



OPERATIONAL BRIEF

Marine Spatial Planning

BLUE ECONOMY FOR RESILIENT AFRICA PROGRAM

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About the Blue Economy for Resilient Africa Program

The Blue Economy generated nearly US\$300 billion for the African continent in 2018, creating 49 million jobs in the process. These and other crucial benefits—most notably food security, livelihoods, biodiversity, and resilience to the effects of climate change—are entirely dependent on the health and productivity of coastal and marine areas.

By safeguarding productive coastal landscapes, countries will be in a better position to take full advantage of future Blue Economy opportunities, which range from sustainable blue energy to aquaculture to blue carbon.

The World Bank's Blue Economy for Resilient Africa Program, announced at COP27, will provide multisectoral analytical, financial, and policy support to Africa's coastal countries and island states to help them leverage the opportunities—and manage the risks—inherent in scaling up their Blue Economies.

About this series of briefs

The Blue Solutions for Africa series of operational briefs captures how a thriving Blue Economy can help African countries better manage the development challenges they face while supporting economic growth, sustainable livelihoods, and the health of these precious ecosystems.

THE BRIEFS COVER THE FOLLOWING THEMATIC AREAS

- Climate change
- Coastal and marine biodiversity and habitats
- Sustainable fisheries
- Marine pollution
- Jobs and livelihoods
- Participatory marine spatial planning
- Data management and knowledge creation
- Innovative financing instruments
- Developing and incentivizing institutions
- New frontiers of innovation



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Key Messages



Marine spatial planning (MSP) is a powerful tool for effective, participatory coastal and marine management.



Given the centrality of climate change as an amplifier of current risks and pressures on coastal environments, climate-informed marine spatial planning considers current and future climate risks and opportunities during the design, planning, and implementation of programs.



Marine spatial planning can help design coordinated coastal resilience programs at scale and identify possible low-carbon development and growth pathways. This type of spatial planning can integrate measures articulated in nationally determined contributions and other instruments, budget for those measures, and monitor their progress.



Climate-informed marine spatial planning can help the private sector better understand climate risk and invest in mitigation and adaptation measures to reduce it and improve profitability, while respecting the space required to maintain a healthy and productive coastal environment.



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Introduction

Governments face the complicated challenge of needing to make policy decisions relating to coastal and marine ecosystems in the absence of a well-established body of knowledge about such systems. To complicate matters, the benefits that marine and coastal ecosystems deliver—which include resilience to climate change—are highly contested and, ironically, vulnerable to the effects of climate change.

Marine spatial planning (MSP) provides a framework for managing these tensions. By including a broad range of stakeholders in participatory mapping and decision-making processes, MSP reduces investment risk and improves investor confidence. This is important because Africa's Blue Economy will require substantial private sector investment.

This brief sets out how MSP can help governments better manage the dual challenges of climate change and biodiversity loss in a collaborative, participatory manner that considers both present and future uses and creates an attractive environment for private investment into the Blue Economy.



The Challenge

For policy makers in Africa and elsewhere, marine and coastal policy—the rules that govern who gets to do what, where, and how in the ocean and on the coast—poses a unique challenge, one in which they must balance traditional interests (like artisanal or industrial fishing, tourism, and shipping), with new ones (like offshore renewable energy generation, desalination, and marine bio-prospecting).

Designing and implementing policies that solve this dilemma in an equitable manner is difficult even where the interactions between economic activity and natural processes are fully understood. In Africa, despite progress over the past 20 years, institutional weaknesses and inconsistent financing limit the quality of data, leading to poor knowledge management and difficulties in addressing emerging challenges in various development sectors.

Working across sectors and using transparent, participatory processes and tools are essential for developing a holistic view of the ocean, one that spans across ecosystems, sectors, and infrastructure types. MSP is one such tool, and an especially relevant one if we also wish to design coastal and marine spaces that are able to meet the dual crises of climate change and biodiversity loss.

Biodiversity and climate change are inextricably connected, with shifts in either crisis reinforcing, compounding, or contributing to other ways that can cause global economic and wellbeing losses. Losing key natural ecosystems hinders our ability to mitigate and adapt to climate change and, conversely, climate change is one of the main direct drivers of nature loss.

Current and expected trends for marine biodiversity make it more important than ever to mainstream nature in decision-making, particularly when it entails climate change. This requires spatially explicit information that decision-makers can act on, focusing on climate change impacts paired with the location, state, and trends of biodiversity and ecosystems that coastal and marine economies depend upon.

Lack of public and private finance is still a major constraint to meeting African countries' global environmental and climate change commitments. MSP provides an opportunity to better understand climate change and environmental considerations in the marine space, and therefore facilitate investments in measures that will reduce impacts and improve the profitability of blue investments.

Coastal and marine spatial plans can help close the funding gap by including actions to meet climate change commitments. For example, a plan can help optimize the use of marine areas while allowing for economic development. Part of the optimization may be to give areas of maximum carbon sequestration more protection to help meet nationally determined contribution commitments.

What is Needed

MSP is the process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives specified through a political process. This process provides a solid foundation to integrate sectors, to make the case for needed investments, and to effectively engage the public and private sectors and civil society.

MSP DEALS WITH UPSTREAM ENVIRONMENTAL AND SOCIAL ISSUES BY GIVING CERTAINTY TO PUBLIC AND PRIVATE INVESTORS TO ACCESS AREAS AND RESOURCES. ITS KEY STEPS—WHICH ARE NOT NECESSARILY LINEAR—ARE:



Make the case. The process should begin with enabling discussions on the benefits of MSP, considering goals that move beyond an increase in wealth. These goals can include enhanced climate resilience, biodiversity, social equity, and pollution reduction. MSP entails a major shift from managing marine resources on a sector-by-sector basis to taking an integrated approach.

A good understanding of the economics underpinning the allocation of resources and space is a prerequisite for securing sustainable finance for MSP and plan implementation. De-risking and leveraging sector-specific portfolios through integration is another powerful argument.



Create enabling conditions. Successful MSP efforts require clear and transparent legal frameworks and processes to build certainty for investors who seek predictable decision-making. Like most planning processes, MSP processes typically involve trade-offs, creating winners and losers. Transparency and certainty increase the likelihood that actors who do not get everything they hope for, or who are asked to make sacrifices, do so willingly.



Formulate the spatial plan. This is a critical step for developing a future investment portfolio in the coastal marine space. Planning effectively identifies public- and private-sector investment opportunities across existing and emerging sectors by allocating marine space and establishing rules for sectors to operate within it. A good plan will integrate sectors and find the right balance between existing and future uses. This may require innovative approaches such as co-location of uses, which in turn can attract investments that might otherwise be scarce.



Implement the plan. Implementation is the step where the investment portfolio envisioned in the plan is realized. This is the stage where transformational change, such as establishing specific use areas, happens. Implementation is often more effective when it has a schedule that is aligned with specific sector needs and guides stakeholders and investors.



Spotlight

WORKING ACROSS SECTORS TOWARDS A RESILIENT BLUE ECONOMY

Coastal and marine spatial planning (MSP) provides a framework for balancing competing demands for coastal and ocean resources and areas. It allows stakeholders from all sectors—including communities and citizens—to explore and negotiate the most appropriate use of resources and coastal-ocean space for current and future uses.

From the perspective of the public sector, MSP can (and should) account for climate change by facilitating mitigation measures and ensuring that the plan can adapt to potential future climate change impacts. The process also provides safeguards for public goods and ecosystem services, such as biodiversity conservation, and it also ensures access to resources for recreation and cultural purposes.

By using an integrated approach to develop current and emerging marine sectors, future decision-making is more efficient and effective. MSP significantly reduces the need for future conflict resolution. Approving permits aligned to management measures in an MSP is also a more straightforward process, reducing financial costs and saving time for both the public and private sectors.

The estimated market value of marine and coastal resources and industries is **US\$2.5 trillion per year, or about 5 percent of global gross domestic product**. Securing the ocean's capacity to continue making this contribution—in support of both the global economy and the Sustainable Development Goals—will require billions of dollars of investments, much of which will need to come from the private sector.

From the private sector's perspective, MSP can provide some certainty regarding access, tenure, and the ability to

operate in coastal and marine areas, paving the way for it to undertake these investments. Terrestrial systems with land tenure arrangements that legally grant ownership—and often the right to sell—make land ownership a tangible asset. Unlike land ownership, the exclusive economic zones of most countries are not based on a tenure system or involve tangible assets, which discourages many private investors. Coastal and marine spatial plans, combined with a permit (or similar system), can help to address this issue.

MSP helps to deal with environmental and social issues upstream of investment decisions, creating a more favorable investment climate. A coastal/marine spatial plan gives investors a degree of certainty that project delays and stoppages are unlikely—especially if they take part in planning, because they have already had the opportunity to discuss environmental concerns or conflicts with other users. The planning process also improves transparency in permit allocation and other decisions made relating to the marine sector.

How the World Bank Group Contributes to Solutions

The World Bank draws on its financial instruments, convening power, and technical expertise to support African countries as they address the dual challenges of climate change and biodiversity loss through MSP.

This support includes helping to identify trade-offs and synergies between climate action plans across marine sectors, data sharing, capacity building, and institutional strengthening. The World Bank is playing a catalytic role in the development of the MSP agenda by developing and applying [integrated management tools](#) to country and regional operations. The World Bank's PROBLUE program has seen a global increase in the use of the spatial planning tools, from three countries in 2020 to 19 in 2022, all of which are informing the preparation and implementation of lending operations. [Morocco](#) and [Mozambique](#) are just two of the African countries that are taking the lead in this, and [West African countries](#) are leading at a regional level.

The World Bank and the International Finance Corporation (IFC) contribute to country and regional MSPs by coordinating efforts to increase private sector investment in marine sectors. In particular, the MSP efforts supported by the World Bank provide a solid enabling environment for private sector investment. In 2018, Seychelles issued [the world's first sovereign blue bond](#). IFC has developed similar bonds for the [Philippines](#) and [Thailand](#).



Blue bonds have the potential to mobilise private sector investment to foster a sustainable Blue Economy, while supporting ocean conservation, fostering the generation of economic benefits for sustainable ocean-linked activities, and restoring the coastal and marine ecosystems on which we depend. Blue bonds can also have co-benefits, improving livelihoods and jobs for people working in and around the ocean. As capital flows into the Blue Economy grow, establishing and maintaining investor confidence is crucial. MSP could provide this confidence.

Toolkit

THE MARINE SPATIAL PLANNING TOOLKIT

The World Bank Group recently produced [Marine Spatial Planning for a Resilient and Inclusive Blue Economy](#), a toolkit comprising a series of guidance notes and factsheets related to the different MSP phases, and the [data and tools](#) to inform these efforts.


The toolkit includes [economic tools](#) to balance marine uses and addresses [key cross-cutting themes](#), such as [gender and marginalized people](#), [climate change](#), and [biodiversity](#).

Marine spatial planning (MSP) guides policy developments, institutions, and investments to build back better after COVID-19 impacts. By reducing investment risk and improving investors' certainty in accessing marine resources, MSP provides a comprehensive and integrated investment framework, as well as a financial and social rationale for the Blue Economy.

The toolkit was developed with financial support from [PROBLUE](#) using a collaborative approach that drew on inputs from a broad range of specialists within the World Bank and International Finance Corporation.

Marine spatial planning in Africa

SEVERAL AFRICAN GOVERNMENTS ARE IN THE PROCESS OF DEVELOPING MSPs OR HAVE ALREADY DONE SO AND ARE AT VARIOUS STAGES OF IMPLEMENTING THEM WITH THE WORLD BANK'S SUPPORT.

 **Mozambique has developed the world's first national marine spatial plan, which came into effect in November 2021.** Through the First South West Indian Ocean Fisheries Governance and Shared Growth Project (SWIOFish1), the World Bank provided financial and technical support for Mozambique to develop its first national marine spatial plan (POEMN). Approved in November 2021, the POEMN set out a vision and guidelines for the development and management of Mozambique's national marine space, as defined under the United Nations Convention on the Law of the Sea, considering both current and potential marine uses. The POEMN was developed through a broad participatory process led by the [Ministry of Sea, Inland Waters and Fisheries](#), involving the engagement of more than 15 ministries at national and subnational level, and consultations with dozens of organizations from the private sector, civil society, and academia. As an example of its proposals, based on a collaboration between Mozambique's National Oceanographic Institute and the Wildlife Conservation Society, the POEMN spatially defined priority areas for considering the establishment of additional marine protected areas, in line with the [High Ambition Coalition for Nature and People's](#) goal of achieving the protection of 30 percent of the world's ocean by 2030.

 **Guinea is developing a marine spatial plan that draws on spatio-temporal data on mangrove ecosystems and land cover, generated with the assistance of the United States National Aeronautics and Space Administration (NASA).** In addition, Guinea is drawing on coordination support from the World Bank's West Africa Coastal Areas Management Program to develop a detailed section within the regional coastal master plan that focuses on coastal risks. As part of this spatial planning effort, Guinea is also developing a marine legal environmental atlas that includes mining, oil, fisheries, and protected areas data. A pilot analysis on boating activities in the country's exclusive economic zone, based on automatic identification systems and vessel monitoring systems data, has been launched.

 **Tanzania is mapping its capital city, Dar es Salaam, as part of a broader urban coastal resilience effort.** The mapping exercise is being conducted by [Tanzania Urban Resilience Program \(TURP\)](#), a partnership between the United Kingdom's Foreign, Commonwealth & Development Office and the World Bank, which is also providing coordination support for a multistakeholder process that aims to transform the city's Msimbazi river from a hazardous, flood-prone liability into an iconic city park surrounded by prime real estate for urban development. In addition to these efforts, TURP is also driving a greening initiative in the capital that included the development of [guidelines](#) for sustainable urban drainage systems, green public spaces, and general nature-based-solutions for the purposes of flood attenuation, reduction of saline intrusion into groundwater, urban heat reduction, and erosion prevention or control.

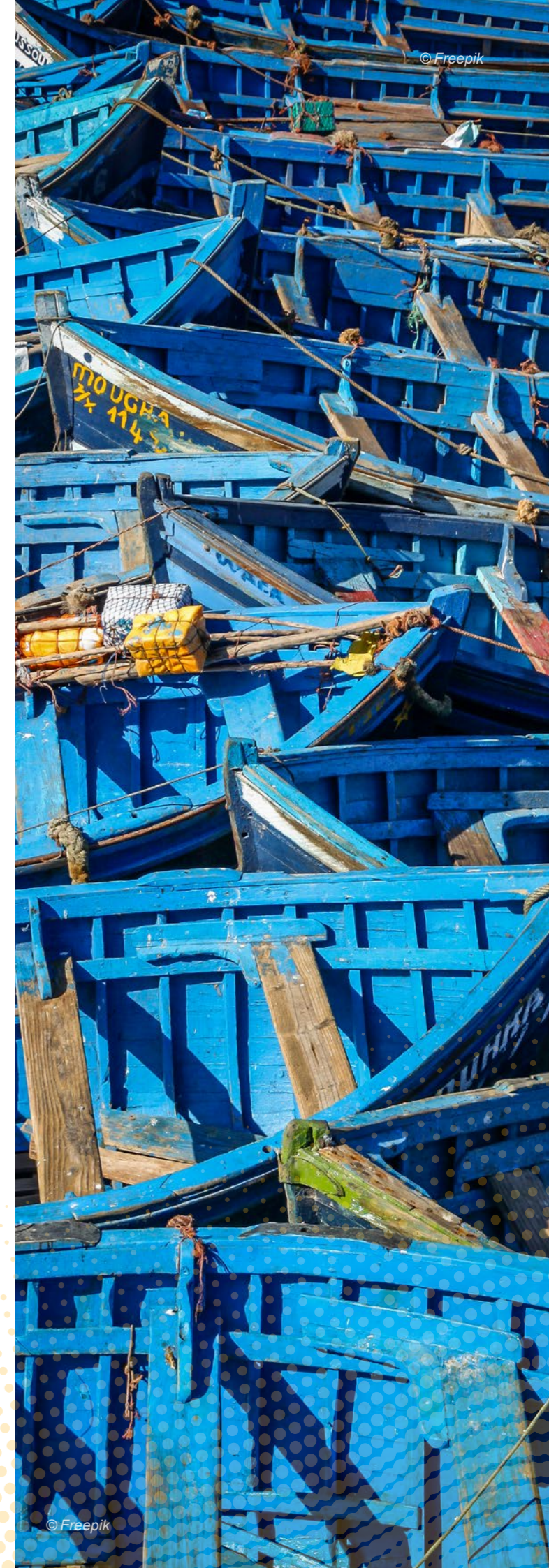
 **Morocco is planning to declare a new marine protected area.** In Agadir, the Souss Massa region, the Government of Morocco is drawing on MSP, stakeholder participation, and web-based geographic information system (GIS) support from the World Bank to identify and declare a new marine protected area. The resulting marine protected area will maintain vital processes in the sea, including photosynthesis, maintenance of food chains, movement of nutrients, degradation of pollutants, and maintenance of biological diversity and productivity. In the Rabat-Salé-Kénitra region, the Government of Morocco has launched the National Integrated Coastal Management Plan, which was based on spatial analytics of coastal resources and uses, as well as technical assistance from the World Bank. The plan has identified priority investments to promote sustainable development of the coast. These investments include organizing the artisanal fisheries sector and training fishers on best practices; supporting the rehabilitation of coastal wetlands and stabilization of dunes; and reducing pollution by constructing wastewater treatment plants, and recycling and valorizing plastic waste. To scale up this integrated coastal management approach, the World Bank has worked with the government to design a methodological guide for the development of regional coastline and marine schemes.

IN RECOGNITION OF THE CROSS-BORDER NATURE OF OCEANS, THE WORLD BANK ALSO SUPPORTS REGIONAL MSP EFFORTS.

Recent projects supported include:

- **The creation of the [Observatoire regional des littoraux d'Afrique de l'Ouest \(West African Regional Coastal Observatory, or ORLOA\)](#).** The observatory is hosted by the [Centre de Suivi Ecologique](#) (Center for Ecological Monitoring) in Senegal and was funded through the West Africa Coastal Areas Management Program.
- **Drafting of the regional West Africa coastal masterplan.** The [West Africa Coastal Areas Management Program](#), financed by the World Bank, supports countries' efforts to improve the management of their shared coastal and marine resources and reduce the natural and man-made risks affecting coastal communities. This program developed the [West Africa Coastal Observatory website](#), which compiles data and information from countries and regional partners to track the evolution of the natural and built environment along the coast and marine space. In addition, the program has drafted the regional West Africa coastal masterplan, which provides a detailed analysis in terms of time-evolution, of coastal risk assessment and rating, and challenges.

The observatory and the masterplan are providing the underlying data for the development of marine spatial plans in the region, starting in Ghana, Togo, and São Tomé and Príncipe. This, in turn will ensure that key oceanic sectors such as coastal tourism and maritime transport have the room for economic development, including at the local level, while ensuring that the natural environment has space to fulfill ecosystem services. The spatial planning efforts supported by the World Bank will directly protect mangrove forests, which are among the planet's most effective habitats for capturing and storing atmospheric carbon dioxide. This would help countries meet their goals for reducing carbon emissions while providing other ecosystem benefits, including against coastal erosion and flooding.





Spotlight

USING MARINE SPATIAL PLANNING TO STRENGTHEN MARINE PROTECTED AREAS

MSP allows new MPAs to be strategically located based on high biodiversity value, ecological significance, size, and proximity to human threats or other protected areas, especially in underrepresented regions.

Further, it can be used to:

- **Strengthen ecological and management linkages** between existing MPAs through their siting and engagement of stakeholders
- **Provide a framework** to improve management, protection, and enforcement
- **Provide a participatory and inclusive environment** for all stakeholders, especially indigenous people and local communities that are connected to the MPA, and
- **Identify areas of natural and critical habitat** near MPAs and enhance ecosystems within or near MPAs.



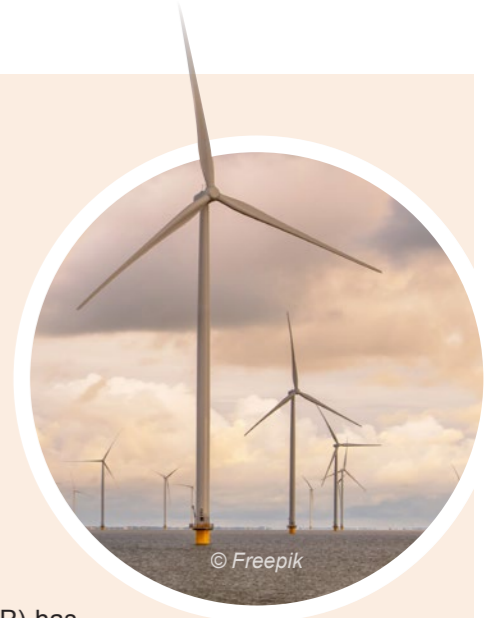
Source: PROBLUE

Case study

THE ROLE OF MSP IN DEVELOPING OFFSHORE WIND MARKETS

Marine spatial planning is helping to plan offshore renewable energy development.

Offshore wind farms need to be carefully placed to ensure the sustainable, responsible, and safe use of sea-beds and water columns, while minimizing the potential risk of ships colliding with wind turbine structures.



The World Bank's Energy Sector Management Assistance Program (ESMAP) has identified four key pillars for the successful development of offshore wind markets: strategy, policy, frameworks, and delivery. MSP plays a key role in each of the pillars (Figure 1), highlighting the importance of including MSP early and throughout the process of developing the emerging offshore wind market.

MSP is a core process for ensuring that offshore wind sites avoid areas of the highest environmental and social sensitivity. To date, ESMAP has drawn on MSP principles in developing offshore wind roadmaps for the Philippines, Vietnam, and Azerbaijan. There is great potential for developing similar roadmaps for coastal countries in Africa.



Figure 1: How MSP relates to the development of offshore wind markets

Source: PROBLUE

What Success will Look Like

Successful MSP considers nature-based solutions where possible. It also involves the participation and support from a wide variety of stakeholders, including the economic sectors that most rely on—and can, in turn, affect—healthy, resilient ecosystems.

NATURE-BASED SOLUTIONS

Rehabilitation and restoration of healthy ecosystems and their services can return many benefits to humans and nature.

Marine habitats like seagrasses and mangroves and organisms such as benthic macroalgae play an important role in climate change mitigation, accounting for 50 percent of carbon buried in marine sediments. Mangroves and seagrasses also dissipate wave energy and trap sediments to build and maintain the sea floor, buffering the impacts of rising sea level and wave action from climate change. Healthy coral reefs can protect against climate hazards by reducing wave energy by an average of 97 percent. Corals and other calcareous algae also provide the major building material of white sand beaches and coastal dunes, which are the last line of protection between the sea and land. Mangroves are expected to adapt to about seven millimeters of annual sea level rise, but this may not be enough.

Establishing limits to urban sprawl and removing or relocating barriers to the expansion of natural ecosystems will allow them to shift inland if space is available, and therefore increase their adaptability to sea-level rise. MSP can help implement solutions such as extending marine protected area boundaries and restoring native species in the context of a wider planning process. Protecting habitats against other stressors will also increase the overall health and resilience of existing coastal habitats and thus their provision of climate change benefits.

Healthy coral reefs can protect against climate hazards by reducing wave energy by an average of 97 percent.

INTEGRATED ECONOMIC SECTORS

A successful MSP process requires participation and support from a wide variety of stakeholders. This support is best generated when marine sectors can see the benefits of using a climate-informed, nature-positive approach. The benefits will vary by sector, as will the measures that investors or managers need to take to reduce their climate change impacts. Possible measures for the major marine sectors are described below.



Fisheries and aquaculture

The Intergovernmental Panel on Climate Change predicts that climate impacts on fisheries productivity will not be uniform and will differ regionally. Some countries will see increased fish production while in others, mainly near the tropics, it will fall. These changes, along with changing fish distributions and migration patterns, greatly increase the risk on food security in coastal communities that rely on fisheries. Coastal and marine spatial plans can use marine protected areas, other closures, and fish management measures to adapt to these impacts. Other approaches include dynamic zoning, which facilitates changing an area's uses and regulations in response to resource distribution dynamics.

Aquaculture's potential role to mitigate climate impacts may include bio-extraction using seaweed. Many seaweeds take up carbon dioxide and nutrients, removing dissolved acids and nutrients and sequestering carbon on the sea floor. Coastal and marine spatial plans can allocate space for aquaculture to areas that are away from critical habitats, transport lanes, and offshore infrastructure to avoid habitat degradation. Other measures, such as improvements in feed efficiency or genetic strains that tolerate a wide range of temperature and salinity levels, can help reduce greenhouse gas (GHG) emissions. Adoption of climate-smart aquaculture technologies may increase species' adaptive capacity and reduce disease and loss of fish through natural disasters such as floods and sea level rise. These benefits ultimately enhance community resilience.



Shipping and transportation

The shipping sector's climate focus is on mitigation measures to reduce ships' GHG emission by at least 50 percent by 2050. Blue ports and transitioning to low- or zero-carbon fuels are important to reaching this target since between 45 percent and 55 percent of the emissions occur while ships are in port. MSP can support the siting process for new bunkering facilities and shipping channels, while preventing and reducing climate, social, and environmental risks. Adaptation is also important, particularly for blue ports, because of sea-level

rise and flooding, wave heights, and changing wind and current patterns. Blue ports can contribute to mitigation and adaptation efforts by ensuring that projects include GHG emission reductions, energy use efficiencies, and climate change resilience. MSP can also consider suitable marine areas for nature-based solutions to deal with dredge spoils, rebuild or relocate climate-proofed blue ports, and reconsider shipping channels.



Offshore renewable energy

Offshore renewable energy encompasses a range of technologies: offshore wind turbines; floating photovoltaic arrays; and wave, tidal, salt gradient, and ocean thermal conversion energy technologies. Offshore wind, which accounted for 34.4 gigawatts (GW) in 2020, has considerable mitigation potential. It also has a critical role in achieving the 1.5°C pathway by providing 10 percent of the needed carbon mitigation by 2050. The 2,000 GW of installed offshore wind capacity that the International Renewable Energy Agency envisions by 2050 would avoid about 4 gigatons of CO₂ per year. Realizing this potential will require investments of US\$177 billion annually until 2050. This investment will primarily be from the private sector, which requires certainty of access to areas for development and prevention of environmental and social risks. MSP can provide that clarity

while supporting climate mitigation. MSP can also decrease conflicts, foster co-location of specific activities, and help stakeholders and policymakers perceive the advantages of renewable energy as part of the Blue Economy. These benefits will, in turn, support meeting national and international commitments and increasing energy supplies from renewable sources. MSP can also contribute to climate change mitigation by prioritizing the allocation or permitting of ocean space to uses that employ new eco-efficient technologies and power sources that tend toward zero emissions (for example, fuel-efficient shipping, electric engines, solar and wind power). At the same time, MSP can limit available space for polluting activities that fail to reduce their GHG emissions.

Spotlight

THE BOUNDARY-BREAKING BENEFITS OF THE MSP APPROACH

MSP offers a transboundary, multi-sectoral solution to address nature loss and promote recovery by:

- Spatially documenting regional and social differences in nature loss, highlighting priority areas, including natural and critical habitats
- Using an iterative, responsive process to address how climate change affects nature loss and communities
- Bringing stakeholders together in a participatory process to better understand cumulative impacts
- Applying a holistic and integrated approach to all human-environment interactions, including those that link land and sea
- Helping businesses move from seeking narrow objectives to multi-faceted, integrated, holistic ones, as well as shifts to nature-smart activities and active restoration of nature
- Helping neighboring governments cooperate on these issues and share relevant data.



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