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SCOPING STUDY TO DEVELOP A MEDITERRANEAN PILOT ON MEASURING THE SUSTAINABILITY OF THE MEDITERRANEAN BLUE ECONOMY

vol 2: Developing a Framework for Blue Economy Sustainability in the Mediterranean

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Executive summary

The Mediterranean region relies to a great extent on blue economy sectors such as tourism, fishing, shipping, aquaculture, and renewable ocean energy. In a constantly evolving landscape, the need for a comprehensive framework, a dashboard of sorts to holistically monitor sustainability, is evident. There is an urgent need for a practical evaluation system that balances economic growth and environmental protection across the diverse blue economy sectors. It is necessary to develop more common indicators and strengthen sector-specific sub-indicators within a comprehensive dashboard. The existing approaches, while valuable, often provide a fragmented view of sustainability, in part due to limited data availability and/or on lack of consensus on what the Blue Economy shall include.

This study aims to create a framework to assess and improve the sustainability of the Mediterranean's blue economy. It seeks to address gaps in existing sustainability assessment and envisions a flexible framework aligned with international standards, yet adaptable to the region's complexity. Developing this framework involved exhaustive research and literature review (see volume 1)¹, stakeholder engagement, and a pivotal workshop. Prioritizing inclusivity, the methodology sought diverse stakeholder input to co-design indicators and strategies essential for a flexible, relevant, and adaptable framework.

The Marseille workshop, which took place on November 23rd 2023 and during which a preliminary version of the study was presented, spotlighted critical needs, highlighting the necessity for standardized yet adaptable indicators, long-term investments in data quality, inclusive stakeholder engagement, and transparent communication strategies. The workshop's outcomes underscored the significance of integrating disparate measurement frameworks into a holistic sustainability index. It stressed the importance of open data systems, stakeholder collaboration, and inclusive methodologies capable of capturing the interconnectedness of the Mediterranean's blue economy sectors. Additionally, the discussions emphasized the need for adaptable, multi-criteria tools that can accommodate diverse perspectives and address regional nuances.

This scoping study lays a robust foundation for crafting a comprehensive framework to measure and enhance sustainability in the Mediterranean's blue economy. Its **key takeaways** include the following:

- About **30 sectoral indicators** are suggested to identify the most pertinent, meaningful, and practical sustainability metrics across various blue economy sectors. This selection process adhered to internationally recognized principles for indicator development, placing significant emphasis on ensuring a balanced representation of environmental, economic, and social dimensions.
- Moreover, efforts were made to achieve cross-sectoral consistency in indicators, where feasible, to enable seamless integration and comparability across different sectors. **More than 30 cross-cutting indicators** were provided on themes such as Circular Economy and Sustainable Sourcing.
- **A scoring system is proposed**, which serves as a comprehensive mechanism to evaluate key performance indicators (KPIs) across diverse sectors within the blue economy. Covering maritime transport, fisheries, aquaculture, offshore wind energy, and tourism, the primary goal is to provide a structured framework for quantifying the efficacy, sustainability, and impact of practices and activities within these sectors. An exploration of the possible data collection methods for each sector, further enhanced by an analysis of potential indicator relationships, is also provided.
- A refined, **priority list of seven indicators is provided**, each crucial in assessing specific dimensions of the blue economy's sustainability. They include:
 - Percentage of Sustainably Managed Fish Stocks,
 - Maritime Transport CO2 Emissions per Ton-Mile,
 - Rate of Loss of Key Coastal and Marine Habitats,
 - Number of Eco-Certified Tourism Operators,
 - Recycling Rate of Marine Plastics,
 - Jobs Created in the Blue Economy for Disadvantaged Groups,
 - Representation of Marginalized Groups in Blue Economy Governance.

¹ Plan Bleu (2023), "Scoping Study to Develop a Mediterranean Pilot on Measuring the Sustainability of the Mediterranean Blue Economy, volume 1: Literature Review and Analysis of Currently Used Indicators", November.

Further discussions with stakeholders shall finalize these indicators, ensuring a comprehensive yet focused framework/dashboard.

- The efficacy of our framework, as with any framework, crucially hinges on **resource mobilization**. European Funding Programs for Sustainable Coastal Development and Blue Economy Initiatives represent pivotal vehicles for unlocking transformative potential.
- **Harmonizing our framework with existing policies** stands as a linchpin for its integration into the regional landscape. Seamless alignment with established environmental, economic, and developmental policies is imperative. Globally, our Framework is intricately linked with the 2030 Agenda for Sustainable Development, integrating specific indicators directly or indirectly associated with Sustainable Development Goals. Regionally, the framework aligns with the Mediterranean Strategy for Sustainable Development (MSSD) 2016-2025, reinforcing Priority Objective 5 on sustainable consumption and production. Additionally, it integrates seamlessly with European Union (EU) initiatives, EU member states' sustainability efforts, and specific policies like the Circular Economy Action Plan and the EU Offshore Renewable Energy Strategy.
- An indispensable pillar supporting our framework is **active and inclusive stakeholder engagement**. The mosaic of voices—comprising local communities, industries, governmental bodies, and NGOs—holds the key to holistic and resilient solutions. By fostering collaboration and garnering diverse perspectives, we can cultivate shared ownership and commitment essential for sustainable progress. The blue economy framework should aim for continuous enhancement through robust stakeholder engagement and feedback mechanisms. Regular consultations with various stakeholders shall be maintained for input collection.
- Suggestions for **pilot studies** are provided, that could allow testing a refined indicators framework, data gathering, stakeholder collaboration, and identifying best practices. Specifically:
 - Palamós, Spain, showcases successful collaborative fisheries management, particularly in preserving the red shrimp population, with a richness of available data.
 - Similarly, the Ionian Islands, Greece, present a diverse maritime environment ideal for testing indicators related to fishing, tourism, aquaculture, maritime transport, and governance.
 - Tunisia's Zembra Marine Protected Area is a prime candidate due to its biodiversity, fishing, tourism potential, and cultural significance.
 - Nice's (France) strategic location as a bustling tourist hotspot also presents an opportunity to explore sustainable tourism practices. Furthermore, the city's commitment to coastal management and preservation initiatives forms a crucial aspect of the sustainable blue economy narrative.
 - The countries of the South East Mediterranean (Greece, Cyprus, Turkey, Egypt) also collectively show a shared commitment to sustainable development and substantial statistical capacities which bolster the viability of conducting a comprehensive, and more ambitious, assessment of sustainable blue economy indicators.
- The **suggested next steps** include a comprehensive follow-up workshop uniting stakeholders to formalize and adopt a refined indicators framework, harmonizing metrics and solidifying collective agreement. Meanwhile, launching pilot studies in strategic Mediterranean regions will empirically test the framework's adaptability and effectiveness, providing invaluable insights and data that can feed-into Plan Bleu's Observatory. Continuous stakeholder engagement, capacity-building initiatives, and strategic partnerships will sustain momentum, ensuring relevance, fostering local empowerment, and leveraging resources. These collective endeavors reaffirm Plan Bleu's commitment to cultivating a resilient, equitable, and prosperous blue economy in the Mediterranean, where the synergy between environmental sustainability and human progress fuels lasting regional prosperity.

Introduction

The term "Blue Economy" has emerged as a guiding principle for maritime and coastal development, embodying the aspiration to balance economic growth with the need for environmental sustainability and social inclusiveness (European Commission 2021b; OECD 2023). The Mediterranean region, characterized by unique ecological, economic, and social features, serves as a significant area for examining the Sustainable Blue Economy (SBE). Within this context, the Blue Economy (BE) encompasses a wide array of economic activities that are intimately linked to the sea, extending from traditional practices to innovative sectors that leverage the marine and coastal environment for sustainable prosperity.

The term, SBE, is recurrent in academic publications, policy documents, and discussions within civil society (European Commission, 2020; COA, 2019; World Bank and UN, 2017; Patil et al., 2016; WWF, 2015 & 2018; Economic Intelligence Unit, 2015; Changwon Declaration 2012; Park and Kildow, 2014). Definitions of SBE vary widely, emphasizing economic, environmental, social equity, and ecosystem components differently (UNEP, UNEP-WCMC, University of Portsmouth, Year; Ward-Paige et al., 2023).

For the scope of this study, the SBE definition provided by the SBE Visions and Pathways document (UNEP, UNEP-WCMC, University of Portsmouth) will be used. According to this source, the SBE is defined as "an approach to governing the ocean and coastal systems that facilitates the creation of equitably shared economic and social benefits, including across generations, from ocean and coastal resource use, while ensuring that the ecosystems upon which most ocean and coastal resources depend are not degraded and, where possible, are restored to a healthy functioning state" (UNEP, UNEP-WCMC, University of Portsmouth).

The Sustainable Blue Economy (SBE) encompasses various sectors such as oil and gas, fisheries, transport, and tourism, though some sectors like waste disposal, desalination, and land-based sectors with oceanic ties, such as agriculture, are less commonly considered (Park and Kildow, 2014; Voyer et al., 2018).

Understanding the complexities of the Blue Economy and the nuances of sustainability in the Mediterranean demands a comprehensive evaluation of existing methodologies, literature, and reports (UNEP, UNEP-WCMC, University of Portsmouth, Year). The literature review of volume 1 assessed the landscape of the Mediterranean Blue Economy, explored sustainability measurement methodologies, and identified areas for advancement within its various sectors.

In line with renowned frameworks and definitions, such as those put forth by the UNEP, UNEP-WCMC, and the University of Portsmouth this follow-up aims to devise a robust framework for measuring sustainability within the Mediterranean Blue Economy. It seeks to address identified gaps in monitoring, guide policy-making, governance, and ensure the fair distribution of benefits. Moreover, this framework serves not just as an assessment tool but also as a guiding beacon, steering the SBE toward a future that harmonizes economic development, ecological balance, and social well-being.

I. Gap Analysis and Review of Existing Frameworks

The analysis of the Sustainable Blue Economy Decision Support Framework alongside the systematic review conducted for the Mediterranean region revealed significant gaps in the current approach to sustainability assessment within the Blue Economy. This comprehensive analysis highlighted substantial limitations across global, EU, and Mediterranean blue economy sustainability indicators and underlying data availability.

Existing frameworks, such as the Sustainable Development Goals (SDGs) and the post-2020 global biodiversity framework by the Convention on Biological Diversity (CBD), provide foundational contexts but lack specificity concerning the Blue Economy. Similarly, sector-specific frameworks, like the FAO Code of Conduct for Responsible Fisheries, offer sustainability metrics for individual industries but fail to encompass the entire breadth of blue economy activities.

The literature review and gap analysis underscored insufficiencies in indicators, data gaps, and limitations in policy effectiveness assessment, especially concerning emerging sectors, social equity, and comprehensive measurement of ecosystem health and services.

To bridge these gaps, a multifaceted approach is essential, emphasizing expanded sustainability indicators, strengthened data collection systems, increased national and sectoral disaggregation, integrated effectiveness evaluations, and improved data standardization and comparability.

The proposed structured framework is envisioned as a comprehensive methodology designed to integrate expanded indicators, bolstered data systems, meticulous disaggregation, rigorous evaluations, and enhanced standardization. Its ultimate purpose is to create a unified and globally applicable system for assessing and improving sustainability within the Blue Economy.

II. Framework Definition

A. SCOPE

The Sustainable Blue Economy Monitoring and Evaluation (M&E) Framework is a comprehensive, integrative tool designed to guide global efforts in achieving sustainability within marine and coastal economies. It covers the full spectrum of activities—from local, small-scale operations to transboundary industrial practices—and is adaptable to diverse ecological, social, and economic contexts. The scope includes assessing impacts, managing resources sustainably, and ensuring equitable benefits while protecting and restoring ocean ecosystems.

B. OBJECTIVES

In the pursuit of a sustainable and thriving Blue Economy, this text aims to establish a cohesive and comprehensive set of criteria and indicators for the evaluation of sustainability (intended as monitoring and assessing). Recognizing the intricate nature of marine and coastal ecosystems, our objectives are multifaceted and address key aspects essential for fostering a balanced and resilient blue economy.

Objective 1: Establishing a Cohesive Evaluation Framework

Our primary goal is to provide a unified, standardized and replicable set of criteria and indicators, serving as a robust foundation for the evaluation of sustainability in the blue economy. By synthesizing existing knowledge and insights, we aim to create a comprehensive framework that considers the unique challenges and opportunities presented by marine and coastal contexts.

Objective 2: Harmonizing Monitoring Practices

To enhance the effectiveness of sustainability evaluations, we seek to harmonize existing monitoring practices with innovative approaches tailored specifically to the intricacies of marine and coastal environments. This integration will ensure a more accurate and nuanced understanding of the complex interactions within the blue economy.

Objective 3: Fostering Adaptive Management Practices

Recognizing the dynamic nature of marine ecosystems, our approach emphasizes the importance of adaptive management practices. Stakeholders must be equipped to respond effectively to changing conditions and management outcomes, promoting resilience and sustainability in the face of evolving challenges.

Objective 4: Supporting Evidence-Based Decision-Making

To guide policy development and decision-making, our framework prioritizes the generation of evidence-based, actionable data². This commitment ensures that stakeholders have access to reliable information, facilitating informed choices that align with the overarching goals of sustainability in the blue economy.

Objective 5: Facilitating Transparent Communication and Reporting

Transparent communication is fundamental to the success of sustainability initiatives. Our framework is designed to enable clear reporting of progress at multiple scales: local to global. This transparency not only fosters accountability but also enhances collective learning and collaboration.

Objective 6: Encouraging Inclusive Participation

The benefits of the blue economy should be shared equitably across all sectors of society. To achieve this, our approach emphasizes inclusive participation and ensures that diverse voices and perspectives are considered in decision-making processes. By fostering collaboration, we aim to create a sustainable blue economy that addresses the needs of communities and stakeholders from various sectors.

C. SUSTAINABILITY DIMENSIONS

It is also essential to consider a multi-dimensional approach that addresses not only environmental concerns but also economic, social, and governance aspects. The sustainability of the blue economy hinges on striking a harmonious

² Actionable data refers to information that is not only evidence-based but also practical and implementable, providing clear insights and guidance for effective decision-making and policy formulation. This emphasis on actionable data enhances the framework's capacity to drive tangible and sustainable outcomes in the pursuit of blue economy objectives

balance between these dimensions to secure the well-being of both current and future generations. This text explores the key dimensions of sustainability that underpin the success of the blue economy, each with its own set of critical factors and indicators. By delving into **environmental sustainability, economic sustainability, social sustainability, and governance**, we aim to develop a holistic understanding of the blue economy's potential and its capacity to foster responsible and enduring ocean resource management. Furthermore, by adopting measurable and adaptable indicators that align with global sustainability goals while respecting regional nuances, we can effectively track and evaluate progress in this crucial endeavor. Specifically, each dimension includes the following :

Environmental Sustainability:

- Protection, restoration, and regeneration of marine ecosystems.
- Biodiversity conservation, including the management of key biodiversity areas and species.
- Pollution reduction, including nutrient loading and plastic waste management.
- Sustainable resource use, ensuring that extraction does not exceed regeneration capacities.
- Understanding ecological interactions to enhance ecosystem resilience and promote sustainable development.

Economic Sustainability:

- Economic performance, including productivity, efficiency, and profitability of blue economy sectors.
- Job creation and stable livelihoods, with a focus on sustainable practices.
- Innovation and investment in sustainable blue economy technologies and infrastructure.
- Trade and market access for sustainable blue economy goods and services.

Social Sustainability:

- Equitable distribution of economic benefits, reducing inequality within and between communities.
- Social inclusion and the provision of equitable access to resources and benefits for all, including marginalized and indigenous populations.
- Cultural values and heritage preservation within coastal and marine regions.
- Capacity building and empowerment through education, training, and awareness programs.

Governance:

- Legal and policy frameworks that support sustainable management and conservation of ocean resources.
- Transparency and accountability in decision-making processes.
- Participation of stakeholders at all levels, from local communities to international bodies.
- Conflict resolution mechanisms to address disputes over resource use and conservation.

Each dimension is to be supported by a set of indicators that are measurable, relevant, and tailored to the specificities of the blue economy, ensuring that progress can be monitored and evaluated effectively. These indicators should align with international targets such as the SDGs and the post-2020 global biodiversity framework where appropriate, yet also allow for the inclusion of local and regional priorities. By doing so, we aspire to make sustainability in the blue economy not just achievable but also equitable and enduring. This comprehensive framework aims to strike a harmonious balance, promoting economic activities while safeguarding environmental integrity, fostering social equity, and embracing the diverse needs and aspirations of different communities. Through the integration of global benchmarks and local considerations, we seek to forge a path where the sustainability of the blue economy becomes not merely a concept, but a tangible reality that is viable, fair, and resilient.

III. Selecting Indicators for the Framework

A. SELECTING EXISTING RELEVANT INDICATORS BY THEMATIC SCOPE

The indicators listed in table 1 underwent a rigorous multi-stage selection process meticulously designed to identify the most pertinent, meaningful, and practical sustainability metrics across various blue economy sectors. This process adhered to internationally recognized principles for indicator development, placing significant emphasis on ensuring a balanced representation of environmental, economic, and social dimensions. Priority was given to indicators aligned with globally and regionally agreed sustainability goals, strategies, and frameworks to maintain coherence with established policy commitments and ongoing data collection initiatives.

Within thematic areas, specific indicators were handpicked based on their direct relevance to addressing major regional sustainability challenges. They were chosen for their capacity to illuminate critical gaps and impacts, propelling meaningful progress within the Mediterranean's blue economy. Emphasis was placed on incorporating indicators rooted in the core metrics and methodologies of leading organizations in their respective fields, ensuring credibility and maintaining consistency throughout the assessment process.

Table 1. Suggested Blue economy Indicators and framework divided by sectors

SECTOR	INDICATOR	ORIGINAL FRAMEWORK	REASON FOR SELECTION
MARITIME TRANSPORT	CO2 emissions per ton-mile	IMO Initial Strategy on GHG Reduction	Measures carbon emission intensity, crucial for decarbonization strategy
MARITIME TRANSPORT	Proportion of vessels using alternative fuels	Getting to Zero Coalition strategy	Signals transition to cleaner energy sources
MARITIME TRANSPORT	Spills and discharges per ship mile (gallon/mile)	HELCOM, OSPAR, and Barcelona Conventions	Quantifies pollution impact on marine ecosystems
MARITIME TRANSPORT	Percentage of fleet implementing ballast water treatment	IMO Ballast Water Management Convention	Reduces potential spread of invasive species
MARITIME TRANSPORT	Lost containers per distance transported	World Bank Logistics Performance Index	Measures safety and reduces plastic pollution
MARITIME TRANSPORT	Seafarer rights violations	ILO Maritime Labour Convention	Ensures decent work standards and labor rights
FISHERIES	Percentage of catch from sustainably managed fisheries	FAO Code of Conduct for Responsible Fisheries	Measures sustainability and responsible harvesting, crucial for ecosystem health and livelihoods
FISHERIES	Fuel efficiency per ton of catch	Tyedmers et al. 2005	Indicates emission decoupling and technological upgrades, reducing environmental impact
FISHERIES	Rates of bycatch and discards	UN FAO SOFIA sustainability assessment	Quantifies impact on non-target species and ecosystem health, promotes conservation
FISHERIES	Extent of critical fish habitats protected or restored	MSC Fisheries Certification	Safeguards vulnerable ecosystems through spatial management, supporting biodiversity
FISHERIES	Fisheries management effectiveness	European Commission Blue Economy Report	Captures the quality and enforcement of regulatory frameworks, ensures sustainability

FISHERIES	Labor rights violations and injuries	UN SDG indicator 8.8.1	Ensures protection of human rights and safe working conditions, aligns with SDGs
AQUACULTURE	Extent of total suitable area under sustainable mariculture practices	UN FAO Blue Growth Initiative	Shows the spatial scale of sustainable operations, essential for industry growth and resource conservation
AQUACULTURE	Aquaculture productivity improvements ³	ASC Aquaculture Stewardship Certification	Increases efficiency, reduces environmental pressures, and supports resource conservation
AQUACULTURE	Escapee rates	NOAA aquaculture policy	Monitors potential invasive species risks, safeguards ecosystems
AQUACULTURE	Disease outbreak frequency	EU Aquaculture Sustainability Framework	Signals health and welfare standards, essential for sustainable aquaculture
AQUACULTURE	Antibiotics usage rates	ASC Aquaculture Stewardship Certification	Addresses antimicrobial resistance issues, protects human and environmental health
AQUACULTURE	Employment equity and safety	ILO Work in Fishing Convention C188	Ensures decent work standards and inclusion, promoting social sustainability
OFFSHORE WIND ENERGY	Levelized cost of energy (USD/kWh)	IRENA renewable costing methodology	Measures affordability and competitiveness with conventional sources
OFFSHORE WIND ENERGY	Capacity factors	EU Offshore Renewable Energy Strategy	Indicates technological performance and reliability
OFFSHORE WIND ENERGY	Jobs created per MW installed	UK Offshore Wind Sector Deal	Quantifies employment and economic benefits
OFFSHORE WIND ENERGY	Sea space allocated for development (km ²)	EU Maritime Spatial Planning Directive	Planning for sustainable and efficient spatial use
OFFSHORE WIND ENERGY	Rate of wildlife collisions	UN Environment EIA guidelines	Monitors and minimizes harm to biodiversity
OFFSHORE WIND ENERGY	Decommissioning funds assured per installed capacity	OSPAR Convention	Ensures full lifecycle responsibility
TOURISM	Tourism revenue compared to environmental protection spend	UNEP Blue Economy scoping study	Balances economic benefits with conservation financing
TOURISM	Number of eco-certified operators	Global Sustainable Tourism Council criteria	Signals uptake of sustainability practices

³ Productivity improvements in aquaculture are typically measured in terms of the output or yield of the aquaculture system per unit input. The specific unit of measurement can vary based on what is being produced (e.g., weight of harvested fish, number of individuals, etc.) and the inputs considered (e.g., feed, water, energy). A few common units associated with aquaculture productivity could be:

Weight of Harvested Fish per Unit Area:

- Unit: Kilograms per hectare (kg/ha) or pounds per acre.

Number of Individuals (Fish, Shrimp, etc.) per Unit Volume:

- Unit: Individuals per cubic meter (ind/m³) or per liter.

Feed Conversion Ratio (FCR):

- Unit: The ratio of the weight of feed consumed to the weight gain of the aquaculture product (no unit).

Survival Rate:

- Unit: Percentage (%).

Production Index:

- Unit: A composite index that considers various factors like growth rate, survival, and feed conversion.

TOURISM	Tourist arrivals during peak periods	UNWTO carrying capacity guidelines	Manages congestion pressures on destinations
TOURISM	Extent of marine area under protection	Convention on Biological Diversity Aichi Target 11	Safeguards biodiversity from tourism impacts
TOURISM	Solid waste management at coastal destinations	UN Environment marine litter strategy	Mitigates tourism's waste burden on coastal ecosystems
TOURISM	Local employment and procurement	UNWTO indicators of sustainable development for tourism destinations	Enhances tourism's local economic linkages

Source: Authors compilation

Feasibility was a key criterion in the selection process, evaluating the availability of necessary data sources and the capacity for effective data collection. Moreover, efforts were made to achieve cross-sectoral consistency in indicators, where feasible, to enable seamless integration and comparability across different sectors (Table 2).

We have contemplated the integration of Marine Protected Areas (MPAs) within the cross-cutting themes (Circular Economy, Sustainable Sourcing, etc.), which we can discuss with stakeholders. Exploring their potential alignment with the overarching goals of the sustainable blue economy framework will underline the broader relevance of MPAs. Emphasizing the multi-sector impact of MPAs can spotlight their significant contribution to fostering sustainable practices across diverse domains.

Table 2. Suggested Blue economy Indicators and framework in the cross-cutting themes

SECTOR	INDICATOR	ORIGINAL FRAMEWORK	REASON FOR SELECTION
CIRCULAR ECONOMY METRICS	Recycling rate of marine plastics	EU Circular Economy Framework	Measures transition to circular material flows
CIRCULAR ECONOMY METRICS	Water reuse and recycling rates ⁴	Ellen MacArthur Foundation circular indicators	Maximizes water efficiency and security
CIRCULAR ECONOMY METRICS	Food loss and waste reduction	UN SDG 12.3	Addresses systemic food wastage and supports food security
CIRCULAR ECONOMY METRICS	Lifespan of durable goods	European Commission product policy roadmap	Extends product lifespan and optimizes resources
CIRCULAR ECONOMY METRICS	Industrial symbiosis synergies	World Economic Forum circular indicators	Unlocks collaborative opportunities and mutual benefits
CIRCULAR ECONOMY METRICS	Adoption of circular design and production principles	OECD sustainable manufacturing indicators	Embeds circularity from product design stage
SUSTAINABLE SOURCING AND SUPPLY CHAIN	Share of certified sustainable seafood	IFFO RS and MSC certification schemes	Drives uptake of 3rd party sustainability verification

⁴ The water reuse and recycling rate indicator has been chosen in consideration of the imperative to foster sustainable water resource management. This decision is rooted in the acknowledgment of the importance of reusing treated wastewater, aligning with core principles such as water conservation, environmental stewardship, and the efficient utilization of available water resources. The indicator encompasses diverse sources, encompassing wastewater from industrial, residential, and agricultural sectors. This inclusivity ensures a comprehensive approach to water sustainability.

Furthermore, the deliberate inclusion of non-conventional sources underscores a commitment to adopting a circular perspective. By embracing treated effluents from desalination, produced water from industrial operations, and treating brackish water, the indicator exemplifies a holistic strategy. This approach aims to advance water management within the framework of a blue economy, emphasizing not only the conservation of water resources but also the responsible and integrated utilization of diverse water sources.

In essence, the selection of this indicator signifies a dedication to maximizing the utility of water resources while concurrently minimizing environmental impact. It contributes to the overarching goal of fortifying long-term water resilience and fostering a paradigm of sustainable and circular water resource management.

SUSTAINABLE SOURCING AND SUPPLY CHAIN	Renewable energy share in processing and transport	CDP supply chain reporting methodology	Measures energy transition in downstream activities
SUSTAINABLE SOURCING AND SUPPLY CHAIN	Rate of illegal, unregulated, and unreported fishing	FAO International Plan of Action	Addresses unsustainable practices undermining legal operators
SUSTAINABLE SOURCING AND SUPPLY CHAIN	Labor standards in processing facilities	Global Reporting Initiative	Ensures socially responsible business practices
SUSTAINABLE SOURCING AND SUPPLY CHAIN	Product traceability scores	UN FAO Voluntary Guidelines for Catch Documentation	Promotes transparency and accountability
SUSTAINABLE SOURCING AND SUPPLY CHAIN	Procurement policies integrating sustainability criteria	OECD sustainable public procurement guidelines	Mainstreams sustainability considerations in purchasing
SOCIAL IMPACT ASSESSMENT INDICATORS	Employment generated for marginalized groups	European Commission social sustainability framework	Promotes inclusive growth opportunities
SOCIAL IMPACT ASSESSMENT INDICATORS	User conflicts addressed through co-management	FAO SSF Guidelines for equitable tenure rights	Balances interests through participation and empowerment
SOCIAL IMPACT ASSESSMENT INDICATORS	Distributional equity of marine resource access	UN Environment marine & coastal access equity framework	Guards against marginalization in resource allocation
SOCIAL IMPACT ASSESSMENT INDICATORS	Marine area returned to indigenous management	IUCN governance analysis methodology	Recognizes traditional knowledge and governance systems
SOCIAL IMPACT ASSESSMENT INDICATORS	Cultural impacts assessed and minimized	IFC Performance Standard 8 on cultural heritage	Respects cultural values, identities and heritage
SOCIAL IMPACT ASSESSMENT INDICATORS	Work conditions in the informal economy	ILO decent work metrics	Extends protections and opportunities to vulnerable workers
INCLUSIVE GOVERNANCE FOR BLUE ECONOMY	Representation of marginalized groups	UNDP governance indicators handbook	Ensures participation and empowerment of disadvantaged stakeholders
INCLUSIVE GOVERNANCE FOR BLUE ECONOMY	Information transparency	OECD Principles on Water Governance	Enables accountability through access to information
INCLUSIVE GOVERNANCE FOR BLUE ECONOMY	Multi-sector coordination mechanisms adopted	UN SDG indicator 17.14.1	Drives coherent and integrated policymaking
INCLUSIVE GOVERNANCE FOR BLUE ECONOMY	Public participation in decision-making	Aarhus Convention provisions on public participation	Provides meaningful channels for stakeholder engagement

INCLUSIVE GOVERNANCE FOR BLUE ECONOMY	Integrated coastal zone management plans implemented	European Commission ICZM recommendations	Adopts integrated planning frameworks across sectors
INCLUSIVE GOVERNANCE FOR BLUE ECONOMY	Benefit-sharing mechanisms adopted	CBD Nagoya Protocol on Access and Benefit-Sharing	Promotes equitable benefit distribution from genetic resources
BLUE CARBON ASSESSMENT	Area of blue carbon ecosystems mapped and protected	IUCN blue carbon ecosystem guidelines	Quantifies and conserves carbon sequestration habitats
BLUE CARBON ASSESSMENT	Carbon sequestration potential by habitat	Intergovernmental Oceanographic Commission blue carbon monitoring guidelines	Highlights mitigation value to incentivize protection
BLUE CARBON ASSESSMENT	Emission avoidance from protected blue carbon ecosystems	UN Environment Coastal Blue Carbon Manual	Demonstrates quantifiable mitigation outcomes
BLUE CARBON ASSESSMENT	Loss rate of blue carbon ecosystems	UN Environment Coastal Blue Carbon Manual	Monitors extent of ecosystem loss over time
BLUE CARBON ASSESSMENT	Blue carbon integration in NDCs and national policies	UNFCCC technical guidelines for NDCs	Mainstreams blue carbon into mitigation policy frameworks
BLUE CARBON ASSESSMENT	Public and private investment in blue carbon initiatives	Seychelles debt swap for marine conservation and climate adaptation	Mobilizes new finance streams for blue carbon
BLUE FINANCIAL FLOWS	Blue economy share of ocean-based GDP	OECD Ocean Economy Database	Measures scale of activity and growth of emerging sectors
BLUE FINANCIAL FLOWS	Growth rate of debt financing for sustainable marine projects	World Bank blue bonds methodology	Tracks financial innovation unlocking new capital pools
BLUE FINANCIAL FLOWS	Philanthropic grants for marine conservation and sustainable use	OECD philanthropy metrics	Signals increasing priority of oceans among donors
BLUE FINANCIAL FLOWS	Blended finance facilities for ocean-related SDGs	European Commission blueInvest platform	Combines public and philanthropic funds to catalyze private investment
BLUE FINANCIAL FLOWS	Insurance products for coastal resilience and adaptation	ICLEI Adaptation Finance guidelines	Boosts climate risk transfer markets serving vulnerable communities
BLUE FINANCIAL FLOWS	Disclosure of ocean-related risks by banks and investors	Task Force on Climate-related Financial Disclosures	Improves risk assessment, pricing, and mitigation strategies

Source: Authors compilation

B. THE NEED FOR ALSO INCLUDING NEW INDICATORS

The existing set of indicators, while comprehensive, might not always align perfectly with the objectives of assessing sustainability within the Mediterranean Blue Economy. Some indicators may lack specificity, measurability, or might not be entirely aligned with the goal of being Specific, Measurable, Achievable, Relevant, and Time-bound (SMART).

Challenges with Current Indicators include:

- **Specificity:** Certain indicators may lack specificity to the Mediterranean context or fail to capture the region's unique socio-economic and environmental intricacies.

- **Measurability:** Some indicators might lack clear metrics or standardized methodologies for measurement, hindering accurate and consistent data collection.
- **Relevance:** The relevance of existing indicators might diminish over time due to evolving economic, environmental, and social landscapes.
- **Timeliness:** Indicators might not reflect real-time changes or might have a time lag in reflecting the impacts of policies or initiatives.

To address these challenges, we consider it is imperative to consider the development of new original indicators that are more attuned to the specificities of the Mediterranean region. These indicators should aim to be SMART: Specific, Measurable, Achievable, Relevant, and Time-bound, ensuring their effectiveness in assessing the sustainability of the Blue Economy accurately. During the Marseille workshop, discussions and brainstorming sessions were facilitated and focused on identifying potential gaps in existing indicators and exploring avenues for the development of new, more tailored indicators. Stakeholders' insights and expertise were pivotal in identifying the essential parameters that should be considered in formulating these new indicators.

Among the indicators that were proposed during the workshop to assess the sustainability of specific sectors one finds :

- Fishing: Share of labeled landed fish quantity, Rate of increase in direct sales at markets and fish auctions.
- Sustainable tourism and leisure: Number of equipped mooring zones to prevent anchoring, Number of marinas certified as 'Clean Ports' by the European Union.
- Renewable marine energies: Rate of development of shared connections for commercial parks, Rate of experimentation of co-activities within these parks, such as fishing or aquaculture.
- Aquaculture: Feed conversion ratio per unit of aquaculture production; Pollution discharge rate into the ecosystem; Proportion of use of fuels and renewable energies during production; Percentage of juveniles, as this indicator defines the resilience of the activity; Composition of aquaculture feed (fish/seaweed to feed fish); Circularity rate, which is the biomass conversion rate (e.g., collagen production from fish) and the rate of valorization of secondary products (peptides, medicines, etc.).
- Cross-sectional: Coastal seabed artificialization.

In addition, it was recognized during the workshop that there is **a pressing need to develop specific indicators that measure gender dimensions** and the inclusion of women in the Mediterranean Blue Economy sectors. This goes beyond merely collecting quantitative data; it involves identifying robust and relevant data to assess the meaningful inclusion of women in the workforce related to the blue economy. In addressing this aspect, it is crucial to consider qualitative factors such as skills, access to opportunities, and the promotion of green jobs. Developing a comprehensive understanding of the role and status of women in the blue economy requires a nuanced approach that considers both quantitative metrics and qualitative dimensions. By incorporating gender-specific indicators into the assessment framework, we can shed light on the unique challenges and opportunities faced by women in the Mediterranean Blue Economy, promoting gender equality and fostering a more inclusive and sustainable maritime sector.

IV. Scoring System - Enhanced Framework for Blue Economy Sustainability Evaluation

A suggested scoring system is applied to the list of indicators that we identified in section 5 (Tables 1 and 2) and can serve as a comprehensive mechanism to evaluate key performance indicators (KPIs) across diverse sectors within the blue economy. Covering maritime transport, fisheries, aquaculture, offshore wind energy, and tourism, the primary goal is to provide a structured framework for quantifying the efficacy, sustainability, and impact of practices and activities within these sectors.

The broader intention of this scoring system is to synthesize these scores into a cohesive Blue Economy Sustainability Growth or Index (BESG/Index). The primary objective is to synthesize a composite measure that encapsulates the collective sustainability performance across multiple sectors, akin to comprehensive indices such as the Ocean Health Index (OHI). Specifically:

- The assigned scores to individual indicators act as foundational elements for a unified BESG/Index. These scores, potentially weighted, can be synthesized to create an overarching measure aiming to encapsulate diverse sustainability facets across the Mediterranean's blue economy sectors.
- The scoring system intends to provide not just a collection of disparate scores but a unified, comparable metric (1 to 10)⁵. This consolidated metric becomes a valuable tool for policymakers, stakeholders, and researchers, allowing comparative analyses of sustainability over time or across regions.
- The BESG/Index is user-friendly and caters to a wide audience, from policymakers and industry stakeholders to environmental organizations, research institutions, and the general public.
- Similar to the Ocean Health Index, the BESG/Index aims to furnish a numerical value that enables easy comparison and benchmarking.
- The scoring system synthesizes data from diverse sectors, unifying different measurement units, and potentially standardizing scores to establish a unified assessment framework.
- Similar to the iterative process of the Ocean Health Index, the BESG/Index would necessitate continuous refinement, adaptation, and integration of feedback. Periodic revisions and updates ensure its relevance and accuracy amidst evolving scientific knowledge and changing environmental dynamics. Determining weights for different indicators or sectors based on their significance will be key, to ensure a balanced representation of various factors contributing to the blue economy's sustainability.

The envisioned BESG/Index aims to condense complex sustainability data into an understandable and actionable metric. It intends to promote a deeper comprehension of the Mediterranean blue economy's overall health and its strides towards sustainability. Below is the suggested scoring system and suggested KPIs for each thematic and cross-cutting Blue Economy indicator that was proposed.

⁵ The choice of a 1 to 10 scale is driven by the need for adaptability to diverse indicators within different sectors. This scale allows for a nuanced representation that can be tailored to the specific characteristics of each indicator. Unlike rigid thresholds, a numerical scale provides flexibility, accommodating the variability inherent in different sustainability metrics.

The intention is not to impose fixed boundaries but to offer a continuum where values can be assigned based on the unique attributes of each indicator. This approach recognizes the dynamic nature of sustainability criteria and the necessity to customize metric scales accordingly. In essence, the 1 to 10 scale serves as a flexible tool that can be molded to fit the intricacies of various indicators, ensuring a more nuanced and adaptable assessment process. It enables a responsive methodology that aligns with the diverse nature of sustainability measures across different sectors.

Box 1. Suggested Scoring system and KPIs per Indicator - Sectoral

1. Maritime transport

- **CO2 emissions per ton-mile:**
 - Score from 1 (high emissions, not in compliance with regional targets) to 10 (low emissions, fully compliant with regional targets).
 - KPI: Compliance with regional CO2 reduction targets.
- **Proportion of vessels using alternative fuels:**
 - Score from 1 (low adoption, no use of alternative fuels) to 10 (high adoption, majority of vessels using alternative fuels).
 - KPI: Percentage of vessels using alternative fuels.
- **Spills and discharges per ship mile:**
 - Score from 1 (high pollution, frequent spills, and discharges) to 10 (low pollution, minimal spills, and discharges).
 - KPI: Frequency and volume of spills and discharges per ship mile.
- **Percentage of fleet implementing ballast water treatment:**
 - Score from 1 (low implementation, minimal treatment) to 10 (high implementation, comprehensive ballast water treatment).
 - KPI: Percentage of the fleet implementing ballast water treatment.
- **Lost containers per distance transported:**
 - Score from 1 (high loss, frequent container losses) to 10 (low loss, minimal container losses).
 - KPI: Frequency of lost containers per distance transported.
- **Seafarer rights violations:**
 - Score from 1 (high violations, poor seafarer rights protection) to 10 (low violations, strong seafarer rights protection).
 - KPI: Incidents of seafarer rights violations.

2. Fisheries

- **Percentage of catch from sustainably managed fisheries:**
 - Score from 1 (low sustainability, minimal sustainable management) to 10 (high sustainability, strong sustainable management).
 - KPI: Percentage of catch from sustainably managed fisheries in the Mediterranean.
- **Fuel efficiency per ton of catch:**
 - Score from 1 (low efficiency, high fuel consumption) to 10 (high efficiency, low fuel consumption).
 - KPI: Fuel consumption per ton of catch.
- **Rates of bycatch and discards:**
 - Score from 1 (high bycatch and discards, significant waste) to 10 (low bycatch and discards, minimal waste).
 - KPI: Rates of bycatch and discards as a percentage of total catch.
- **Extent of critical fish habitats protected or restored:**
 - Score from 1 (low protection/restoration, minimal conservation efforts) to 10 (high protection/restoration, extensive conservation efforts).
 - KPI: Area of critical fish habitats protected or restored in the Mediterranean.
- **Fisheries management effectiveness:**
 - Score from 1 (ineffective management, poor adherence to regulations) to 10 (effective management, strong regulatory adherence).
 - KPI: Effectiveness of fisheries management in the Mediterranean.

- **Labor rights violations and injuries:**
 - Score from 1 (high violations/injuries, poor labor rights protection) to 10 (low violations/injuries, strong labor rights protection).
 - KPI: Incidents of labor rights violations and injuries in the fishing industry.

3. Aquaculture

- **Extent of total suitable area under sustainable mariculture practices:**
 - Score from 1 (low sustainability, minimal sustainable practices) to 10 (high sustainability, extensive sustainable practices).
 - KPI: Total suitable area under sustainable mariculture practices in the Mediterranean.
- **Aquaculture productivity improvements:**
 - Score from 1 (low productivity, minimal improvements) to 10 (high productivity, significant improvements).
 - KPI: Aquaculture productivity and improvements.
- **Escapee Resilience Index (ERI):**
 - A novel indicator designed to holistically evaluate escapee rates from aquaculture facilities in the Mediterranean, with a scale ranging from 1 to 10.
 - KPI: ERI takes into account the specific time periods for assessment, distinguishing between normal environmental conditions during standard production system operations and periods affected by adverse weather conditions such as floods or submersions. By integrating variables associated with both scenarios, ERI provides a comprehensive and dynamic measurement. A lower score signifies higher escapee rates and greater vulnerability during challenging conditions, while a higher score indicates lower escapee rates and enhanced resilience in the face of environmental fluctuations.
- **Disease outbreak frequency⁶:**
 - Score from 1 (high frequency, frequent disease outbreaks) to 10 (low frequency, minimal disease outbreaks).
 - KPI: Frequency of disease outbreaks in Mediterranean aquaculture.
- **Antibiotics usage rates:**
 - Score from 1 (high usage, excessive antibiotic use) to 10 (low usage, responsible antibiotic use).
 - KPI: Antibiotic usage rates in Mediterranean aquaculture.
- **Employment equity and safety:**
 - Score from 1 (low equity/safety, poor labor standards) to 10 (high equity/safety, strong labor standards).
 - KPI: Labor rights, equity, and safety in Mediterranean aquaculture.

4. Offshore Wind Energy

- **Levelized cost of energy:**
 - Score from 1 (high cost, uncompetitive energy pricing) to 10 (low cost, competitive energy pricing).
 - KPI: Levelized cost of offshore wind energy in the Mediterranean.
- **Capacity factors:**
 - Score from 1 (low-capacity factor, poor energy generation) to 10 (high-capacity factor, efficient energy generation).
 - KPI: Capacity factors of offshore wind energy installations in the Mediterranean.

⁶ The indicator "Frequency of disease outbreaks in Mediterranean aquaculture" typically refers to infectious diseases caused by pathogens such as bacteria, viruses, parasites, and fungi. This does not encompass genetic diseases or physiological disorders. Precise disease outbreak types within this context would include bacterial diseases like *Vibrio* spp. infections, *Aeromonas* spp. infections, and *Streptococcus*. Viral diseases such as Viral Nervous Necrosis (VNN), Infectious Pancreatic Necrosis (IPN), and Viral Hemorrhagic Septicemia (VHS) are also common. Parasitic infections involve issues like sea lice infestations and protozoan diseases. Additionally, fungal infections from various pathogens and environmental stress-related problems like poor water quality and temperature fluctuations contribute to disease outbreaks.

- **Jobs created per MW installed:**
 - Score from 1 (low job creation, minimal employment generation) to 10 (high job creation, significant employment generation).
 - KPI: Jobs created per MW installed in the Mediterranean offshore wind sector.
- **Sea space allocated for development:**
 - Score from 1 (low allocation, limited space for development) to 10 (high allocation, ample space for development).
 - KPI: Sea space allocated for offshore wind energy development in the Mediterranean.
- **Rate of wildlife collisions:**
 - Score from 1 (high collisions, significant harm to wildlife) to 10 (low collisions, minimal harm to wildlife).
 - KPI: Rate of wildlife collisions associated with offshore wind energy in the Mediterranean.
- **Decommissioning funds assured per installed capacity:**
 - Score from 1 (low assurance, inadequate decommissioning funds) to 10 (high assurance, sufficient decommissioning funds).
 - KPI: Assurance of decommissioning funds per installed offshore wind energy capacity in the Mediterranean.

5. Tourism

- **Tourism revenue compared to environmental protection spend:**
 - Score from 1 (low balance, inadequate investment in protection) to 10 (high balance, substantial investment in protection).
 - KPI: Comparison of tourism revenue to spending on environmental protection in the Mediterranean.
- **Number of eco-certified operators:**
 - Score from 1 (low certification, few eco-certified operators) to 10 (high certification, many eco-certified operators).
 - KPI: Number of eco-certified tourism operators in the Mediterranean.
- **Tourist arrivals during peak periods:**
 - Score from 1 (high arrivals, overcrowding during peaks) to 10 (low arrivals, manageable peak periods).
 - KPI: Tourist arrivals during peak seasons in the Mediterranean.
- **Extent of marine area under protection:**
 - Score from 1 (low protection, minimal marine protection) to 10 (high protection, extensive marine protection).
 - KPI: Extent of marine areas under protection in the Mediterranean.
- **Solid waste management at coastal destinations:**
 - Score from 1 (ineffective waste management, poor waste handling) to 10 (effective waste management, proper waste handling).
 - KPI: Quality of solid waste management at coastal destinations in the Mediterranean.
- **Local employment and procurement:**
 - Score from 1 (low local engagement, limited local employment and procurement) to 10 (high local engagement, significant local employment and procurement).
 - KPI: Level of local employment and procurement in the Mediterranean tourism industry.

Box 2. Suggested Scoring system and KPIs per Indicator - Sectoral Cross-cutting Themes

1. Circular Economy Metrics

- **Recycling rate of marine plastics:**
 - Score from 1 (low recycling rate, minimal circularity) to 10 (high recycling rate, strong circularity).
 - KPI: Percentage of marine plastics recycled.
- **Water reuse and recycling rates:**
 - Score from 1 (low water reuse/recycling, inefficiency) to 10 (high water reuse/recycling, efficiency).
 - KPI: Percentage of water reused and recycled.
- **Food loss and waste reduction:**
 - Score from 1 (high food loss/waste, insufficient reduction) to 10 (low food loss/waste, significant reduction).
 - KPI: Reduction in food loss and waste as per SDG 12.3.
- **Lifespan of durable goods:**
 - Score from 1 (short lifespan, wasteful) to 10 (long lifespan, resource optimization).
 - KPI: Average lifespan of durable goods.
- **Industrial symbiosis synergies:**
 - Score from 1 (low synergies, limited collaboration) to 10 (high synergies, strong collaboration).
 - KPI: Number of industrial symbiosis partnerships.
- **Adoption of circular design and production principles:**
 - Score from 1 (low adoption, minimal circular design) to 10 (high adoption, strong circular design).
 - KPI: Integration of circular design principles in production.

2. Sustainable Sourcing and Supply Chain

- **Share of certified sustainable seafood:**
 - Score from 1 (low share, limited sustainability) to 10 (high share, extensive sustainability).
 - KPI: Percentage of certified sustainable seafood in the supply chain.
- **Renewable energy share in processing and transport:**
 - Score from 1 (low renewable energy share, limited sustainability) to 10 (high renewable energy share, strong sustainability).
 - KPI: Percentage of renewable energy used in processing and transport.
- **Rate of illegal, unregulated, and unreported fishing:**
 - Score from 1 (high rate, significant IUU fishing) to 10 (low rate, minimal IUU fishing).
 - KPI: Rate of illegal, unregulated, and unreported fishing incidents.
- **Labor standards in processing facilities:**
 - Score from 1 (low standards, poor labor conditions) to 10 (high standards, strong labor conditions).
 - KPI: Compliance with labor standards in processing facilities.
- **Product traceability scores:**
 - Score from 1 (low traceability, limited transparency) to 10 (high traceability, strong transparency).
 - KPI: Product traceability scores indicating transparency.
- **Procurement policies integrating sustainability criteria:**
 - Score from 1 (low integration, minimal sustainability criteria) to 10 (high integration, strong sustainability criteria).
 - KPI: Integration of sustainability criteria in procurement policies.

3. Social Impact Assessment Indicators

- **Employment generated for marginalized groups:**
 - Score from 1 (low employment generation, limited inclusion) to 10 (high employment generation, strong inclusion).
 - KPI: Employment opportunities for marginalized groups.
- **User conflicts addressed through co-management:**
 - Score from 1 (low conflicts addressed, limited co-management) to 10 (high conflicts addressed, strong co-management).
 - KPI: Successful resolution of user conflicts through co-management.
- **Distributional equity of marine resource access:**
 - Score from 1 (low equity, inequitable access) to 10 (high equity, equitable access).
 - KPI: Distributional equity of access to marine resources.
- **Marine area returned to indigenous management:**
 - Score from 1 (low return, limited indigenous management) to 10 (high return, strong indigenous management).
 - KPI: Marine areas under indigenous management.
- **Cultural impacts assessed and minimized:**
 - Score from 1 (low assessment/minimization, cultural impact) to 10 (high assessment/minimization, minimal cultural impact).
 - KPI: Cultural impact assessment and mitigation.
- **Work conditions in the informal economy:**
 - Score from 1 (poor conditions, inadequate protections) to 10 (good conditions, strong protections).
 - KPI: Work conditions in the informal economy.

4. Inclusive Governance for Blue Economy

- **Representation of marginalized groups:**
 - Score from 1 (low representation, minimal inclusion) to 10 (high representation, strong inclusion).
 - KPI: Representation of marginalized groups in governance.
- **Information transparency:**
 - Score from 1 (low transparency, limited information access) to 10 (high transparency, strong information access).
 - KPI: Information transparency in governance.
- **Multi-sector coordination mechanisms adopted:**
 - Score from 1 (low adoption, limited coordination) to 10 (high adoption, strong coordination).
 - KPI: Adoption of multi-sector coordination mechanisms.
- **Public participation in decision-making:**
 - Score from 1 (low participation, limited engagement) to 10 (high participation, strong engagement).
 - KPI: Level of public participation in decision-making.
- **Integrated coastal zone management plans implemented:**
 - Score from 1 (low implementation, minimal integration) to 10 (high implementation, strong integration).
 - KPI: Implementation of integrated coastal zone management plans.
- **Benefit-sharing mechanisms adopted:**
 - Score from 1 (low adoption, minimal benefit-sharing) to 10 (high adoption, strong benefit-sharing).
 - KPI: Adoption of benefit-sharing mechanisms.

5. Blue Carbon Assessment

- **Area of blue carbon ecosystems mapped and protected:**
 - Score from 1 (low mapping/protection, limited conservation) to 10 (high mapping/protection, strong conservation).
 - KPI: Area of mapped and protected blue carbon ecosystems.
- **Carbon sequestration potential by habitat:**
 - Score from 1 (low potential, limited sequestration) to 10 (high potential, strong sequestration).
 - KPI: Carbon sequestration potential by habitat.
- **Emission avoidance from protected blue carbon ecosystems:**
 - Score from 1 (low avoidance, limited emissions reduction) to 10 (high avoidance, strong emissions reduction).
 - KPI: Emission avoidance from protected blue carbon ecosystems.
- **Loss rate of blue carbon ecosystems:**
 - Score from 1 (high loss rate, significant ecosystem loss) to 10 (low loss rate, minimal ecosystem loss).
 - KPI: Rate of loss of blue carbon ecosystems.
- **Blue carbon integration in NDCs and national policies:**
 - Score from 1 (low integration, limited policy alignment) to 10 (high integration, strong policy alignment).
 - KPI: Integration of blue carbon in Nationally Determined Contributions (NDCs) and national policies.
- **Public and private investment in blue carbon initiatives:**
 - Score from 1 (low investment, limited financial support) to 10 (high investment, strong financial support).
 - KPI: Public and private investment in blue carbon initiatives.

6. Blue Financial Flows

- **Blue economy share of ocean-based GDP:**
 - Score from 1 (low share, limited contribution) to 10 (high share, significant contribution).
 - KPI: Blue economy's contribution to the ocean-based GDP.
- **Growth rate of debt financing for sustainable marine projects:**
 - Score from 1 (low growth, limited financing) to 10 (high growth, significant financing).
 - KPI: Growth rate of debt financing for sustainable marine projects.
- **Philanthropic grants for marine conservation and sustainable use:**
 - Score from 1 (low grants, limited support) to 10 (high grants, significant support).
 - KPI: Philanthropic grants for marine conservation and sustainable use.
- **Blended finance facilities for ocean-related SDGs:**
 - Score from 1 (low facilities, limited blended finance) to 10 (high facilities, significant blended finance).
 - KPI: Availability of blended finance facilities for ocean-related SDGs.
- **Insurance products for coastal resilience and adaptation:**
 - Score from 1 (low insurance products, limited resilience) to 10 (high insurance products, strong resilience).
 - KPI: Availability of insurance products for coastal resilience and adaptation.
- **Disclosure of ocean-related risks by banks and investors:**
 - Score from 1 (low disclosure, limited risk awareness) to 10 (high disclosure, strong risk awareness).
 - KPI: Disclosure of ocean-related risks by banks and investors.

V. Data Collection Methods: Enhancing Indicator Relationships

Data collection for evaluating sustainability across various blue economy sectors should involve a diverse array of sources and approaches. Below is an exploration of the possible data collection methods for each sector, further enhanced by an analysis of potential indicator relationships (also synthesized in table 3):

- **Maritime Transport:** Understanding the dynamics of Maritime Transport involves a meticulous approach. To acquire data, tapping into ship monitoring systems, emissions tracking mechanisms, and labor assessments would be needed. These methods would furnish us with crucial insights into metrics like CO₂ emissions per ton-mile, adoption rates of alternative fuels, and even aspects related to seafarer rights violations. Diverse sources such as the International Maritime Organization or national maritime authorities would provide the necessary data. By establishing connections between CO₂ emissions in Maritime Transport and energy costs in Offshore Wind Energy, we can illustrate how eco-conscious maritime practices could directly influence overall expenses and sustainability in energy. Of course, accessing comprehensive data from ship monitoring systems and emissions tracking might be hindered by the lack of uniform reporting standards or reluctance in sharing proprietary data. Meanwhile, obtaining accurate labor-related data could face resistance due to privacy concerns or limited cooperation from involved parties. This is why continuously advocating for standardized reporting protocols among shipping companies to ensure uniformity and accessibility of data is crucial.
- **Fisheries:** The intricate web of data in Fisheries necessitates a detailed approach. Here, one would need to engage in fisheries monitoring, documentation of catches, and rigorous labor inspections. Such methods would illuminate aspects such as sustainable catch rates, fuel efficiency in fishing practices, bycatch data, and labor rights within the industry. Critical sources like the Food and Agriculture Organization and industry certifications serve as pivotal repositories of such information. Exploring the connections between sustainable catch in Fisheries and practices in Aquaculture enables us to identify areas of alignment or divergence in our sustainability efforts across these sectors. Naturally, ensuring consistency in data collection across diverse fishing practices and regions might pose challenges, affecting the reliability of gathered information. Providing training programs to ensure consistency in data collection methodologies across fisheries, emphasizing compliance with standardized reporting practices, could provide useful insights.
- **Aquaculture:** Within Aquaculture, the data collection methodology could revolve around accessing records, conducting inspections, and rigorously assessing labor conditions. These approaches would yield valuable insights into sustainable practices, productivity measures, occurrences of disease outbreaks, and prevailing labor conditions within aquaculture settings. Key sources such as the Aquaculture Stewardship Council and national aquaculture authorities play a crucial role in providing this information. Understanding the intricate relationships between sustainable practices in Aquaculture and the sustainability of catch in Fisheries provides a comprehensive picture of how these sectors influence each other.
- **Offshore Wind Energy:** Comprehensively grasping the dynamics of Offshore Wind Energy involves delving into various data streams. Possible methods would encompass analysis of energy records, conducting environmental assessments, and closely examining financial disclosures. These avenues of data collection offer insights into critical factors such as energy costs, job creation statistics, impacts on wildlife, and more. Vital sources like the International Renewable Energy Agency and environmental agencies worldwide offer substantial data resources. Analyzing connections between energy costs in Offshore Wind Energy and CO₂ emissions in Maritime Transport allows us to highlight potential cost reductions that could stem from adopting cleaner energy practices.
- **Tourism:** In the Tourism sector, data collection methods would entail a thorough examination of industry reports, environmental studies, and labor surveys. This multi-pronged approach would shed light on various aspects including tourism revenue, prevalence of eco-certifications, efficacy of waste management systems, and the impact on local employment. Sources such as the United Nations World Tourism Organization and local tourism boards are instrumental in providing comprehensive insights. Exploring links between tourism revenue and circular economy practices showcases the substantial economic benefits derived from embracing environmentally friendly tourism initiatives. One would need to ensure that all actors in the sector are engaged. Indeed, limited participation from tourism establishments or local communities in surveys or studies may result in incomplete

information. This is why promoting community involvement through incentivized participation in surveys or data-sharing initiatives to enhance the comprehensiveness of collected data would be key.

- **Cross-Cutting Themes:** Finally, in exploring the cross-cutting themes, a possible approach would involve synthesizing data from a wide array of sources. This would include rigorous analysis of research studies, government reports, and international assessments. These sources shed light on aspects like circular economy practices, social impacts, blue carbon assessments, and more. Key sources such as reports from the European Union and the United Nations Development Programme offer invaluable data repositories. Investigating correlations between circular economy practices and social impacts guides us towards more balanced and holistic policy-making strategies. Here, understanding the complex interrelationships between cross-cutting themes might require specialized expertise and nuanced analysis. One would need to foster continuous collaboration among experts from different fields to facilitate a holistic understanding of cross-cutting themes and identify potential solutions.

Table 3. Data Collection Methods and Sources by Blue Economy Sectors

Sector	Data Collection Methods	Potential Data Sources	Indicator Relationship Analysis
Maritime Transport	Ship monitoring systems, emissions tracking, incident reporting, labor assessments	International Maritime Organization (IMO), European Maritime Safety Agency (EMSA), national maritime authorities, International Labor Organization (ILO)	Explore potential correlations, e.g., CO2 emissions and Offshore Wind Energy's energy cost impacts
Fisheries	Fisheries monitoring, catch documentation, labor inspections	Food and Agriculture Organization (FAO), regional fisheries organizations, industry certifications, labor organizations	Investigate connections between sustainable catch in Fisheries and practices in Aquaculture, identify synergies or conflicts in sustainability efforts
Aquaculture	Aquaculture records, farm inspections, labor assessments	Aquaculture Stewardship Council (ASC), national aquaculture authorities, labor rights organizations	Explore relationships between sustainable practices in Aquaculture and sustainable catch in Fisheries, highlighting impacts or correlations
Offshore Wind Energy	Energy records, environmental assessments, financial disclosures	International Renewable Energy Agency (IRENA), national energy agencies, environmental agencies, financial institutions	Analyze relationships like energy cost and CO2 emissions in Maritime Transport, spotlighting potential cost reductions with cleaner practices
Tourism	Industry reports, environmental studies, labor surveys	United Nations World Tourism Organization (UNWTO), local tourism boards, environmental organizations, labor unions	Explore connections between tourism revenue and circular economy practices, revealing economic benefits from eco-friendly initiatives
Cross-Cutting Themes	Research studies, government reports, international assessments	European Union (EU) circular economy reports, United Nations Development Programme (UNDP), European Commission, International Union for Conservation of Nature (IUCN), financial institutions	Investigate correlations between circular economy practices and social impact indicators, highlighting the need for balanced policy-making

In terms of data collection strategies and standardization, Plan Bleu endeavors to furnish tools and services that cater to the requirements of its member states. However, as discussed in the Marseille workshop, the standardization of data collection presents challenges. For non-European Union member states, ongoing projects are underway, focusing on experience sharing and the establishment of non-restrictive standards, notably employing a systemic approach. Adjustments in data monitoring strategies have been deemed necessary, especially concerning the realm of Sustainable Blue Economy. Attention has also been directed toward the forthcoming SMDD (2025-2030) and its potential as a tool to consolidate indicators and foster cohesion among diverse entities.

VI. Towards an adaptive methodology for measuring the sustainability of the blue economy

Measuring the sustainability of the blue economy represents a complex challenge, necessitating the deployment of adaptable and multidimensional metrics. The intricacy lies in the dynamic interplay between economic, societal, and environmental factors, highlighting the need for targeted assessments that incorporate sector-specific metrics alongside cross-cutting indicators. This holistic approach is essential for comprehensively understanding the interconnectedness between the economy, society, and the environment. In the realm of fisheries and aquaculture, adapting metrics to the specificities of these sectors provides a nuanced understanding of sustainability. Metrics such as the percentage of catch from sustainably managed stocks, fuel efficiency per tonne of catch, and rates of discards and bycatch offer critical insights into the direct impact of fishing activities. These indicators not only assess the health of marine ecosystems but also guide strategies for responsible and sustainable fishing practices.

Turning attention to maritime transport, a set of adaptable metrics becomes paramount in gauging sustainability. Metrics such as CO₂ emissions per ton-mile, the proportion of vessels using alternative fuels, and the frequency of spills and discharges at sea serve as crucial gauges. Beyond assessing the environmental impact, these indicators signal the industry's shift towards eco-friendly transport practices, steering it towards a greener and more sustainable future.

The coastal tourism sector, a significant component of the blue economy, benefits from metrics evaluating its sustainability. The number of eco-certified operators, the extent of marine protected areas, and solid waste management at coastal destinations emerge as pivotal indicators. These metrics provide valuable insights into the environmental and societal impact of tourism, enabling stakeholders to make informed decisions that foster sustainable practices.

Within the circular economy framework of the blue economy, metrics related to the recycling rate of marine plastics, water use efficiency, and food loss and waste reduction take center stage. These metrics shed light on material and resource flows, guiding efforts towards a circular and regenerative approach to economic activities within the marine environment.

In the context of sustainable finance, metrics gauging the availability of innovative financial products, such as blue bonds or insurance covers for coastal adaptation and climate resilience, play a pivotal role. These metrics unveil the influx of capital towards sustainable initiatives, signaling a growing commitment within the financial sector to support projects contributing to the resilience and sustainability of coastal ecosystems.

It is imperative to underscore the **dynamic nature of these metrics**, emphasizing their evolution over time to incorporate new scientific knowledge and adapt to shifting global challenges. The data required for such metrics can be effectively collected through sectoral reporting systems, international monitoring networks, collaborations with key stakeholder groups, and the continuous advancement of data collection systems and sensors.

Establishing a robust foundation of adaptable metrics for measuring blue economy sustainability marks a crucial step towards steering investments, policies, and behaviors in a responsible direction. By weaving together economic sectors, ecosystem health, and human well-being, these metrics provide indispensable insights, vital for managing the blue economy sustainably. This holistic approach ensures the delicate balance between economic prosperity, environmental conservation, and societal well-being is maintained for the benefit of current and future generations.

Developing an adaptive methodology for measuring the sustainability of the blue economy is essential to address the evolving nature of scientific knowledge and global challenges. This methodology can be structured through several key phases, detailed in box 3 below.

Box 3. “Phases” needed to go towards measuring the sustainability of the blue economy

Context Analysis and Identification of Priority Sectors:

- Conduct a detailed analysis of the context, considering climate change, economic dynamics, and social needs.
- Identify priority sectors within the blue economy, accounting for environmental pressures and community needs.

Definition of Core Indicators:

- Select an initial set of core indicators based on scientific evidence and sectoral priorities based on the already provided list of indicators

Pilot Implementation and Initial Data Collection:

- Initiate a pilot program to test the effectiveness of the selected indicators.
- Collect initial data through sectoral reporting systems, international monitoring networks, and collaborations with key stakeholders.

Continuous Feedback and Adaptation:

- Establish a continuous feedback mechanism involving stakeholders, the scientific community, and sectoral interests.
- Adapt indicators based on feedback and the evolution of scientific knowledge.

Integration of New Indicators and Emerging Technologies:

- Monitor the development of new technologies and data collection methodologies.
- Integrate new indicators and emerging technologies into the methodology to enhance accuracy and timeliness of assessments.

Promotion of International Collaboration:

- Foster international collaboration to ensure harmonization of methodologies and facilitate the exchange of data and knowledge.
- Actively participate in global initiatives promoting the sustainability of the blue economy.

Effective Communication of Results:

- Develop a clear and accessible communication system to make assessment results understandable to a broad audience.
- Engage civil society, media, and institutions in interpreting results and supporting corrective actions.

Periodic Assessment and Revision:

- Conduct periodic assessments of the methodology and obtain results.
- Revisit and update the methodology based on acquired experience, new scientific developments, and emerging needs.

Incentivizing Compliance and Accountability:

- Create incentives to encourage voluntary adherence to the methodology by organizations and businesses.
- Implement accountability mechanisms to ensure stakeholders maintain the required standards.

An adaptive methodology of this nature would allow for dynamic and responsive measurement of blue economy sustainability in any given context, enabling continuous improvement and effective management of marine resources for present and future generations. Ensuring the success of an adaptive framework hinges on the development of robust mechanisms for the seamless integration of data into decision-making processes. The dynamic nature of the blue economy necessitates constant adjustments to the measurement framework to align with evolving sustainable activities.

The following table delineates the key principles underlying an adaptive metric designed for the measurement and assessment of sustainability within the blue economy. Recognizing the dynamic and diverse nature of maritime environments, these principles emphasize the need for adaptability, tailoring to specific contexts, and alignment with sustainable activities. The establishment of clear baselines, setting tangible goals, and utilizing context-specific indicators are essential components, ensuring that the metric accurately reflects the unique characteristics of each country's blue economy. Effective data integration and collaboration with stakeholders play a crucial role in developing a robust and responsive metric that contributes to informed decision-making. Furthermore, the principles highlight

the importance of continuous adjustment, promoting the reuse and sharing of data without imposing additional burdens, thus maximizing the utility and relevance of the metric in the pursuit of a responsible and resilient blue economy.

Table 4. Principles related to metrics

Principle	Description
Adaptability	The metric should be designed to accommodate changes in environmental, economic, and social contexts.
Tailorability	Customization of the metric to reflect the unique characteristics and priorities of specific regions or countries.
Baseline Establishment	Clearly defining initial conditions or benchmarks against which progress and changes can be measured.
Tangible Goal Setting	Setting specific and achievable goals aligned with sustainable development objectives and priorities.
Context-Specific Indicators	Using indicators that are relevant to the local or regional context, providing a more accurate assessment, for transboundary regions for example.
Effective Data Integration	Developing mechanisms for seamless integration of data into decision-making processes for informed actions.
Alignment with Activities	Ensuring that the metric aligns with and supports activities promoting a sustainable blue economy.
Data Reuse and Sharing	Promoting the reuse and sharing of data to maximize its utility without imposing additional burdens.
Continuous Adjustment	Recognizing the dynamic nature of the blue economy and allowing for constant adjustments in the metric.
Collaboration and Engagement	Involving key stakeholders and fostering collaboration for the development, implementation, and refinement of the metric.

VII. Short-list of Priority Indicators: Enhancing Relevance to Key Sustainability Challenges in the Mediterranean

One could argue that using too many indicators may lead to confusion and impede one’s capacity to monitor the sustainability of the Blue Economy. Hence, in the pursuit of refining our indicator selection process, **we also suggest a “Priority Short-List of Indicators for the Mediterranean”**. Particular emphasis was placed on aligning chosen metrics with the pressing sustainability challenges prevalent in the Mediterranean region. These challenges encompass a spectrum of issues, ranging from overfishing and the impacts of coastal tourism to pollution and habitat degradation. The focus was on indicators that offer a direct and meaningful connection to these significant challenges, thereby providing insights that are most pertinent and actionable.

Striving for a holistic understanding, we deliberately curated a diverse set of indicators across the three pivotal sustainability dimensions: environmental, economic, and social. A crucial aspect of our indicator selection criteria revolved around the availability and quality of data at the regional Mediterranean level. Preference was accorded to indicators backed by robust data sources, facilitating effective assessment and monitoring over time. Where regional data gaps exist, indicators relying on more comprehensive global or national data were judiciously avoided.

To foster international comparability and coherence with widely recognized sustainability frameworks, we prioritized indicators that correlate strongly with prominent global metrics, such as the UN Sustainable Development Goals. This strategic alignment facilitates not only benchmarking but also positions the Mediterranean region within the broader global sustainability discourse.

In the interest of precision and standardization, our focus gravitated towards indicators with well-defined methodologies and metrics. This approach ensures effective, standardized measurement across countries and regular monitoring. Conversely, indicators with ambiguous or challenging measurement criteria were deliberately excluded from our refined set.

The culmination of these stringent criteria has resulted in the identification of a set of seven priority indicators that collectively deliver a nuanced and balanced perspective. This refined set encompasses a spectrum of facets, including environmental sustainability, social inclusion, economic growth, and governance. Each selected priority indicator serves as a crucial metric, offering insights into specific dimensions of the blue economy’s sustainability.

Table 5. Priority Indicators described

Indicator	Description
Percentage of Sustainably Managed Fish Stocks	Measures the proportion of fish catch harvested from stocks managed and fished sustainably, providing insights into overexploitation and guiding effective fisheries management.
Maritime Transport CO2 Emissions per Ton-Mile	Quantifies carbon efficiency in shipping, offering a metric for tracking decarbonization progress in a sector that constitutes a major source of emissions in maritime activities.
Rate of Loss of Key Coastal and Marine Habitats	Reveals threats to crucial habitats like seagrass, wetlands, and coral reefs that support biodiversity, highlighting trends in habitat degradation and informing conservation efforts.
Number of Eco-Certified Tourism Operators	Signals the adoption of sustainability practices within the tourism sector, offering insights into the management of tourism impacts and the promotion of environmentally conscious practices.
Recycling Rate of Marine Plastics	Measures the transition to circular flows for marine plastics, a common ocean pollutant with ecological impacts, providing a tangible indicator of progress in addressing marine pollution.

Jobs Created in the Blue Economy for Disadvantaged Groups	Indicates social inclusiveness, equitable growth opportunities, and poverty reduction, shedding light on the socio-economic impact of the blue economy on marginalized communities.
Representation of Marginalized Groups in Blue Economy Governance	Ensures participation and empowerment of disadvantaged stakeholders in governance structures, reflecting the commitment to inclusivity and equitable decision-making processes.

This condensed set of indicators, not only retains the multidimensionality of the initial approach but also places a heightened focus on the most salient metrics. The proposed reduction in the number of indicators will be subject to discussion during follow-up workshops with stakeholders. Their invaluable insights will be instrumental in finalizing the indicator selection, ensuring a comprehensive yet streamlined framework that effectively measures sustainability performance and that could be applied in forthcoming case studies that measure the sustainability of the blue economy.

VIII. Enablers for a Mediterranean Framework to thrive: Resources Mobilization, Policy Harmonization and Stakeholders Engagement

Our proposed indicators framework, while fundamental, relies on a confluence of critical components that extend beyond metrics and analysis to truly catalyze impactful change. It is imperative to bear in mind that these components must not merely be considered at the outset but must remain in place throughout the implementation phase and beyond. Specifically :

- Firstly, the efficacy of our framework, as with any framework, crucially hinges on **resource mobilization**. Governments, international organizations, and funding bodies play a key role in driving such initiatives forward. European Funding Programs for Sustainable Coastal Development and Blue Economy Initiatives represent pivotal vehicles for unlocking transformative potential. Leveraging these initiatives would facilitate the implementation of sustainable practices and drive substantive change across the Mediterranean's coastal regions. Table 6 provides a glimpse of various funds that contribute to the sustainable transition agenda, encompassing a wide array of sectors such as fisheries, aquaculture, infrastructure, and capacity building. The funds listed here span a diverse range of financial instruments, including grants and financial instruments at different funding stages, from proof of concept to demonstration, scale-up, and roll-out. Managed by entities such as the European Commission and Member States, these funds cover a spectrum of budgets and lifespans, each dedicated to specific aspects of sustainable development.

Table 6. Selected European Funding Programs for Sustainable Coastal Development and Blue Economy Initiatives

Name of Fund	Overall Fund Budget	Fund Lifespan	Sectors Covered	Funding Stage
Innovation Fund	€38 billion	2020-2030	Fisheries – yes, aquaculture – yes, coastal tourism – NO/NS, Offshore Wind Energy – NO/NS	Grants – yes, financial instruments – yes
Modernisation Fund	€48 billion	2021-2030	Fisheries – no/ns, aquaculture – no/ns, coastal tourism – NO/NS, Offshore Wind Energy – NO/NS	Grants – yes, financial instruments – yes
European Maritime, Fisheries and Aquaculture Fund	€6.108 billion	2021-2027	Fisheries – yes, aquaculture – yes, coastal tourism – NO/NS, Offshore Wind Energy – NO/NS	Grants – yes, financial instruments - yes
European Agricultural Fund for Rural Development	€95.51 billion	2021-2027	Fisheries – no/ns, aquaculture – yes, coastal tourism – NO/NS, Offshore Wind Energy – NO/NS	Grants – yes, financial instruments - yes
Invest EU Blue Economy Fund	€300 million	2019-2026	Fisheries – yes, aquaculture – yes, coastal buidling – yes, Offshore Wind Energy – yes	Grants – yes, financial instruments - yes
Invest EU Green Transition	€500 million	2021-2027	Fisheries – yes, aquaculture – yes, coastal tourism – yes, Offshore Wind Energy – YES	Grants – no, financial instruments - yes
Horizon Europe	€95.51 billion	2021-2027	Fisheries – yes, aquaculture – yes, coastal tourism – NO/NS, Offshore Wind Energy – YES	Grants – yes, financial instruments - yes
European Regional Development Fund	€226.05 billion	2021-2027	Fisheries – yes, aquaculture – yes, coastal tourism – YES, Offshore Wind Energy – YES	Grants – yes, financial instruments – no

European Social Fund+	€99.3 billion	2021-2027	Fisheries – no/ns, aquaculture – no/ns, coastal tourism – NO/NS, Offshore Wind Energy – YES	Grants – yes, financial instruments - yes
Cohesion Fund	€48.03 billion	2021-2027	Fisheries – no/ns, aquaculture – no/ns, coastal tourism – YES, Offshore Wind Energy – YES	Grants – yes, financial instruments - no
Just Transition Fund	€19.2 billion	2021-2027	Fisheries – no/ns, aquaculture – no/ns, coastal tourism – YES, Offshore Wind Energy – YES	Direct grants – yes, financial instruments - yes
Recovery and Resilience Facility	€723 billion	2021-2027	Fisheries – no/ns, aquaculture – no/ns, coastal tourism – YES, Offshore Wind Energy – YES	Direct grants – yes, financial instruments - yes
LIFE Clean Energy Transition	€997 million	2021-2027	Fisheries – no/ns, aquaculture – no/ns, coastal tourism – YES, Offshore Wind Energy – YES	Direct grants – yes, financial instruments - yes
Connecting Europe Facility	€25.8 billion	2021-2027	Fisheries – no/ns, aquaculture – no/ns, coastal tourism – YES, Offshore Wind Energy – YES	Direct grants – yes, financial instruments - yes
Interreg Baltic Sea Region	€235.7 million	2021-2027	Fisheries – yes, aquaculture – yes, coastal tourism – YES, Offshore Wind Energy – YES	Direct grants – yes, financial instruments - yes
Interreg Atlantic Area Programme	€116 million	2021-2027	Fisheries – no/ns, aquaculture – yes, coastal tourism – YES, Offshore Wind Energy – YES	Direct grants – yes, financial instruments – no/ns
Interreg North Sea	€158 million	2021-2027	Fisheries – yes, aquaculture – yes, coastal tourism – YES, Offshore Wind Energy – YES	Direct grants – yes, financial instruments - no
Interreg NEXT Black Sea Basin Programme	€94.4 million	2021-2027	Fisheries – yes, aquaculture – yes, coastal tourism – NO/NS, Offshore Wind Energy – YES	Direct grants – yes, financial instruments - no
Interreg NEXT Mediterranean Sea Basin	€253 million	2021-2027	Fisheries – yes, aquaculture – yes, coastal tourism – YES, Offshore Wind Energy – YES	Direct grants – yes, financial instruments - no
Interreg IPA ADRION (Adriatic-Ionian)	€160.810 million	2021-2027	Fisheries – yes, aquaculture – yes, coastal tourism – YES, Offshore Wind Energy – YES	Direct grants – yes, financial instruments - no

Source: Authors compilation

- Secondly, **harmonizing our framework with existing policies** stands as a linchpin for its integration into the regional landscape. Seamless alignment with established environmental, economic, and developmental policies is imperative. This convergence would not only fortify the relevance of our indicators but also reinforces a unified trajectory towards sustainable blue growth. The proposed Sustainable Blue Economy Monitoring and Evaluation (M&E) Framework exhibits a remarkable depth of alignment with a multitude of key policies, operating seamlessly across diverse scales and sectors. On a global scale, the framework is intricately woven into the fabric of the 2030 Agenda for Sustainable Development. It goes beyond a mere symbolic alignment by incorporating specific indicators that directly correspond to various Sustainable Development Goals (SDGs). In addition to its resonance with SDG 14 (Life Below Water), SDG 13 (Climate Action), and SDG 8 (Decent Work), the framework strategically links its metrics to a broader array of SDGs, including SDG 6 (Clean Water and Sanitation), SDG 12 (Responsible Consumption and Production), and SDG 15 (Life on Land), fostering a comprehensive and interconnected approach to global sustainability challenges. The framework's global engagement extends further to embrace international conventions, notably emphasizing its commitment to the Convention on Biological Diversity's post-2020 global biodiversity framework. By diligently tracking indicators related to protected area coverage, species protection status, and ecosystem integrity, the framework positions itself as a cornerstone in the international effort to safeguard biodiversity. This not only reinforces the global commitment to environmental conservation but also accentuates the framework's role as a catalyst for positive change in concert with international partners.

Moving to the regional context, the alignment of the framework with the Mediterranean Strategy for Sustainable Development (MSSD) 2016-2025 is not a mere nod but a robust commitment. Priority Objective 5 on sustainable

consumption and production patterns becomes a focal point, and the proposed indicators across various sectors play a pivotal role in advancing the MSSD's overarching goals. The framework's compatibility with initiatives led by organizations like the Union for the Mediterranean amplifies its impact, serving as a linchpin in the broader framework of sustainable development and environmental protection in the Mediterranean region.

At the national level, the framework seamlessly integrates with the sustainability initiatives of European Union member states. Its alignment with the EU Blue Economy Report signifies a comprehensive understanding of and contribution to the strategic vision outlined by the European Union. Moreover, the framework dovetails harmoniously with the EU Offshore Renewable Energy Strategy, further reinforcing its adaptability and relevance in the rapidly evolving landscape of sustainable practices. The Circular Economy Action Plan becomes a cornerstone in this integration, showcasing the framework's responsiveness to cutting-edge policy agendas that emphasize circularity metrics, resource efficiency, and recycling across industries.

The framework's commitment extends to sector-specific guidelines, aligning with policies such as the Common Fisheries Policy objectives, which are pivotal for ensuring long-term ecosystem stability. Simultaneously, the framework supports global initiatives, including the IMO Initial Strategy on greenhouse gas reductions and the ILO Work in Fishing Convention C188 on labor regulations. By navigating the intricacies of sector-specific policies, the framework positions itself as a versatile tool capable of accommodating diverse stakeholders and fostering sustainability within specialized domains.

- Thirdly, an indispensable pillar supporting our framework is **active and inclusive stakeholder engagement**. By fostering collaboration and garnering diverse perspectives, we can cultivate shared ownership and commitment essential for sustainable progress. Stakeholder engagement stands as an indispensable cornerstone in the pursuit of sustainability within the Mediterranean blue economy. The Mediterranean, with its intricate blend of coastal states, fishing communities, aquaculture enterprises, conservationists, researchers, certification bodies, labor unions, coastal communities, and tourism associations, constitutes a complex ecosystem where the interplay of interests and objectives can be intricate. Each stakeholder brings forth a unique perspective and expertise that is crucial in achieving a harmonious and sustainable coexistence. Table 7 outlines the fundamental stakeholders within the Mediterranean blue economy but also highlights strategies for their engagement and underscores the substantial benefits derived from their active involvement. From a practical standpoint, such stakeholders are also indispensable for obtaining feedback and revising the blue economy sustainability assessment framework, ensuring that the framework remains relevant, accurate, and effective over time (see box 4).

Box 4. The need for a Feedback and Revision Mechanism

Establishing a mechanism for obtaining feedback and revising the blue economy sustainability assessment framework is essential for ensuring that the framework remains relevant, accurate, and effective over time. Feedback mechanisms can help identify emerging issues, improve the assessment process, and incorporate stakeholder perspectives. Below is a proposed mechanism:

- The development and refinement of the blue economy sustainability assessment framework in the Mediterranean region should be guided by a comprehensive approach that emphasizes stakeholder engagement and continuous improvement.
- Regular stakeholder consultations involving government authorities, industry representatives, environmental organizations, research institutions, and local communities can be conducted at key milestones in the assessment process.
- An online feedback portal would offer accessibility for stakeholders to submit feedback, suggestions, and comments, while surveys and questionnaires would be periodically distributed to gather input on various assessment aspects.
- Advisory committees comprising diverse stakeholder groups would convene regularly to discuss the framework, identify areas for improvement, and offer recommendations. External reviews by independent experts and organizations would provide fresh perspectives and help identify potential

blind spots. The feedback collection process can maintain transparency, encourage diverse participation, and analyse collected feedback for common themes and areas of concern. In the revision process, stakeholders would be actively involved, and proposed changes prioritized based on feedback significance and alignment with scientific knowledge.

- Subject matter experts and researchers would be consulted, and major revisions may be pilot tested for feasibility and effectiveness. Comprehensive documentation would be maintained throughout the process. Communication would be prioritized with the publication of feedback reports summarizing revisions and their rationale, demonstrating the framework's responsiveness. Continuous stakeholder engagement and transparency would ensure that the framework remains adaptable and provide valuable insights into the sustainability of blue economy sectors in the Mediterranean region in an evolving and dynamic landscape.

For further details on stakeholder engagement strategies and plans, one may refer to the annexes providing some details from the "**Regional Workshop - Towards Data-Driven Sustainability in the Mediterranean Blue Economy**" and the "**Preliminary Guiding Questions for Sessions.**" Stakeholder engagement within the Mediterranean's blue economy presents multifaceted benefits. It fosters regional cooperation, forging unified strategies for sustainable resource management. Leveraging local expertise becomes instrumental in conserving Mediterranean resources, while partnerships with marine protected areas and conservation groups reinforce efforts to safeguard its unique ecosystems. Collaboration with maritime entities aids in formulating safety standards and regulatory frameworks. Engaging tourism stakeholders ensures the sustainable evolution of coastal tourism, securing its enduring presence. Moreover, facilitating data sharing and research collaborations with Mediterranean research institutions enriches the scientific foundation essential for comprehensive sustainability assessments in the region.

One crucial concept that underscores this engagement is the notion of **Participatory Processes for Ownership**. This concept involves the active engagement of diverse stakeholders in participatory processes, specifically for co-designing and monitoring the measurement platform. By doing so, it aims to cultivate a sense of collective ownership, fostering a shared responsibility among stakeholders. Furthermore, this participatory approach ensures relevance across governance levels, acknowledging the varied perspectives and expertise that each stakeholder brings to the table. In the realm of the blue economy, the complexities are further accentuated by the diversity of interests, ranging from coastal states and fishing communities to aquaculture enterprises, environmental NGOs, and tourism associations. This constitutes a complex ecosystem where the interplay of interests and objectives can be exceptionally nuanced.

Another pivotal concept in this context is **Coordination and Integration**. While various discrete framework elements have been identified, there is a resounding call for greater coordination to develop integrated indexes specifically tailored to the broader blue economy. The approach shall not only acknowledge the complexities inherent in the interplay of various sectors but also emphasize the need for a unified, comprehensive strategy to navigate the challenges and opportunities that define the sustainability landscape in the Mediterranean.

Table 7. Stakeholder Groups, Description, and Engagement Strategies in Mediterranean Blue Economy Sustainability

Stakeholder Group	Description	Engagement Strategy
Mediterranean Coastal States	Countries bordering the Mediterranean with authorities overseeing fisheries, maritime transport, and tourism.	Regional Consultations: Regional forums and consultations that bring together Mediterranean Coastal States to discuss regional cooperation and sustainability strategies.
Mediterranean Fishermen's Associations	Organizations representing fishermen and fishing communities in the Mediterranean.	Fishermen's Dialogues : Establishing dialogues with fishermen's associations and coastal communities to gather insights and concerns on fisheries and aquaculture practices.
Aquaculture Enterprises	Industry associations and institutions involved in aquaculture operations in Mediterranean countries.	Marine Protected Areas Network: Engaging with organizations involved in managing and conserving marine protected areas in the Mediterranean such as the Regional Activity Centre for Specially Protected Areas (RAC/SPA).

Environmental and Conservation NGOs	Organizations advocating for sustainable practices in the Mediterranean's environmental conservation efforts.	Maritime Organizations: Collaboration with organizations like the Union for the Mediterranean (UfM) and the European Maritime Safety Agency (EMSA) for maritime transport sustainability.
Mediterranean Research Institutions	Universities and research centers contributing scientific research and data relevant to sustainability.	Tourism Sustainability Workshops: Organizing workshops and conferences to involve tourism associations, local communities, and tourism operators in discussions on coastal tourism sustainability.
Mediterranean Certification Bodies	Organizations certifying sustainable practices in the Mediterranean, ensuring adherence to set standards.	Scientific Collaboration: Partnering with Mediterranean research institutions for data sharing, scientific research, and sustainability assessments.
Mediterranean Labor Unions and Workers' Reps	Associations representing laborers in fisheries and maritime transport sectors, ensuring fair practices and safety.	Participation in Fishermen's Dialogues
Mediterranean Coastal Communities	Local communities around the Mediterranean Sea concerned with coastal tourism and sustainability.	Community Engagement Meetings and participation in Regional Consultations
Tourism Associations	Organizations representing the tourism industry in Mediterranean countries, invested in coastal tourism sustainability.	Stakeholder Roundtables
Data gathering and observing research centers/ NGOs	Institutions managing collective databases, holding blue economy metrics.	Collaborative Data Summits

Source: Authors compilation

Box 5. Synergies with the Plan Bleu Observatory: Enhancing Stakeholder Engagement through Comprehensive Monitoring and Communication Strategies

The workshop's discussions provided some recommendations to elevate stakeholder engagement.

Promotional materials have emerged as a pivotal facet that could be capitalized-on. By leveraging visually compelling materials, stakeholders are not only informed but also captivated, ensuring a more profound understanding and resonance with the initiatives undertaken.

Complementing this, the notion of ancillary activities within the Plan Bleu framework may take shape through proposed informational campaigns. These campaigns can serve a dual purpose: to sustain stakeholder involvement by keeping them consistently informed and to deepen their awareness. The envisaged outcome is a heightened level of commitment and a more profound understanding among stakeholders of the intricacies involved in coastal and environmental endeavors.

Crucially, it is worthy to highlight the power of narrative indicators as catalysts for thought-provoking engagement. Beyond mere data points, these indicators are envisioned to stimulate reflection and elicit responses from stakeholders. Examples include prompting individuals to articulate the personal value they attribute to coastal areas or encouraging observations regarding potential pollution along their shorelines. This narrative approach is hailed as a potent method for fostering a global-scale involvement of stakeholders.

A key recommendation also relates to the regular publication of communications by the Plan Bleu Observatory. An envisioned initiative, potentially titled "Map of the Month," could serve as a linchpin in the comprehensive strategy. It would aim to systematically disseminate information, offering stakeholders invaluable insights and real-time updates on coastal and environmental issues.

IX. Looking Ahead : Pilot Study Design

Moving forward, initiating pilot studies led by Plan Bleu becomes a logical progression to refine our framework, gather data, collaborate with stakeholders, and identify best practices. Pilot studies serve as invaluable stepping stones toward a more robust and effective implementation. These studies can offer a practical testing ground, allowing for real-world application, data gathering, and stakeholder engagement. They enable validation of the indicators' relevance while identifying best practices and potential areas for improvement. They may serve as a strategic risk mitigation strategy, fostering an iterative development process that ensures the framework's adaptability and effectiveness. Ultimately, they can pave the way for a more impactful and informed implementation of sustainable measures within the Blue Economy, aligning with adaptive management principles for ongoing refinement and success.

Table 8. Implications for a Pilot Study

Objectives	What it would allow
Framework Evaluation	Test and evaluate the efficiency of a tailored Sustainable Blue Economy framework
Customization	Address unique cultural, economic, and environmental challenges
Data Collection	Gather essential data on blue economy sectors, governance, and local environment
Engagement with Stakeholders	Possibility to collaborate with diverse stakeholders for holistic assessment
Best Practices Identification	Identify and acknowledge areas of excellence and improvement in sustainable practices

Following consultations and capitalizing on the discussions of the Marseille workshop, below we suggest locations for pilot studies that may serve as testing grounds for assessing the framework's effectiveness in addressing regional challenges and priorities.

A. PALAMÓS, SPAIN: A BEACON OF SUSTAINABLE BLUE ECONOMY IN THE MEDITERRANEAN

Why Palamós?



The Mediterranean Sea, renowned for its diverse biodiversity, contends with persistent challenges arising from intensive fishing activities. Establishing robust management plans in this region remains pivotal to ensuring the preservation of marine ecosystems alongside the sustainability of fish stocks. Palamós, within Catalonia, exemplifies a remarkable case of collaborative fisheries management. A partnership between local fishing communities and marine scientists resulted in the formulation of the Long-Term Management Plan. Officially endorsed by the Spanish Government in 2013, this initiative predominantly focused on the red shrimp (*Aristeus antennatus*), a vital species in the western and central Mediterranean's fishing industry. Despite its

strategic importance, a concerning decline in the red shrimp population in 2005 brought forth the necessity for sustainable practices (Maiken Bjørkan, et al., 2020). Over time, the red shrimp fishery management in Palamós has progressively evolved through locally-driven regulatory measures. Spearheaded by local fishers, these efforts aimed to foster sustainable practices while preserving the species and maintaining ecological balance. The series of regulatory milestones from 1999 to 2018 reflects Palamós' ongoing commitment to balancing fishing activities with marine life preservation, particularly concerning the red shrimp

Palamós serves as a compelling example of effective and collaborative fisheries management, blending local knowledge with scientific research to craft sustainable fishing regulations. The collective endeavors in Palamós, notably in the red shrimp fishery, illustrate the potential of collaborative governance involving diverse stakeholders like fishing communities, scientists, and policymakers. This coordinated approach culminated in a comprehensive management plan that harmonizes ecological needs with economic activities, ensuring sustainability in marine resource exploitation (Reference_Bjorkan, et al., 2020). Palamós' regulatory framework, which includes area delineations, gear restrictions, and fishing seasons, aims to safeguard fish stocks while supporting the local fishing community's livelihoods (Reference_Bjorkan, et al., 2020).

The findings from a pilot study in Palamós would serve as a guiding model for other Mediterranean regions aspiring to implement similar sustainable blue economy assessments. Tailoring the framework to Palamós' distinct characteristics and challenges will drive the broader Mediterranean region towards responsible and sustainable blue economy practices, ensuring marine ecosystem preservation, economic prosperity, and community well-being. Palamós emerges as a symbol of commitment towards fostering sustainability and responsible resource management in the Mediterranean.

B. PILOT STUDY IN THE IONIAN ISLANDS, GREECE: ASSESSING AND ADVANCING SUSTAINABLE BLUE ECONOMY PRACTICES IN THE MEDITERRANEAN

Why the Ionian Islands?



The Ionian Islands, located in Greece's western region, provide an ideal setting for a pilot study due to their diverse maritime environment. This location facilitates a comprehensive evaluation of various sectors such as fishing, shipping, and tourism. With its natural beauty attracting global tourists, the islands offer a platform to assess tourism-related impacts, including revenue and waste management. Additionally, the thriving fishing industry in the Ionian Sea allows examination of indicators related to sustainable fishing practices and labor standards. Opportunities for aquaculture activities further enable the evaluation of sustainable mariculture practices and disease outbreaks. The presence of ports and maritime traffic allows assessment of transport-related indicators like CO2 emissions and alternative fuel adoption. The islands' local governance structures and cultural significance provide avenues for community engagement and consideration of social impacts. With Greece's accessible data reporting mechanisms, this region becomes an exemplary model for assessing circular economy metrics and safeguarding marine ecosystems in the Mediterranean.

C. OTHER POTENTIAL PILOT AREAS, AS SUGGESTED DURING THE MARSEILLE WORKSHOP

Zembra MPA, Tunisia

Nestled along the northeastern coast of Africa, Tunisia offers a unique prospect to extend the pilot study on sustainable blue economy practices into North Africa. Zembra Marine Protected Area (MPA), situated off the Tunisian coast, stands as an ideal testing ground for several compelling reasons. Renowned as a biodiversity hotspot, Zembra hosts diverse marine habitats and species, forming a solid foundation for assessing indicators related to biodiversity preservation, ecosystem health, and human impacts on marine life. The area's significance extends to sustaining fishing activities, harboring considerable aquaculture potential, and attracting tourists keen on snorkeling and diving. This diverse scope allows for a thorough evaluation of sustainable practices, economic benefits, and marine ecosystem conservation in tourism. Additionally, Zembra's cultural heritage and historical value provide an opportunity to integrate cultural impact indicators into the assessment, aligning sustainable blue economy practices with cultural preservation. As North Africa grapples with climate challenges, evaluating Zembra MPA's resilience to climate change becomes vital, focusing on adaptation strategies and measures to bolster marine ecosystem resilience. Expanding the pilot study to Zembra MPA could position Tunisia to spearhead sustainable blue economy practices in North Africa.

Nice (Côte d'Azur), France

Nice's strategic location as a bustling tourist hotspot presents an opportunity to explore sustainable tourism practices. The region's tourism-centric economy necessitates a nuanced approach to manage visitor influx while safeguarding the environment. Assessing indicators related to waste management, conservation efforts in popular natural sites, and the integration of eco-friendly tourism practices could offer valuable insights into balancing economic prosperity with environmental preservation. Furthermore, the city's commitment to coastal management and preservation initiatives forms a crucial aspect of the sustainable blue economy narrative. Examining measures to mitigate coastal erosion, protect marine biodiversity, and implement innovative coastal zone management strategies could serve as a blueprint for other Mediterranean coastal cities facing similar challenges. Data availability and Nice's alignment with France's national policies focusing on sustainable development and marine conservation further strengthens its suitability as a case study.

South East Mediterranean (Greece, Cyprus, Turkey, Egypt)

From Greece and Cyprus with their European Union affiliations to Turkey's unique geopolitical positioning bridging Europe and Asia, and Egypt's pivotal role in the African continent, these nations collectively represent varying levels of economic development within the Mediterranean. This geographical cluster offers rich contrasts, showcasing different stages of economic growth, cultural diversity, and environmental challenges. Yet, a common thread unites them: a shared commitment to sustainable development and substantial statistical capacities which bolster the viability of conducting a comprehensive assessment of sustainable blue economy indicators. Accessible and reliable data reporting mechanisms in these countries enhance the accuracy of assessments, facilitating informed decision-making and policy formulation. A case study focusing on this set of countries would be more ambitious and could yield invaluable insights into the shared challenges and innovative solutions concerning sustainable fisheries, coastal management, maritime transport, and tourism practices. Additionally, it would present a better opportunity for knowledge exchange.

Conclusion and next steps

This scoping study has underscored the necessity of a holistic approach encompassing environmental, economic, social, and governance facets within the Mediterranean's blue economy. Our analysis, rooted in extensive research, has unearthed gaps in existing sustainability assessment tools, particularly concerning emerging sectors, ecosystem health monitoring, and social equity assurance. To address these gaps, we meticulously curated a selection of over 50 tailored indicators, aligning them with regional challenges and global frameworks while prioritizing their applicability and actionable nature.

The collaborative workshop served as a crucial forum where diverse regional stakeholders contributed insights, refining the indicator set to strike a balance between comprehensiveness, adaptability, and practical feasibility. Discussions emphasized the importance of aligning the framework with cross-sectoral policies and governance levels, highlighting the need for participatory processes to ensure collective ownership. Our inclusive methodology, continuously seeking stakeholder feedback, guarantees adaptability to scientific advancements, evolving policies, and on-the-ground realities.

Moving forward, **the next crucial steps** demand proactive engagement and strategic initiatives to solidify and actualize the insights gleaned from this scoping study. Specifically:

- A pivotal action on the horizon is the **organization of a comprehensive follow-up workshop, designed to formalize the adoption of a refined indicators framework**. This workshop could serve as a collective platform, inviting stakeholders from various sectors, academia, government bodies, and NGOs, to deliberate and harmonize the metrics, ensuring consensus on the indicators' selection and measurement methodologies. This collaborative effort aims to create a unified understanding and commitment towards the finalized framework, setting the stage for its practical implementation.
- Furthermore, the **launch of pilot studies in key Mediterranean regions** such as Spain, Greece, France, and Tunisia stands as a critical stride toward validating the framework's adaptability and efficacy across diverse contexts. These pilot studies will act as living laboratories, rigorously testing the application and feasibility of the indicators in real-world scenarios. They will provide invaluable insights into the framework's practicality, uncovering nuances specific to each region while identifying best practices and potential challenges. This empirical validation will offer a roadmap for refinement and optimization before broader implementation.
- To fortify the sustainability of this endeavor, **ongoing stakeholder engagement must remain a cornerstone**. Continuous dialogue, feedback loops, and participatory mechanisms will ensure the framework's relevance amid evolving circumstances, reinforcing ownership and commitment across stakeholders. Moreover, capacity-building initiatives aimed at empowering local communities, policymakers, and practitioners with the requisite knowledge and tools can catalyze effective implementation and will be explored.
- **Fostering strategic partnerships, both regionally and internationally, will also be instrumental**. Collaboration with institutions, funding bodies, and industry stakeholders will not only leverage resources but also enhance knowledge exchange, fostering innovation and scalability. These efforts, that Plan Bleu plans to undertake, underscore our steadfast dedication to nurturing a resilient, equitable, and thriving blue economy. They represent a concerted commitment to realizing an ecosystem where the harmonious coexistence of environmental sustainability and human progress fosters sustained regional prosperity, a testament to our shared vision for the Mediterranean's future.

Annex I: Workshop with Stakeholders: Regional Workshop - Towards Data-Driven Sustainability in the Mediterranean Blue Economy

WORKSHOP SUMMARY

The forthcoming Regional Workshop, "Towards Data-Driven Sustainability in the Mediterranean Blue Economy," scheduled for November 23rd, 2023, in Marseille, France, marks the initiation of discussions on expectations, realities, and the transition framework. This event, a 1-day workshop, is organized by Plan Bleu, in partnership with the UNEP World Conservation Monitoring Centre (WCMC), operating under the United Nations Environment Programme/Mediterranean Action Plan (UNEP/MAP).

CONTEXT AND RATIONALE

Plan Bleu, functioning as a regional hub under UNEP/MAP, champions sustainable development and environmental preservation across the Mediterranean. Drawing from its substantial experience, Plan Bleu leads the charge in evaluating and monitoring sustainability in the Mediterranean Blue Economy. The Observatory, evolving into a pivotal monitoring tool, facilitates reporting on the Mediterranean Strategy for Sustainable Development (MSSD) implementation. With multiple indicators per topic and overarching indicators, this initiative aids informed decision-making while scrutinizing indicators related to maritime spatial planning.

The burgeoning Mediterranean Blue Economy necessitates an expansive framework that augments existing indicators and fortifies sector-specific sub-indicators. Collaborative endeavors involving institutions like Direction Interrégionale de la Mer - DIRM, Rhône Mediterranean and Corsica Water Agency, UNEP World Conservation Monitoring Centre - WCMC, EU DGMARE, and UNEP/MAP underscore the urgency for this ambitious initiative. Plan Bleu envisions an integrated assessment framework aligned with MSSD 2016-2025, the Sustainable Development Goals (SDGs), and the Regional Action Plan for Sustainable Consumption and Production, striving towards a resilient and sustainable Blue Economy in the Mediterranean.

OBJECTIVES

The workshop aimed to cultivate collaboration, knowledge sharing, and consensus-building among stakeholders and initiate a commitment to UNEP/MAP Plan Bleu's Observatory on Environment and Development, particularly its Blue Economy component. It sought to pave the way for ongoing dialogues, partnerships, and sustained efforts toward a sustainable and inclusive Blue Economy in the Mediterranean.

Specifically, the workshop intended to:

- Co-develop a transition framework for the Sustainable Blue Economy, guiding countries toward deliberate and structured sustainability.
- Assess options for monitoring progress toward a sustainable blue economy in the Mediterranean and outline key next steps.
- Identify a set of Blue Economy indicators that enhance the region's capacity for sustainable development.
- Act as a catalyst for stakeholder convergence, bringing together representatives from various sectors to define priorities and strategies for a Sustainable Blue Economy in the Mediterranean.

Workshop Structure and Agenda

The workshop featured interactive roundtable discussions structured around guiding questions (see Annex 1 for more guiding questions). It was divided into two key sessions:

Session 1: Expanding Indicator Frameworks (Research-driven)

This session delved into indicators beyond traditional economic measures, exploring their potential to monitor the interplay between economic activities and environmental and societal impacts. Experts from various fields discussed possible indicators and strategies to obtain and use these indicators across sectors.

Guiding Questions for Discussion:

- What indicators shall an ideal framework include? How do we combine quantitative and qualitative data to inform the forthcoming “Blue Economy Survey”? What challenges exist in doing so?
- How can we comprehensively assess the social impact of Blue Economy activities, considering factors like job creation, community resilience, and gender inclusiveness?
- What strategies can facilitate the development of cross-cutting indicators, like circular economy metrics or sustainable sourcing practices, universally applicable and reflective of Blue Economy sustainability?
- How can data collection processes be streamlined for efficiency and comparability across countries, resolving regional differences?

Session 2: Inclusive Stakeholder Engagement

This session focused on engaging diverse stakeholders to gauge the sustainability of the Mediterranean Blue Economy. It explored mechanisms and experience sharing for inclusive involvement, collaboration strategies, and resources required for sustainability frameworks.

Guiding Questions for Discussion:

- How can governments and regional organizations collaborate to establish governance structures ensuring continued stakeholder involvement in evolving indicators?
- What mechanisms can enable data-sharing agreements between governments, industries, and research institutions for sustainability indicators?
- What resources, including technology and expertise, are needed to implement data frameworks across Mediterranean countries? How can assistance from Northern countries support Southern/Eastern counterparts?
- What role can digital platforms and mobile applications play in democratizing data collection for stakeholders?
- How can successful case studies of inclusive stakeholder engagement be documented and shared, guiding other countries in constructing their Blue Economy indicators?

OUTPUTS

The Regional Workshop served as a vibrant platform for exchanging insights on how to advance integrated and participatory sustainability measurement frameworks tailored to Mediterranean peculiarities. The diversity of expertise convened set the stage for continued cross-pollination of knowledge and methodologies adapted to this complex region, while highlighting the need to differentiate blue economy and blue sustainable economy.

A rich array of potential indicators emerged from the discussions, categorized across established and emerging Blue Economy sectors as well as multi-sectoral themes. While too extensive to enumerate here, some highlights include:

- Fisheries & Aquaculture: Share of sustainably certified seafood; juvenile replenishment rates defining stock resilience; phosphorous discharge levels; product innovations for by-products
- Coastal Tourism: Water consumption per tourist; share of tourism economies adopting eco-certification; number of protected marine spaces with visitor capacities
- Marine Renewables: Shared infrastructure across commercial arrays; trials for co-use of spaces with fishing/aquaculture
- Port Activities & Maritime Transport: Passenger and freight traffic volume; low sulfur fuels adoption, ports labeled as “blue” or “green”
- Cross-cutting: Seafloor & coastal artificialization rates affecting biodiversity; carbon footprint tracking & offsetting tools; plastics recycling; social inclusiveness of workforce

The workshop also yielded strategic insights on pragmatic ways to systematically obtain good quality data for the identified indicators across the region. These highlighted:

- Clarifying institutional mandates for indicator ownership & reporting lines

- Developing common metadata standards enabling discoverability & interoperability
- Non-restrictive methodologies adaptable across member states
- Twinning programs for experience exchange & capacity building
- Exploring public-private, and NGO-research institutes, data partnerships to fill gaps in knowledge
- Independent validation mechanisms given variability in national statistics
- In terms of geography, suggestions coalesced around pilot sites like the Ionian Islands, Spain's Palamos bay and Tunisia's Zembra island for showcasing integrated approaches, leveraging available environmental, social and economic datasets. More suggestions covered the Alpes Maritimes sector in France, the East and South of Tunisia, but also the Aegean Sea, taking into account a transboundary and multi countries contexts. Discussions also covered prospective coordination to enable frameworks scalable across the Mediterranean while retaining local adaptability.

For the Plan of Work 2024-2025, ideas centered on participatory multi-stakeholder processes for collaborative design, application and iteration of measurement platforms interweaving priorities of communities, policymakers and practitioners. Activities encompassed:

- Multi-criteria tools mapping interlinkages across Blue Economy dimensions
- Modeling sustainability scenarios integrating trends & policy objectives
- Synthesizing lessons from context-specific implementations
- Communication instrument for transparency and accessibility
- Capacity building module for sustainability skills & data literacy
- Clarifying feedback mechanisms with stakeholders

The suggested process would entail consolidation of disparate measurement frameworks into an overarching yet adaptable index co-developed bottom-up for ownership and relevance. This requires underpinning partnerships, financing mechanisms and open architectures supported nationally and through donor programs.

Participants emphasized engaging stakeholders from the proposal stage through sustained awareness campaigns, storytelling with tangible indicators, showcasing project impacts, and consistent updates like "Blue Economy Briefs". Strategic recommendations included a Mediterranean Mission model inspired by the EU Missions orienting collaboration and investments towards common goals like healthy oceans or climate resilience.

CONCLUSION

The Regional Workshop highlighted the necessity for:

- Flexible yet comparable indicators, adaptable across diverse contexts, priorities and capacities
- Long-term commitments and investments in statistical capacities for consistent data gathering and data quality assessment
- Multi-stakeholder participatory processes for contextual relevance, collective ownership and co-creation
- Consolidating disparate measurement frameworks into an integrated sustainability index reflecting interlinkages
- Interoperable open data systems and coordinated workflows across entities and geographies
- Communication strategies for transparency, accessibility and sustained engagement
- Financing assistance balancing North-South asymmetries and public-private synergies

Points of convergence included seizing opportunities within global policy milestones over the next biennium and forthcoming funding cycles to implement sustainability initiatives. These include acting upon the post-2020 biodiversity framework, advancing Ocean Decade actions as well as priorities under the European Green Deal supporting the bloc's transition towards climate neutrality.

Participants emphasized that integrated approaches call for clustering multi-disciplinary expertise and digitally-enabled collective intelligence along nourishing innovation ecosystems. This entails pooling data, tools and analytical capabilities for responsive and informed governance. Importantly, collaborative models should interweave scientific evidence with traditional ecological knowledge and community insights.

For securing transformative change, discussions underlined that interventions must target root causes within complex systems rather than symptomatic fixes. Holistic transition roadmaps necessitate envisioning risks, trade-offs and interdependencies between social, economic and environmental dimensions across timescales. This demands exploring sustainability limits, scenario modeling and balanced metrics usable across contexts.

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