

# MOSSES

Maritime, Ocean Sector and Ecosystem Sustainability: Fostering Blue Growth in Atlantic Industries

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## Mainstreaming marine biodiversity into blue economy policies and practices as a requirement for sustainable blue growth in the EU Atlantic Area

ACTION NUMBER: 1

Work Package: 3  
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Date: 16-07-2021

## **1. Introduction**

The goal of the MOSES project is to examine the growth achieved in the marine sectors across the Atlantic Arc, to estimate possible environmental pressures and impacts from these sectors and to suggest indicative transition paths for a number of these sectors (namely maritime transportation and ports, tourism, marine renewable energy, aquaculture and fisheries) towards sustainable Blue Growth.

Work Package 3 of MOSES was about developing and implementing a capitalisation strategy focusing on synthesis and translation of findings from the MOSES project while requiring active participation of key representatives from each examined sector. The aim was to develop support materials and data products for policy makers and other stakeholders to help them to meet European goals in relation to blue growth objectives and marine-biodiversity protection policies.

The integration or mainstreaming of marine biodiversity policy into blue economy policies requires the development of capacities which promote joint reflection, co-creation of knowledge and multi-actor responsiveness across different spatial and jurisdictional frameworks, and across diverse policy departmental and academic disciplinary silos, several sectors and practice communities and alternative stages of innovation and policy processes. In order to address all these requirements, the approach that was followed was to gather evidence of what interventions work well, in what circumstances and why and to combine this analysis of evidence, with approaches suggested by the theory on environmental and biodiversity policy integration. This evidence was collected from various publications about the interactions of marine biodiversity and blue economy as well as from already published MOSES outputs with the active input of key stakeholders engaged in various instances throughout the project.

The report can be useful to EU-wide organisations that deal with either marine environmental or economic issues and can assist other regions in understanding and quantifying the sustainability dimension of Blue Growth with respect to the potential environmental impact of key strategic marine sectors.

## **2. The need to address environmental implications of sustainable blue growth**

The blue economy that encompasses industries and sectors related to oceans, seas and coasts is a fast-moving segment of Europe's economy. Together with traditional sectors such as fisheries, tourism and maritime transportation, innovative sectors such as ocean

renewable energy, the blue bio-economy, bio-technology and desalination are evolving and growing, thus providing new prospects and creating jobs. However, all these economic activities may have negative impacts on the marine environment, although not all to the same extent. These impacts may include various types of pollution such as plastic litter, oil spills, micro-plastics, underwater noise and chemicals and nutrients. Other impacts may refer to over-exploitation of resources, destruction of natural habitats and biodiversity loss.

In the meantime, climate change adds other negative effects such as changes in water temperature, acidification, rising sea levels and frequent and intense flooding and erosion. Eventually, all these negative effects and impacts challenge the resilience of the blue economy and coastal societies, a fact that requires urgent response by those policy makers and practitioners representing environmental, economic and societal interests. To emphasise the importance of this issue, the updated EU strategy on blue growth highlights the fact that the blue economy needs to be sustainable and respect potential environmental concerns given the fragile nature of the marine environment. It is hence important to study how addressing all these challenges can be an integral part when planning economic activities at sea. With that in mind, the present document attempts to focus on one of these challenges i.e. marine biodiversity loss, on actions needed to address this challenge and on ways these actions could be integrated into blue economy policies and practices in order to ensure sustainable blue growth.

### **3. Marine biodiversity protection and blue growth**

#### **3.1 Marine biodiversity policy landscape in the EU and the AA**

At the EU policy level, extensive policy instruments exist when it comes to address the complexity of aquatic biodiversity conservation (all implemented by the 27 EU member states). However, according to Rouillard et al. (2018), the most important ones that set more specific objectives and targets for the protection of aquatic biodiversity are:

- The EU Birds and Habitats Directives (B&HD) (EC, 2009a; EEC, 1992) which are two separate directives and their objective is to protect birds, endemic animal and plant species and around 200 rare habitats, in order to maintain or restore a favourable conservation status (Sundseth, 2014);
- The Water Framework Directive (WFD) (EC, 2000) which focuses on the management of water resources and its purpose is to prevent deterioration of water bodies] and enhance the status of these aquatic systems- and its wetlands; it also promotes a sustainable use of water (Chave, 2001);

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- The Marine Strategy Framework Directive (MSFD) (EC, 2008a): that has advocated for a better understanding of the pressures and impacts of human activities on the sea, marine biodiversity, aquatic habitats and the ecosystem in general. Also, this directive aims to protect the marine environments across Europe (achieving the Good Environmental Status- GES based on detailed criteria and the methodological standards to help the member states implement this directive. The MSFD is a legislative framework that manages the impact that human activities have in the marine environment, integrating concepts such as environmental protection and sustainable use of these ecosystems (EC, 2008a).

Also, more recently, in May 2020 the EU Biodiversity Strategy 2030 (EC, 2020) was adopted. This strategy, which includes 6 targets and 20 associated Actions, sets the roadmap for the EU to meet not only its own biodiversity conservation goals but also the global objectives set by the Convention on Biological Diversity (CBD). This strategy intends to strengthen the protection of marine ecosystems in order to achieve “good environmental status”. The overexploitation of the fish stocks (or its reaching of ‘Maximum Sustainable Yield’ levels), bycatch, species that are threatened with extinction (or in a bad status of conservation) and damage done to the seabed are some of the stresses that, in this strategy’s point of view, need an ecosystem-based approach in order to be tackled.

At the regional level there are instruments that guide the international cooperation for the protection of the coastal and marine environment like the Regional Seas Conventions (RSC) that are part of the United Nations Environment Programme (UNEP) Regional Seas Programme (UN, 2021b). The RSC of relevance to the present study is the Convention for the Protection of the Marine Environment in the North-East Atlantic – the OSPAR Convention (OSPAR, 1992). According to Ribeiro and Olsen (2013), one of the purposes of the OSPAR Convention was the establishment of a network of MPAs that cover a total area of 287,065km<sup>2</sup>, protecting a series of seamounts and sections of the Mid-Atlantic Ridge and hosting a range of vulnerable deep-sea habitats and species. Another topic of interest for OSPAR is addressing threats to the marine ecosystems such as: eutrophication, hazardous substances, radioactive substances, offshore oil and gas industry, biodiversity and ecosystems. These areas of interest are monitored and the results of this monitoring are used for strategy implementation. The OSPAR Convention has the same goals as MSFD: achieve GES; this is why the EC encourages the OSPAR Parties to take into account regionally coordinated MSFD implementation when working in OSPAR.

Another policy tool that is based on regional cooperation is the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS) and its purpose is to reduce threats to cetaceans by improving

knowledge on them. This agreement encompasses threats like anthropogenic noise, bycatch, cetacean populations, cetacean watching, climate change, marine litter, protected areas, ship strikes and strandings. In the 2019 meeting a new strategy was adopted with the overall goal “to manage effectively the Agreement and to improve the conservation status of cetaceans and of their habitats in the area of competence of the Agreement by 2030”.

Of relevance to the AA is also the Agreement on the Conservation of Small Cetaceans of the Baltic, North-East Atlantic, Irish and North Seas (ASCOBANS). This Agreement was concluded in 1991, under the authority of the Convention of Migratory Species (CMS) and was implemented in 1994 and is under the administration of UNEP.

Finally the North-East Atlantic Fisheries Commission (NEAFC) plays an important role with regard to marine biodiversity protection in the AA, as its main goal is “to provide a forum for consultation and exchange of information on the state of fisheries resources in the Northeast Atlantic and on related management policies to ensure the conservation and optimal utilisation of such resources, and to set conservation measures in waters outside national jurisdiction” (Swan, 2003; Bjørndal, 2009).

### **3.2 The concept of marine biodiversity policy integration or marine biodiversity mainstreaming**

Marine biodiversity policy integration (MBPI) is linked to the concept of Environmental Policy Integration (EPI). EPI emerged in the 1990s as a response to the need to connect the (at the time) incompatible goals of economic competitiveness, social development and environmental protection, while securing sustainable development (Jordan and Lenschow, 2010). It was only in 2009, in the review of the EU Sustainable Development Strategy (EC, 2009b), where EPI scholars stressed out that there was no explicit mention of EPI and instead the term “sustainable development” was used. Hence, EPI still had “room for further clarification” (Jordan and Lenschow, 2010). The need to address interactions between environmental and economic goals through EPI is a common parameter in the various definitions of EPI as demonstrated in Table 1 below.

**Table 1. The need for coordination among economic, societal and environmental goals as a key element of definitions of Environmental Policy Integration**

<i>Reference</i>	<i>Definition</i>
<i>European Environmental Agency</i>	Environmental policy integration (EPI) means including environmental considerations into other policies, with a view to achieving sustainable development.
<i>Lafferty and Hovden (2003)</i>	“its [EPI] ‘mother concept’ – sustainable development – attributed ‘principled priority’ to environmental objectives in the process of ‘balancing’ economic, social and environmental concerns”
<i>Peters (1998)</i>	“coordination that emphasizes comprehensiveness, aggregation and especially consistency”
<i>Collier (1994)</i>	“the search for synergy effects and ‘win-win’ solutions in the making of sectoral policy choices”
<i>Liberatore (1997); Jordan and Lenschow (2010)</i>	“the notion of reciprocity between equally weighed parties or objectives”

The concept of EPI has been further adopted in the cluster of international biodiversity-related conventions. The first generation of these conventions include the Convention on Wetland (Ramsar Convention), The Unesco World Heritage Convention (WHC), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Convention on the Conservation of Migratory Species of Wild Animals (CMS). While initially they were linked to specific conservation agendas centered only on the protection of species and habitats, later they gradually accepted the Convention on Biological Diversity (CBD) approach (Jardin, 2010). As shown in Table 2, the CBD introduced new concepts highlighting the sustainable use of ecosystems (Billé et al., 2010).

**Table 2. Excerpts from the Convention for Biological Diversity and related decisions that address the need for environmental policy integration or mainstreaming of biodiversity (source: Mackelworth et al., 2018)**

Instrument and primary goal	Excerpts exhibiting the need for integration/ mainstreaming
<p><b>Convention for Biological Diversity – CBD (1993)</b>  <i>To protect the Earth's biological resources through the conservation and sustainable use of biodiversity</i></p>	<p>“Develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity by relevant sectoral or cross-sectoral plans, programmes and policies” (Article 6a)</p> <p>“Integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies” (Article 6b)</p> <p>“Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society; reduce the direct pressures on biodiversity and promote sustainable use; improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity; Enhance the benefits to all from biodiversity and ecosystem services; enhance implementation through participatory planning, knowledge management and capacity building” (<b>Aichi Biodiversity Targets</b>)</p> <p>“coordinate at the national level and engage different sectors (including, inter alia, energy, the financial sector, forestry, wildlife management, fisheries, water supply, agriculture, disaster prevention, health, and climate change) to fully account for the value of biodiversity and ecosystem services in decision-making”;</p> <p>“establishing and enforcing management plans; enhancing crosssectoral integration and coordination; improving the operationalization of the definition of sustainable use; improving the understanding and implementation of concepts of adaptive management; and combating unsustainable and unauthorized activities” (UNEP/CBD/COP/DE C/X/32)</p> <p>“to foster, as appropriate, implementation of sustainable consumption and production patterns for the conservation and sustainable use of biodiversity, both in the public and the private</p>

	<p>sector, including through business and biodiversity initiatives, procurement policies that are in line with the objectives of the Convention, and development of methods to promote science based information on biodiversity in consumer and producer decisions” (UNEP/CBD/COP/DEC/X/43)</p> <p>“integrate national action plans for the programme of work into updated national biodiversity strategies and action plans, which (...) should be adopted as policy instruments and used as a primary framework for implementation and as the basis for securing the necessary financial support, including from national budgets and from bilateral, multilateral and other sources Improve (...) coordination and integrating protected areas into wider land- and seascapes, including using protected areas as natural solutions in ecosystem-based approaches to climate change” (UNEP/CBD/COP/DEC/XI/24)</p>
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According to Šumrada et al. (2020) within biodiversity policy analysis and when the focus is specifically on biodiversity protection, concepts similar to environmental policy integration have developed and include “mainstreaming biodiversity” (Huntley and Petersen, 2005; Karlsson-Vinkhuyzen et al., 2017) and “biodiversity policy integration” (Zinngrebe, 2018).

Huntley and Petersen (2005) define the concept of biodiversity mainstreaming as “the integration of biodiversity conservation and sustainable use principles into policies, plans, programs, and production systems where the primary focus has previously been on production, economic activity and development, rather than on biodiversity conservation losses or gains”.

This is further highlighted also by Karlsson-Vinkhuyzen et al. (2017) where they state that “an underlying rationale for promoting a strategy of mainstreaming biodiversity or broader environmental issues is the realisation that the causes of the problem in question lay within the remit of other policy domains or economic sectors”. As such, a sole focus on conservation policies (like in-situ, ex-situ conservation and limiting trade in endangered species) will have only limited impact in reducing biodiversity loss (Karlsson-Vinkhuyzen et al., 2017) and it is in sectors such as agriculture, forestry, fisheries and aquaculture, mining, water management and energy production where the



activities take place that drive biodiversity loss and towards which measures need to be targeted (Spangenberg, 2007).

### **3.3 The necessity of marine biodiversity policy integration into blue economy sectoral policies**

Although biodiversity mainstreaming in economic sectoral policies is of major importance, the existing research on this topic with focus on marine biodiversity is very limited (Diz et al. (2018) examine how the mainstreaming of biodiversity through the integration of Aichi Target 11 qualifiers into SDG 14.5 can strengthen its implementation in a systemic manner). No research was identified on whether and how marine biodiversity policy can be integrated into blue economy sectors or sectoral policies. However the cyclical reporting required for the MSFD does require EU member states to consider the linkages between ecosystem service delivery and blue economy activities and what needs to be done to minimise impact on marine ecosystems by such activities.

The need to consider marine biodiversity issues in BE sectoral policies can be found in some examples as demonstrated below as well as in Table 3 that includes excerpts from international, EU and regional legal instruments that highlight the necessity for integrating biodiversity protection and economic development.

For instance, globally, one of the first big initiatives towards combining economic activities at sea and maintaining healthy oceans was the creation of the United Nations Convention on the Law of the Sea (UNCLOS). UNCLOS is an international treaty adopted and signed in 1982 (which replaced Geneva Conventions of 1958) that englobes areas such as the territorial sea, contiguous zone, the continental shelf, high seas and sectors like fishing and conservation of living resources in the high seas (that are not under any nations rule). UNCLOS became a legal framework for marine and maritime activities and is now often mentioned as the “Constitution of the Sea” (Barnes and Barrett, 2016).

The United Nations’ 2030 Agenda Sustainable Development Goal (SGD) 14 “Life Below Water” can be considered as another important step towards achieving more comprehensive blue growth, encouraging the development of sustainable and resilient coastal communities (Rickels et al., 2019). This SDG’s main goal is to “conserve and sustainably use the oceans, seas and marine resources for sustainable development” (UN, 2021a). However, this SGD 14 has more specific targets: 10 in total, where 7 of them join protection of biodiversity and sustainable use of aquatic resources in the same goal. Some of those targets are: 14.3 that aims at minimizing and addressing the impacts of ocean acidification through enhanced scientific cooperation at all levels; 14.5 which has

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the main objective of conserving at least 10% of coastal and marine areas (pairing with national and international law based on scientific information by 2020; 14.7 that aims to increase the economic benefits to small island states and least developed countries from the sustainable use of marine resources by 2030 (UN, 2021a).

At EU level the Habitats and Birds Directives together with the MSFD served as the environmental pillar of the wider Integrated Maritime Policy (Caddell, 2012) that was initially the advocate of Blue Growth, before the Blue Growth strategy was developed. These three directives were also at the heart of the EU's Ocean Governance agenda (IUCN, 2021b) that attempts to promote sustainable use of the oceans as well. The need to include marine environmental considerations in blue economic development was then addressed as necessary for the achievement of Blue Growth goals in EU's Blue Growth strategy (EC, 2012) which is about coordinating the development of maritime and marine sectors (such as renewables, biotechnology, deep-sea mining, aquaculture and tourism), while assuring the sustainability of the marine resources, in order to “achieve the long-term blue growth”, synchronizing with the MSFD (Rickels et al., 2019). This has been further emphasised with the adoption of the EU Maritime Spatial Planning Directive. Nevertheless, the aim to conserve biodiversity, while ensuring the sustainability of human activities, is also in line with the principles for the establishment of marine protected areas within EU's Natura 2000 network (Tsiafouli et al., 2013). Additionally, both the development of a sustainable Blue Economy and the protection of biodiversity are integral parts of EU's Green Deal (EC, 2019) that aims at transforming the EU into a modern, resource-efficient and competitive economy, by ensuring no net emissions of greenhouse gases by 2050; economic growth decoupled from resource use and that no person and no place are left behind.

Finally, the most recent Communication document on a new approach for a sustainable blue economy in the EU (EC, 2021b) highlights that biodiversity conservation and protection are foundational principles of maritime economic activity and that marine biodiversity can offer multiple benefits as it is not only the prerequisite for economic activities like fisheries, bio-technology and tourism, but it also presents economic opportunities by ensuring the supply of numerous ecosystem services such as blue carbon sequestration, food provisioning and coastal protection, among others.

Finally, biodiversity protection is also one of the challenges for the sustainable economic development at the AA level. According to the latest AAP version (EC, 2020b) “biodiversity is a wealth for the cooperation area that must be preserved. At the cultural heritage it is a vector of attraction and well-being for the territory that must be put to good use to economic activities such as tourism”.

**Table 3. Excerpts from legal instruments that exhibit the necessity of marine biodiversity policy integration into marine sectoral policies at the international the EU and Atlantic Area levels (source: Mackelworth et al., 2018)**

Instrument and primary goal	Excerpts exhibiting the need for integration/ mainstreaming
<p><b>United Nations Convention on the Law of the Sea (UNCLOS)</b>  <i>“Defines the rights and responsibilities of nations with respect to their use of the world’s oceans”</i></p>	<p>“Marine mammals are specifically exempted from the general requirement to promote optimum utilization of living resources within the EEZ and on the high seas.  “States shall cooperate with a view to the conservation of marine mammals and in the case of cetaceans shall in particular work through the appropriate international organizations for (their) conservation, management and study” (Article 61-65)  “The measures taken in accordance with this Part shall include those necessary to protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened or endangered species and other forms of marine life” (Article 194.5)</p>
<p><b>Code of Conduct for Responsible Fisheries UN Food and Agriculture Organization (FAO) (1995)</b>  <i>“Provides principles and standards applicable to the conservation, management and development of all fisheries. It also covers the capture, processing and trade of fish and fishery products, fishing operations, aquaculture, fisheries research and the integration of fisheries into coastal area management. It is voluntary, rather than mandatory”</i></p>	<p>Recognizes the nutritional, economic, social, environmental and cultural importance of fisheries, and the interests of all those concerned with the fishery sector. The Code considers the biological characteristics of the resources and their environment and the interests of consumers and other users.  States should ensure that their fisheries interests, including the need for conservation of the resources, are taken into account in the multiple uses of the coastal zone and are integrated into coastal area management, planning and development</p>
<p><b>Revised Guidelines for the Identification and Designation of Particularly Sensitive Sea Areas (PSSAs) International Maritime Organization (IMO)</b>  <i>“Protection of significant areas which may be vulnerable to damage by international maritime activities”</i></p>	<p>Ecological, socio-economic or scientific criteria for the identification of a PSSA (Article 4)  Vulnerability to impacts from international shipping (Article 5)  Revised Guidelines for the Identification and Designation of PSSAs (Resolution A.982 (24))</p>

<p><b>North East Atlantic Fish Commission - NEAFC convention</b>  <i>“Conservation and exploitation of fish resources”</i></p>	<p>“Objective of long-term conservation of fishery resources, thereby providing environmental benefits along with economic and social ones”</p>
<p><b>Habitats Directive - Council Directive 92/43/EEC</b>  <i>“Conservation on natural habitats and species within the European Union”</i></p>	<p>“the main aim of this Directive is to promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements, this Directive makes a contribution to the general objective of sustainable development; whereas the maintenance of such biodiversity may in certain cases require the maintenance, or indeed the encouragement, of human activities” (Preamble)</p> <p>“identified the need to ‘take account of economic, social and cultural requirements and regional and local characteristics” (Article 2.3)</p>
<p><b>Birds Directive - Directive 2009/147/EC of the European Parliament</b>  <i>“Conservation of wild birds”</i></p>	<p>Requires Member States shall take the requisite measures to maintain the population of the species referred to in Article 1 at a level which corresponds in particular to ecological, scientific and cultural requirements, while taking account of economic and recreational requirements, or to adapt the population of these species to that level (Article 2)</p>
<p><b>Marine Strategy Framework Directive 2008/56/EC</b>  <i>“Promoting sustainable use of the seas and conserving marine ecosystems”</i></p>	<p>Outlines in details the requirements for the assessment of the marine region or subregion based on existing data. This includes the current environmental status, the impacts, including human impacts, cumulative and synergistic effects and socioeconomic analysis of the use of those waters. Analysis will include upstream effects and take into account provisions of the water framework directive. Assessments should be consistent for the region and sub-region and take into account transboundary impacts and features (Article 8)</p> <p>Identification of a programme of measures for Member States to undertake in their region or sub-region to achieve or maintain GES based on the initial assessment outlined in Article 8. Giving due consideration to sustainable development goals and the social and economic impacts of the measures. Programmes shall include spatial protection measures pursuant to the objectives of the</p>

	<p>Habitats and Birds Directives. Member States should consider the implication of their programmes beyond their marine waters (Article 13)</p>
<p><b>Maritime Spatial Planning Directive 2014/85/EU</b>  <i>“To establish a framework for maritime spatial planning aimed at promoting the sustainable growth of maritime economies, the sustainable development of marine areas and the sustainable use of marine resources”</i></p>	<p>Marine and coastal activities are often closely interrelated. In order to promote the sustainable use of maritime space, maritime spatial planning should take into account land-sea interactions. For this reason, maritime spatial planning can play a very useful role in determining orientations related to sustainable and integrated management of human activities at sea, preservation of the living environment, the fragility of coastal ecosystems, erosion and social and economic factors. Maritime spatial planning should aim to integrate the maritime dimension of some coastal uses or activities and their impacts and ultimately allow an integrated and strategic vision (Article 16).</p> <p>Where maritime spatial plans are likely to have significant effects on the environment, they are subject to Directive 2001/42/EC.</p> <p>Where maritime spatial plans include Natura 2000 sites, such an environmental assessment can be combined with the requirements of Article 6 of Directive 92/43/EEC, to avoid duplication (Article 23)</p>
<p><b>Strategic Environmental Assessment Directive 2001/42/EC</b>  <i>“To establish environmental assessment as an important tool for integrating environmental considerations into the preparation and adoption of plans and programmes”</i></p>	<p>The objective of this Directive is to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development, by ensuring that, in accordance with this Directive, an environmental assessment is carried out of certain plans and programmes which are likely to have significant effects on the environment (Article 1)</p> <p>a statement summarising how environmental considerations have been integrated into the plan or programme and how the environmental report prepared pursuant to Article 5, the opinions expressed pursuant to Article 6 and the results of consultations entered into pursuant to Article 7 have been taken into account in accordance with Article 8 and the reasons for choosing the plan or programme as</p>

	<p>adopted, in the light of the other reasonable alternatives dealt with (Article 9)</p>
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### **3.4 State of the art of marine biodiversity policy integration into blue economy sectoral policies in the EU and the Atlantic Area**

In order to understand the level of integration of biodiversity policies into BE policies, sectoral policies in the EU and at the AA level (countries of the AA) must be examined on whether and how they address marine biodiversity loss considerations. The sectors that were examined in the framework of the MOSES project refer to tourism, ports and shipping, marine renewable energy and fisheries and aquaculture.

#### **3.4.1 Marine biodiversity policy integration in marine and coastal tourism policies**

The most recent document that supports the policy for sustainable development of marine and coastal tourism is the European strategy for more growth and jobs in coastal and maritime tourism (EC, 2014b). The strategy specifically identifies that “EU's Natura 2000 network protects vulnerable coastal and marine habitats which, if managed well, can provide significant recreational opportunities and contribute to sustainable growth and employment”. Furthermore, in the EU the communication on tourism and transport in 2020 and beyond (EC, 2020c) underlines the importance of protecting and restoring Europe’s land and marine natural capital while adopting the approach for a sustainable blue and green economy with tourism being one of the BE sectors. The EU has also published a report that provides an overview of the main elements to consider in the promotion and management of tourism and leisure activities in Natura 2000 (both terrestrial and marine) (the N2K Group, 2019), contributing in this way to integrating biodiversity concerns to this BE sector.

Additionally, the EC Guidelines for the establishment of the Natura 2000 network in the marine environment (EC, 2007) suggest some marine touristic activities such as diving, wild fauna watching or different maritime sports and how they can be compatible with the marine Natura 2000 network. Finally, based on the latest version of the AAP (EC, 2020b) “marine and coastal habitats should be preserved and valorised, notably with the view to develop new forms of maritime and coastal tourism. In this particular economic sector, circular economy, zero pollution, energy efficiency and biodiversity preservation should be the guiding principles to develop more sustainable practices that benefit local

development and local employment all over the year”. Based on all these parameters, it can be said that at least at the institutional level, marine biodiversity looks to be integrated in the EU (and hence AA) sectoral policy for tourism.

### **3.4.2 Marine biodiversity policy integration in coastal and marine aquaculture policies**

For aquaculture the most recent document that supports the policy for sustainable development of the aquaculture sector is the Strategic guidelines for a more sustainable and competitive EU aquaculture for the period 2021 to 2030 (EC, 2021a). The guidelines highlight the importance of aquaculture to contribute to SBG not only from the economic perspective, but also from the environmental one as it is a sector that can help to “decarbonise the economy; fight climate change and mitigate its impact; reduce pollution; contribute to better preserving ecosystems (in line with the objectives of the Biodiversity strategy and the Zero pollution ambition for a toxic-free environment) and be part of a more circular management of resources”. The guidelines also point out that it is a method of protein production with a lower carbon and environmental footprint than other types of farming.

Furthermore, certain forms of aquaculture can even offer ecosystem services such as the absorption of excess nutrients and organic matter from the environment or the conservation and restoration of ecosystems and biodiversity. Finally, it is stressed that the (EU and national) regulatory framework for EU aquaculture ensures the mitigation of the impact that aquaculture activities may have on the environment, although aquaculture activities do not significantly harm ecosystems or biodiversity. Additionally, EU Commission guidance documents (such as the Commission staff working document on the application of the Water Framework Directive and the Marine Strategy Framework Directive to aquaculture (EC, 2016a) and the guidance on aquaculture and Natura 2000 (The N2K Group, 2012) clarify the application of biodiversity protection legislation to the aquaculture sector. Based on all these parameters, it can be said that at least at the institutional level, marine biodiversity is integrated in the EU (and hence AA) sectoral policy for Aquaculture.

### **3.4.3 Marine biodiversity policy integration in marine renewable energy policies**

A sustainable ocean energy mix should include (in addition to bottom-fixed offshore wind) floating wind, thermal, wave and tidal energy - emerging technologies that are expected to reach commercial stage within ten years. To speed up their development, in 2020 the Commission published a new EU offshore renewable energy strategy (EC, 2020d) that aims to multiply five-fold the capacity for offshore renewable energy by 2030 and 30-fold by 2050. Other recent documents that support the policy around sustainable development of marine renewable energy are the Communication on Offshore Wind

Energy (EC, 2008b) that addresses the action needed to deliver on the Energy Policy Objectives for 2020 and beyond and the Blue Energy Communication (EC, 2014a), that sets an action plan to deliver on the potential of ocean energy in European seas and oceans by 2020 and beyond. Offshore energy can have some conflicts with biodiversity goals such as those set by the EU Birds and Habitats Directive and the Natura 2000 (Le Lièvre, 2019). Nevertheless, these same conflicts can be drivers for the sustainable development of offshore renewable energy. To accommodate this need, the EU offshore renewable energy strategy underlines that sustainability and, more specifically, the protection of the environment and biodiversity will be key principles for all dimensions concerned. Additional to this, the EC has published an updated guidance on wind energy developments and EU nature legislation (EC, 2020e) that provides information and best practice that will help Member States' competent authorities, developers, consultants and the wind energy industry to ensure that wind energy developments, onshore and offshore, comply with the provisions of the EU Birds and Habitats Directives.

#### **3.4.4 Marine biodiversity policy integration in fisheries**

Regarding fisheries, the most important instrument that addresses the need for sustainable development of the sector with implications to the protection of marine biodiversity is the EU's Common Fisheries Policy (CFP). CFP was reinforced in 2013 with one of the biggest challenges in policy integration: coherence with the European Union's environmental legislation (Ribeiro, 2017). Indeed, within the CFP, dedicated rules apply for the adoption of conservation measures necessary for compliance with Union environmental legislation. These rules are set out in Article 11, "Conservation measures necessary for compliance with obligations under Union environmental legislation" in conjunction with the general provisions of Article 18, "Regional cooperation on conservation measures" Also, the most important goal regarding the protection of marine biodiversity is that member states have to manage fish stocks at maximum sustainable yield by 2020 for all managed stocks. The fight against Illegal, Unreported and Unregulated (IUU) fishing that has detrimental impacts on marine biodiversity and fish stocks within and beyond EU waters also presents major challenges which are addressed by EU's IUU Regulation (EC, 2008c) that promotes sustainable fisheries around the globe. This is also in line with the goals set by FAO and its fight against IUU to provide better quality food (Hildebrand and Bellefontaine, 2017). Many other initiatives exist with regard to the interaction of fisheries and biodiversity protection. For instance, a review of fisheries management measures in Natura 2000 sites with some illustrative examples, was prepared in 2018 (The N2K Group, 2018) and the Staff Working Document on the establishment of conservation measures under CFP for Natura 2000 sites and MSFD-relevant measures (EC, 2018).



### **3.4.5 Marine biodiversity policy integration in maritime transport including ports**

Regarding maritime transportation, the Report on technical and operational measures for more efficient and cleaner maritime transport (EP, 2021) points out that the EU maritime sector should also contribute to tackling biodiversity loss and environmental degradation, and contribute to the objectives of the European Green Deal and 2030 Biodiversity Strategy. However, no further guidance is provided to realise this goal. Environmental sustainability and decarbonisation is one of the areas of focus of the staff Working Document on the implementation of the EU Maritime Transport Strategy 2009-2018 (EC, 2016b). This document however does not make any explicit or implicit mention to the necessity of, or ways to marine biodiversity mainstreaming in this sector. When it comes to ports and harbours though, there is a more thorough guidance.

The EU document “Integrating biodiversity and nature protection into port development” (EC, 2011a) illustrates how nature protection concerns can be integrated into ports policy while reconciling the need for port development and nature conservation. It stresses out that building partnerships between all stakeholders will help reaching the goals of all actors involved. Also the “Guidelines on the implementation of the Birds and Habitats Directives in estuaries and coastal zones with particular attention to port development and dredging” (EC, 2011b), provide a number of recommendations and elements of good practice to enhance port development and management in or near Natura 2000 sites. Nevertheless, the environmental performance of EU maritime transport falls under the same obligations regarding marine and atmospheric pollution by ships set out by IMO through the MARPOL convention (IMO, 2021a) which is the main international convention covering prevention of pollution of the marine environment (including critical habitats, organisms and ecosystems) by ships from operation or accidental causes while also calling for the establishment of particularly sensitive areas (PSSAs) that may be vulnerable to damage by international maritime activities.

### **3.3 Addressing marine biodiversity policy integration into blue economy sectoral policies in countries of the Atlantic Area**

Recent research about the value of the Blue Economy and the transition towards Sustainable Blue Growth in the framework of the Interreg Atlantic project MOSES sheds light on the current state of MBPI in BE policies in the AA. In the AA countries (Ireland, UK, France, Spain, Portugal) that participated in MOSES 85 policy documents in total were identified that have transposed 9 EU legal acts that explicitly or implicitly address the need for marine biodiversity and/or environmental protection. Furthermore, there are an additional 33 national environmental policy documents of which 22 explicitly

address marine issues. However, there was no detailed study of national or local sectoral policy documents on whether they address marine biodiversity protection issues or not.

### **3.3.1 Maritime transport and ports in UK (Northern Ireland)**

The sector that was studied in UK was ports and shipping through a case study about the assessment of SBG in the Belfast Harbour of Northern Ireland. Regarding the environmental aspect of SBG in the Belfast Harbour, strategies such as the Belfast Harbour Strategic Plan 2019-2023 reference sustainable transport and development. The Belfast Green and Blue Infrastructure Plan also considers sustainable principles to address coastal flooding and improve water quality.

Regarding the environmental aspect of SBG in this case study, from the identified environmental challenges that the sector needs to address, those that were also relevant at the regional level are “climate change that requires ports and shipping to decarbonize and seek zero carbon emissions” and the “limited data and research on monitoring and addressing environmental impacts”. Based on interviews, many stakeholders noted that there was a lack of urgency around managing the impacts of climate change and that adaptation was not at the forefront of future/ strategic plans. However, despite climate change being considered a threat, many stakeholders felt that it presented an opportunity for ports and shipping to decarbonise and seek zero carbon emissions instead of a transition to a low carbon future. It was then recommended that fiscal incentives should be made available by port and local authorities to help with the transition to zero carbon emission. Finally, the majority of stakeholders felt that a ‘managed innovation’ approach is necessary to foster resilience and adaptability as well as embracing innovation and technology to flexibly steer long-term change.

### **3.3.2 Maritime and coastal tourism in Ireland**

In Ireland the sector that was studied was marine and coastal tourism because it is highlighted as a key growth sector under the Irish Harnessing our Ocean Wealth Strategy (HOW), Ireland’s Integrated Marine Plan. The case study that was used was the one of the Wild Atlantic Way, a 2500 km coastal touring route along the west coast of Ireland that was showcased as a Blue Growth Pathway for marine tourism and was evaluated against the framework of the EU Commission’s Communication (EC, 2014b) “A European Strategy for more Growth and Jobs in Coastal and Maritime Tourism” and against targets set for the sector in HOW that gives adequate guidance to the sector for methods to achieve SBG.

Regarding the environmental aspect of SBG in this case study, from the identified environmental challenges that the sector needs to address, those that were also relevant

at the regional level are “the increasing impacts on our coasts due to climate change and erosion” and “the need to reduce ecological footprint of tourism businesses”. Both these challenges have implications on marine biodiversity, that need to be studied and addressed in a broader SBG pathway. The case study highlighted that the development of guidelines that support sustainable coastal tourism requires close collaboration at the community level and hence a community-generated collaborative framework was adopted that would help to overcome barriers, maximise opportunities in sustainable coastal tourism and assist in establishing innovations within more sustainable regimes. The need for working collaboratively to identify and respond to environmental damages in line with national-level frameworks and directives was one of the suggestions that would address the environmental aspect of tourism SBG

### **3.3.3 Marine and coastal aquaculture in Portugal**

In Portugal the sector that was studied was aquaculture and its progress towards SBG in the Centro Region. Aquaculture is considered, by the National Ocean Strategy (NOS) 2013-2020, as “one of five strategic domains of preferential intervention for Blue Growth”. NOS is a development strategy for marine and coastal areas that refers to the development model on preservation and sustainable use of the services and resources of marine ecosystems, aiming for a better, inclusive, smart and sustainable economic growth (DGPM, 2014). Based on the national strategic plan for aquaculture one of the priorities for the sector is to be facilitated by better spatial planning to identify areas with higher potential for aquaculture and reduced environmental impact.

Regarding the environmental aspect of SBG in this case study, from the identified environmental challenges that the sector needs to address, those that were also relevant at the regional level are “the risk of introduction of non-indigenous species” and “the need for adaptation to climate change”. Also, stakeholders that were interviewed identified that better spatial planning to identify areas with higher potential for aquaculture and reduced environmental impact is one of the most crucial challenges that the sector is facing. This challenge has been addressed by the publication of various aquaculture plans and the Marine Situation Plan of 2019 that include suggested sites for further (marine) aquaculture development that do not conflict with the marine biodiversity protection priorities. To advance towards these objectives, stronger and more effective collaboration is required between key actors working across the sector at the local, national, and regional level.

### **3.3.3 Marine renewable energy in France**

In France the sector that was studied was offshore renewable energy in Brittany as it is a sector that is promoted by the Multiannual Energy Programme, implemented at state level and because there are plans to increase the capacity for renewable energy in

Brittany. Regarding the environmental aspect of SBG in this case study, from the identified environmental challenges that the sector needs to address, those that were also relevant at the regional level are “the addressing of visual impacts of offshore energy installations and “the difficulty in assessment of trade-offs between environmental benefits from ORE and environmental costs from ORE”. Based on the case study, addressing environmental impacts towards a SBG pathway is a necessity but also a challenge to overcome as avoiding the most important environmental externalities generates high costs. Also choosing floating wind turbines as a more environmentally friendly technology comparing to the fixed wind turbines, adds to this cost as it is a more expensive technology. What is suggested is that in order to verify a sustainable pathway, regular monitoring and evaluation of the economic and environmental impacts would be critical in the short, medium and long term.

### **3.3.3 Sustainable fisheries in Spain**

In Spain a case study approach, involving the Basque fishing fleet, was employed to explore the impact that the fishing activity has on the different ecosystem services considering the sustainability challenges. The study illustrates that both the impact that a fishing activity has on the environment and the sustainability status of the stocks must be considered when SBG is the goal. It must be considered also that, environmental impacts should be assessed at the individual segment level because the impact of each fishing fleet on the marine environment is different, as there are differences in the intensity of each activity, the type of fishing gear used, and the type of ecosystem being affected. Based on this there is not a specific general action that will determine the final value of the pressure on the environment. This type of information must be available and clear to stakeholders involved in ensuring SBG of the fishing sector.

A more detailed review of each of the above summarized MOSES case studies can be found at [http://mosesproject.eu/project\\_outputs/#Reports](http://mosesproject.eu/project_outputs/#Reports)

## **4. A suggested framework towards sustainable blue growth in the Atlantic Area, highlighting the importance of marine biodiversity policy integration**

### **4.1 Existing frameworks to facilitate transition towards sustainable blue growth**

Through the creation and implementation of UNCLOS, it became possible to establish maritime boundaries and national ocean policies (Cicin-Sain et al., 2015) to support autonomous sectors comprising the ocean economy. These sectors and their interactions with each other as well as with the marine environment could lead to

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synergies or conflicts that needed to be identified and managed (Ehler and Douvère, 2009; Kyriazi, 2018). For that purpose, various frameworks to integrate sectoral goals with each other and with marine biodiversity goals have been suggested such as the creation of protected areas such as MPAs with the specific goal of conservation of the existent biodiversity (Edgar et al., 2007) while also considering socio-economic interests; the implementation of political processes that are responsible for the allocation of sea space to meet social, ecological and economic objectives such as integrated coastal zone management and marine (or maritime) spatial planning (Qiu and Jones, 2013), and; ecosystem based management approaches for the oceans (Aburto et al., 2012). In more detail:

- Integrated Coastal Zone Management (ICZM) is a dynamic, multidisciplinary and iterative process to promote sustainable management of coastal zone and seeks to balance environmental, economic, social, cultural and recreational objectives, all within the limits set by natural dynamics. 'Integrated' in ICZM means integration of all relevant policy areas, sectors, and levels of administration as well as integration of the terrestrial and marine components of the target territory, in both time and space (EC, 2002).
- Marine Conservation Planning using Marine Protected Areas (MPAs) which are spatially explicit marine areas that include zonation with various levels of permitted and non-permitted uses within each zone (IUCN, 2021a). In the EU, MPAs are designated as part of Natura 2000 which is a “network of core breeding and resting sites and some rare natural habitats types which are protected in their own right”. This network englobes all of 27 member states, whether it is in land and at sea. The main goal of this network is to guarantee the long term existence of Europe’s valuable and threatened species and habitats.
- Marine Spatial Planning (MSP), as defined by UNESCO, is a “public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic and social objectives that are usually specified through a political process” (Ehler and Douvère, 2009). According to the EUs MSP Directive (EP, 2014) MSP is a tool that allows public authorities and stakeholders to coordinate the marine uses, using science as a base of information for decision-making. Marine spatial planning that integrates biodiversity values is a key instrument that works across economic sectors to achieve the best possible outcomes for biodiversity and society.
- Ecosystem based management (EBM) “is an integrated approach to management that considers the entire ecosystem, including humans. The goal of EBM is to maintain an

ecosystem in a healthy, productive and resilient condition so that it can provide the services humans want and need. EBM differs from current approaches that usually focus on a single species, sector or activity or concern; it considers the cumulative impacts of different sectors” (COMPASS, 2005). According to Long et al. (2015) this is one of the most in-depth, inclusive definitions of EBM.

#### **4.2 A suggested framework towards sustainable blue growth in the Atlantic Area based on marine biodiversity policy Integration**

The above mentioned frameworks exhibit similarities such as the need for inter and intra sectoral cooperation, the need for stakeholder engagement, the need to optimise the use of marine space and resources and the need to incorporate the value of the marine ecosystems when assessing trade-offs between economic, societal and environmental goals. Similar requirements were identified from MOSES case studies as described previously. As such, MPBI can be seen as an approach that is required by all the above suggested frameworks while it is also a necessary element in order to overcome common challenges between BE sectors across countries the AA countries.

These common challenges across sectors and countries as highlighted by the AAP and as identified and examined within MOSES are: reducing the ocean economy carbon footprint, using the sea natural resources sustainably, responding effectively to threats and implementing an ecosystem management approach in Atlantic waters. The MSFD also requires a regional seas assessment of the impacts of economic activity. This was not achieved in the initial assessment by member states and the challenge remains to integrate data on marine industry impacts on the marine environment, and identify which impacts are sustainable, at a regional rather than national basis.

Frameworks that can ensure sustainable blue growth, must be able to address cross-cutting issues in policy-making that transcend the boundaries of established policy fields. This implies developing capacities and policy processes which promote joint reflection, co-creation of knowledge and multi-actor responsiveness across different spatial and jurisdictional frameworks, and across diverse policy departmental and academic disciplinary silos, several sectors and practice communities.

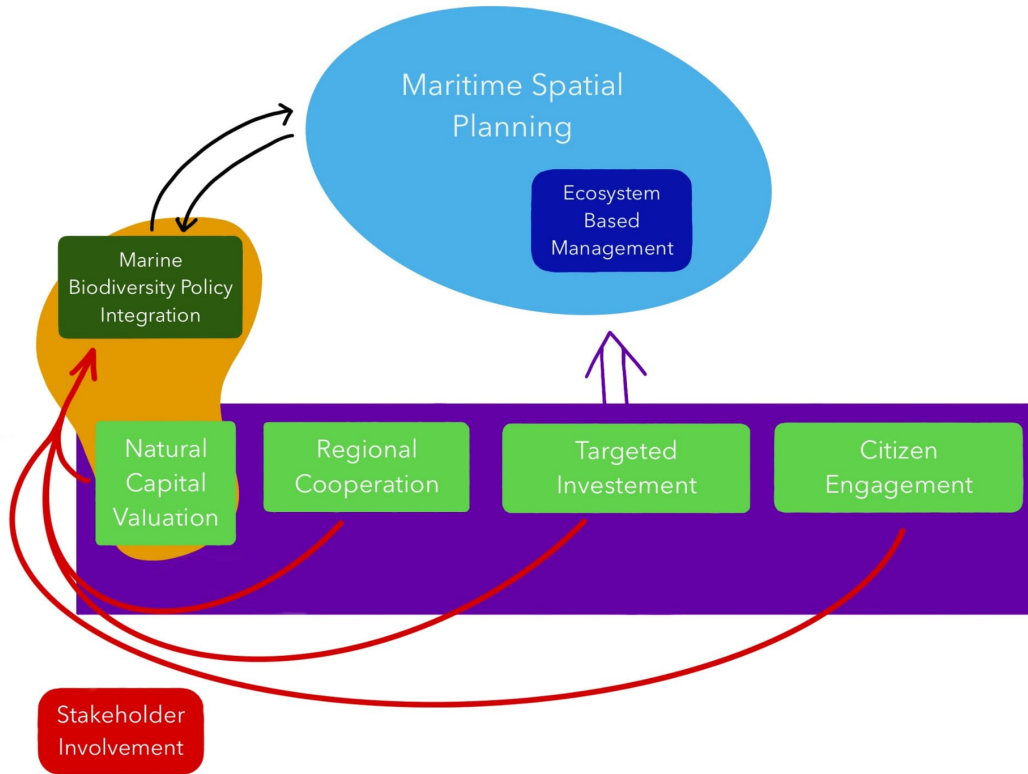
Appropriate frameworks that have these characteristics and can address these common challenges across sectors and countries can be:

- MSP that provides benefits that include reduced sectoral conflicts, a more stable investment environment, the multiple use of space and environmental protection through early identification of impact.

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- EBM that requires managers to analyse and address cumulative impacts of multiple human activities on ecosystems, to understand resulting transboundary effects as well as medium-and long term ecosystem changes, and their knock-on effects on human wellbeing.
- Natural Capital Valuation (NCV) that can facilitate the MBPI that in turn is required by EBM and MSP. NCV is necessary to estimate the contribution of ecosystem health to human wellbeing and to assess trade-offs between economic growth and environmental protection. This action addresses the environmental concerns of SBG.
- Regional cooperation (RC), that can create new markets and support the supply of new innovation to overcome barriers to either new market entrants or the creation of new market niches for goods and services in the blue economy. This action addresses the governance concerns of SBG.
- Targeted investment (TI) and public spending allocated towards forward-thinking ocean research and development that contribute not only to economic growth but also address marine biodiversity loss and climate change. This action addresses the economic concerns of SBG.
- Citizen Engagement (CE) and encouragement of partnerships between practitioners (small and medium-sized enterprises, academia, researchers, public authorities and investors) that are required to co-design and co-implement sustainable blue growth solutions. This action addresses the societal concerns of SBG

There is a hierarchy between these concepts that are linked to each other as shown in the flowchart (figure 1).



**Figure 1. The catalytic role of marine biodiversity policy integration into blue economy policies and practices as part of integrative frameworks that facilitate the achievement of sustainable blue growth in the EU Atlantic Area**

Here MBPI is considered as one of the elements or ingredients of SBG facilitating frameworks (such as MSP and EBM as part of MSP) but with a kind of a special importance in comparison to NCV, RC, TI and CE.

This can be demonstrated by the following:

- There is an interdependency between the successfulness of both MSP (and EBM as part of MSP) and MBPI as it can be said that one encourages the implementation of the other. MSP is a framework that requires MBPI and MBPI is an action that needs to be part of a broader process involving goals beyond the need for sectors to address environmental issues, a fact that makes MBPI an even stronger necessity with a catalytic role. So, it is a goal on its own but also a sub-goal of MSP and EBM.



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- MBPI is an element that depends on a key sub-element, the valuation of marine natural capital and the marine ecosystem services within it. NCV includes the valuation of marine ecosystem services. Nevertheless, the concept of ecosystem services was integrated in the European Commission EU Biodiversity Strategy to 2020 as a mean of mainstreaming biodiversity into other policies, notably agriculture, fisheries, forestry and regional development. It is apparent that Blue Growth strategies in the Atlantic Area would also benefit NCV and hence MBPI.
- Except for NCV, MBPI requires also RC, TI and CE to some extent. The opposite however (i.e. NCV, RC, TI and CE requiring MBPI) is not a necessity.

Such positioning of MBPI corresponds to both approaches to policy integration according to Tosun and Lang (2017) i.e. creation of interdependencies between policy sectors (and consequent coordination between them) and understand that policy integration is mostly a procedural rather than a substantive nature. Also such positioning addresses the need for cooperation between the involved parts from different policy domains or sectors. The policy domains can be seen as a stable coalition of interested parties that have shared interests (Trein, 2017) and in the suggested framework those can be groups that represent economic, societal, environmental and governance interests. Finally, it contains the elements Candel and Biesbroek (2016) suggest that policy integration should be composed of i.e. policy frame, subsystem involvement, policy goals and policy instruments. Policy frame is used to refer to the definition of a dominant problem of societal problems in public policy debates (Baumgartner and Jones (2010); Schön and Rein (1994)). This “definition of the dominant problem” may come from whether and how the problem is interpreted in individual policy subsystems (Candel and Biesbroek, 2016). Here the dominant problem would be the integration of marine biodiversity protection into individual policy subsystems which are the BE sectoral policies that each one of them in turn require NCV, TI CE and RG. Subsystem involvement also depends on how actors and institutions are involved in the governance of a particular policy problem (this problem is what is identified in policy frame). The higher the policy problem is on a political agenda, the greater is the number of the involved subsystems (Peters and Hogwood, 1985). Policy goals, as the name implies, is the adoption of a specific concern, within the policies and strategies of a governance system, including its subsystems, with the goal of addressing this same concern. Policy instruments consists of the substantive and/or procedural policy instruments within a governance system (and subsystems). The substantive instruments assign governing resources of nodality, authority, treasure and organization (Hood, 1986) affects directly “nature types, quantities and distribution of the goods and services provided in society” (Candel and Biesbroek, 2016). The procedural instruments, on the other hand, indirectly affect outcomes through the manipulation of policy processes (Howlett, 2000).

Based on these elements, the suggested framework can be seen as a procedural instrument that requires substantive policy instruments such as recommendations or guidelines to promote and support the realisation of NCV, TI, CE and RG.

## **5. Conclusions**

In the present study the focus has been on the role biodiversity plays in blue economy sectoral development and on the suggestion that proper integration processes are needed so marine biodiversity (protection policies) can be an enabling factor for blue economy development, instead of being an obstacle as it is often seen by the sectors themselves.

In order to make such a suggestion tangible, it is important to analyze the interdependencies between blue economy sectors and the marine ecosystems from various points of view and focus and cultivate those that serve or facilitate better the realization of sustainable blue growth. The different points of view include:

Point 1: A blue economy sector may harm the environment in various ways and this impact must be identified and addressed.

Point 2: A sector may have a positive contribution on the marine environment in various ways, and this type of positive impacts must be identified and must be considered as well

Point 3: Marine ecosystems and the need for protecting can be seen as elements that block economic development.

Point 4: While at the same time these same ecosystems may contribute to economic development through the economic value they produce on their own. Indeed, the protection of marine ecosystems can in and of itself be a blue economy sector. This is because all activities that aim at preserving ecosystems and the services that they provide (such as blue carbon sequestration) may form part of an economic sector in its own right as the “Communication on a new approach for a sustainable blue economy in the EU” (EC, 2021b) suggests.

As demonstrated in previous sections of this study, until recently, biodiversity protection policies (and the institutional frameworks that support them) have focused more on the negative impacts that some economic sectors may have on the marine ecosystems (Point 1 above) and on how they must be addressed. In parallel, economic sectoral policies and supporting institutional frameworks that support them, most frequently focus (when it comes to address their interaction with the marine

environment and ecosystems within it) on the why and the how to address their negative impact.

Recently though, there has been a shift in policies at international, regional and national levels from a pessimistic approach of the bad economic sectors that harm the environment, to a more optimistic and organic approach that sectors can also have positive environmental externalities (Point 2 above) and that the protection of marine ecosystems can be a sector of the economy that provides natural capital (Point 4 above) and can play an active role in planning for economic development; a “sector” though, that does not create negative impacts as those other types of economic sectors may do (Kyriazi et al., 2013). So, for an increasing number of scholars and policy makers (the value of) marine ecosystems are the epitome of SBG (see natural capital valuation, marine ecosystem services and nature based solutions and their links to SBG for example (Gacutan et al. (2019); Lillebø et al. (2017); Mustafa et al. (2019))

The integration process suggested here and visualized by the suggested framework, where marine biodiversity policy integration has a central position in the achievement of SBG (especially based on the needs of the AA) departs from this approach and these points of view. Based on this framework, the key elements that facilitate MBPI are those that are needed also for SBG. These key elements are NCV, TI, CE and RC.

For instance, the importance of NCV for ensuring SBG was exhibited by the EU Biodiversity Strategy which has incorporated the concept of ecosystem services as a means of mainstreaming biodiversity into other policies. As such, action 5, target 2, suggest member states to “map and assess the state and economic value of ecosystems and their services in the entire EU territory and promote the recognition of their economic worth into accounting and reporting systems across Europe” (EC, 2020a). Natural capital accounting systems use the ecosystem service framework concept, but with accounting terminology to facilitate inclusion of ecosystem values in national accounts (Austen et al., 2019). Then a targeted investment in relevance to MBPI could be investments in marine protected areas, in particular strictly protected areas, that have shown to generate rich economic return and multiply the amount of fish and marine life where protection is effective (EC, 2021b). Then, citizens’ engagement is necessary in the sense that the ocean is a global commons and all citizens should have a view on how their nation’s EEZ should be managed for the benefit of current and future generations (Bramley et al., 2021). In this context, all interests must be reflected in order to prevent the possibility of potential disparities and inequalities between stakeholders, whereas citizens are stakeholders too. For this reason, the potential for citizen science must be considered for the generation of data and for promoting active public participation. Also, citizen engagement is important in accessing the value of ecosystems and their co-management, in monitoring coastal habitat quality and in

communicating identified challenges linked to SBG. Finally, intercountry and intersectoral regional cooperation is fundamental for identifying common biodiversity protection priorities and creating common standards and requirements for marine natural capital valuation and marine biodiversity policy integration and hence assist in the achievement of mutually beneficial goals and win-win solutions for all EU AA Member States.

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