOC-UNESCO, 2021). Most completed plans are in the Northern Atlantic, following legal requirements in Europe, America and Canada, whilst in the South Atlantic such as Africa, Americas, and the Caribbean, MSP is in early development. In practice, MSP is considered an enabler for sustainable ocean governance because it:

- Identifies locations for new and emerging uses following an ecosystem-based approach;
- Mitigates conflict between sectors;
- Promotes multi-use spaces for coexistence and synergies;
- Increases marine investor confidence by introducing transparency and predictability;
- Facilitates filling critical knowledge gaps on the ocean and key sectors;
- Can foster collaboration across borders for regional development;
- Promotes capacity building through innovative and transformative technologies.

## 2. Atlantic African Countries' Adoption of MSP in Their Development Agenda

The Abidjan Convention (AC) provides an overarching legal framework for all marine-related programmes for the Atlantic African countries. In West Africa the Abidjan Convention have supported MSP development in Ghana, Benin, and Cote D'Ivoire through the Mami Wata project. MSP is one of the key tools AC is using to support member states to move towards integrated ocean management. The Ecologically and Biologically Sensitive Areas (EBSA) and State of the Marine Environment (SOME) were tools employed and expected to produce information that is relevant to MSP development in the region. For example, the EBSA tool helped identify areas that

are ecologically or biologically important. These areas can be incorporated in the MSP process as areas that should have a particular management focus to ensure that human activities have minimal impact on biology and/or ecology of these areas. Similarly, SOME identifies issues and potentially areas that need MSP action.

Beyond projects supported by the Abidjan Convention, there have been MSP relevant projects such as PADDLE project (Planning in a liquid world with tropical stakes) that aimed at developing a more inclusive community about MSP across the tropical Atlantic as well as case study areas in Senegal and Cape Verde. Beyond these projects, other regional project such as the West African Coastal Areas (WACA) Resilience Investment Project and the West Africa Biodiversity and Climate Change (WA BiCC) Project have considered the implementation of Integrated Coastal Zone Management (ICZM) and MSP with the goal of addressing coastal resilience, climate change and strengthening legislative and institutional capacity. The MAVA West Africa programme focuses on the coastal zone of seven countries (Cabo Verde, Mauritania, Senegal, The Gambia, Guinea Bissau, Guinea, and Sierra Leone) to address biodiversity threats. It is planned that the project will consider the use of MSP to support the conservation of six priority species and habitats (including sea turtles, coastal wetlands, seabirds, mangroves, seagrass, and small pelagic fish). The Regional Network of Marine Protected Areas (MPAs) in West African (RAMPAO) is another regional initiative of relevance for MSP in West Africa. The RAMPAO was founded in 2007, with 27 MPA members located within the sub-region comprising Mauritania, Senegal, Cape Verde, Guinea Bissau, Guinea, the Gambia, and Sierra Leone to maintain critical habitats necessary for the dynamic functioning of ecology.

A recent study conducted by the African Union InterAfrican Bureau for Animal Resources (AU-IBAR) noted that most coastal countries in West and Central Africa are in the preparatory or early stages of their MSP development (AU-IBAR, 2023). At this level, the countries have: held national MSP workshops and training; have existing sector legislation that can potentially support MSP; and consider MSP within a broader framework of ocean governance initiatives e.g., blue economy strategy and ICZM. Ghana, Cote d'Ivoire, Benin and Senegal were reported to be at intermediary level, where they have an existing legislation on MSP and/or a competent MSP authority and/or a pilot MSP project. Notably, the study reported that Cape Verde is at an advanced level of MSP development as it has an approved Management Plan for the Coastline and the adjacent Sea of the island of Boa Vista (POOC-M) that covers some part of the marine area through statutory legislation.

### **3. Challenges for the uptake and implementation of MSP**

The review of recent literature shows that there are similar global challenges to MSP implementation in addressing multi sectoral objectives (see Box 1). The different challenges for the uptake and implementation of MSP are all connected to the limited data and evidence as well as practical MSP tools to support decision making.

#### **Box 1 Challenges of MSP based on global MSP cases and recent literature**

- The lack of data and evidence to support MSP has been widely noted in most MSP processes. There is a predominance of descriptive data, which describes the marine environment, but less analytical information, which is where the challenge lies in developing. There remain challenges in how to aggregate and interpret data in order to acquire the information needed by marine spatial planners.

- MSP practice shows that trade-offs are rarely addressed explicitly or transparently in most MSP processes as they often go unrealised, are poorly evaluated, or not properly framed as part of policies (Walsh, 2022). Although trade-off analysis has been explored through decision-making tools and the lens of ecosystem services, they have rarely been used to explicitly inform MSP options and decision making (White et al., 2012). The lack of a trade-off frameworks and tools limits the value of MSP especially when plans do not allocate where activities will take place at sea or set out differentiated priorities for the use and protection of marine space.
- Many MSP efforts stop after describing the current situation and develop a management plan that only addresses these issues (Ehler et al., 2019). There are currently few marine spatial plans that define ‘where we want to go’ through, for example, spatial scenarios, and ‘how do we get there’ through MSP management plans. This gap is partly informed by the limited digital tools that can support real time and real-life simulation of how decisions can impact the marine environment.
- Few studies have concluded there is limited evidence that MSP has explicitly influenced decision-making, and this has been attributed to the lack of specificity in policies and organisational disconnect between plan makers and decision makers who are new to MSP (Slater and Claydon, 2020). Decision makers are often time poor; data limited and may prioritise engagement and use of other legislative requirements such as Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA) over marine spatial plans.
- There are MSP cases where certain communities and stakeholder groups are excluded, which has led to social resistance and a lack of legitimacy of the planning process, thereby reducing process efficiency (Flannery, 2023). Recent studies have identified cases where the MSP appears to be inclusive but, in reality, participation has been a ‘tick-box’ exercise with little meaningful public engagement. The social dimensions of MSP are currently the subject of one of the most intense debates in MSP research, and it has been pointed out that rather than a “rational” process, MSP is in fact a highly politicised process which requires power redistribution to cater for marginalised people and equitable distribution of benefits (Flannery, 2023).

#### 4. MSP Dependence on Data Accessibility and Usage for Planning and Monitoring

The best way to increase transparency of the MSP process is to support decisions, actions and process management with evidence that is based on reliable data and spatial information. This spatial information is a critical component of the data requirements for marine spatial planning, and enables analysis for:

- An understanding of the current status of the marine environment;
- Developing objectives of marine conservation;
- Consideration of land-sea interactions;
- Identification of conflicts and synergies among the maritime sectors and coastal activities;
- Understanding of the socio-economic and governance situation in coastal communities and beyond;
- Space allocation for emerging marine uses

Although MSP is dependent on data, digital tools for planning and monitoring it is still faced with data gaps and challenges. These include:

- Limited availability of suitable data sets in consistent manner (i.e. compatible formats) across sea basins and regions, coherence across boundaries.
- Difficulty in disaggregating information between land and sea.
- Paucity of data or information on land-sea interactions, e.g. degree to which coastal communities are dependent on their links to adjacent seas and the potential for them to benefit from growing maritime sectors.
- Limited access to social, economic, sector and governance data
- Gaps and weaknesses in historical time series and ensuring data quality
- Limited access to and capacity in handling tacit knowledge in a transparent manner.
- Limited spatial data about future sector trends and developments.
- Transboundary specific challenges: language issues, political agreement, cooperation between local and regional interest groups.
- Limited technology for monitoring offshore activities within planning spaces

## 5. Digital Tools That Enhance MSP

Geoinformation (digital data for communicating local spatial meanings) is crucial for guiding MSP decisions, given the increased digitalisation of marine environmental governance in recent times. They comprise spatially referenced data that reproduce the characteristic features of a phenomenon in space in different forms. Digitalisation and the use of digital technologies (geotechnologies) within the marine environment offer enormous scaling potential in both economic and environmental terms (Biber et al., 2022). Geotechnologies enhance the use of such geoinformation, by allowing for the collection, analysis, processing, representation and circulation of geoinformation. Geotechnologies include tools such as Geographic Information Systems (GIS), Decision Support Tools (DST), and geoportals (Davret et al., 2023). Geoportals are becoming central to MSP, because they potentially aggregate and integrate data from different sectors and sources and contribute to modelling the environment as layers of data to be queried, combined, and analysed in various ways. In the Atlantic ocean, existing geoportals include SNIMar, Tools4MSP and the atlas of legal rules applying to Senegal's marine environment developed as part of the PADDLE project.

Digital twins of the ocean (DTO) is a new tool developed to bring relevant ocean data and information from different sources into new contexts. They are virtual representations of the ocean with its physical, chemical and biological properties, based on ocean observations and ocean models with the purpose of what-if scenarios for decision making. The Maritime Spatial Planning Challenge (MSP Challenge, 2023) is a next generation planning support game that also features a virtual and augmented reality module called Ocean View. The developers are a partner in the EU funded Digital Twins of the Ocean project Iliad (Iliad, 2022), where they aim at further development and linking the platform to the project's Digital Twins of The Ocean (IHO, 2023).

## 6. Recommendations for Promoting Digital Connectivity to Advance MSP in the Atlantic

The following are recommendations for promoting digital connectivity to advance MSP in the Atlantic:

- A comprehensive assessment and scoping of existing data and digital tools across the Atlantic in the context of MSP will be useful for informing current and future approaches to MSP. Such a study should consider understanding: a) what data and information exist and is actually needed by planners at different stages of the planning process, b) which data categories and data sets this translates into, and c) what are the key knowledge gaps.
- There is the need for linking data collection efforts within countries and across the Atlantic area. This will be an effective way of ensuring that MSP is based on sound environmental, social and economic evidence into a central repository, and providing access to decision makers, regulatory bodies and developers. This could be implemented through various pan-Atlantic data collection tools and data portals to improve access to aggregated and harmonized data. Such initiatives should consider gathering data from different countries that harmonizes data for transboundary activities such as sub-sea cables, fisheries, shipping and marine protected areas.
- Digital tools that can support MSP to carry out assessments and solutions to conflicts and analysis of the spatial dimension of future trends, will improve MSP evidence-base. This could be delivered through exchanging existing spatial evaluation tools for assessment, and impact and conflict analysis.
- It is important that exchange of practices, which relate to the aggregation and interpretation of data and information as well as digital connectivity are promoted across the Atlantic.

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