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Three Scandinavian Countries in the Baltic Sea: A Critical Study of the Blue Economy Programmes

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ABSTRACT

This paper examines the current state of the Blue Economy in the Baltic Sea region, with a focus on sustainable development in the Scandinavian countries. The paper begins by providing an overview of the economic, social, and environmental impacts. The paper identifies key challenges facing the industry in the Scandinavian countries, including the need for better planning and management, the preservation of natural and cultural heritage, and the protection of the marine environment. This research aims to explain the urgency of Blue Economy activities impact in the Baltic Sea, specifically the impact on the environment and communities in Scandinavian Countries. To analyze the implementation of the blue economy in Scandinavian countries based on the EU Blue Economy. Using intergovernmental theory to explain the urgency and to explain the multi-level interaction between Scandinavian countries to achieve common goals. To understand complex social phenomenon researcher used qualitative research method that involves collecting and analyzing non-numerical data. In conclusion, the paper argues that sustainable blue economy in the Scandinavian countries bordering the Baltic Sea can bring significant benefits to both the marine industry and the wider community, but only if it is managed in a responsibly and sustainably manner. The paper concludes by calling for greater collaboration between stakeholders to ensure that the blue economy in the region is developed in a way that is both sustainable and inclusive, and that respects the natural and cultural heritage of the region.

Keywords: Baltic Sea, Blue Economy Programmes, European Union, Scandinavian countries, Sustainable Development

1. Introduction

The interconnected challenges of climate change, biodiversity loss, rising pollution, and waste form a significant "triple crisis" that compels us to reconsider our utilization and management of natural resources. Moreover, recent events like the pandemic, the UkraineRussia conflict, and shifts in the geopolitical landscape are also reshaping global value chains, as well as food and energy production (Barques, 2023).

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The Baltic Sea, bordered by nine countries, represents a prime example of a region rich in marine resources, cultural heritage, and economic activities. It provides a natural transport route for trade and travel in centuries for Scandinavia Country (Nordic Innovation, 2021). The concept of the Blue Economy, European Commission (EC) defines it as “All Economic activities related to oceans, seas, and coasts. It covers a wide range of interlinked establishment and emerging sectors” (UN, 2023). It emphasizes the sustainable utilization of ocean resources, and offers a promising framework for unlocking the economic potential of the Baltic Sea while safeguarding its fragile ecosystems (Biuksane, 2022).

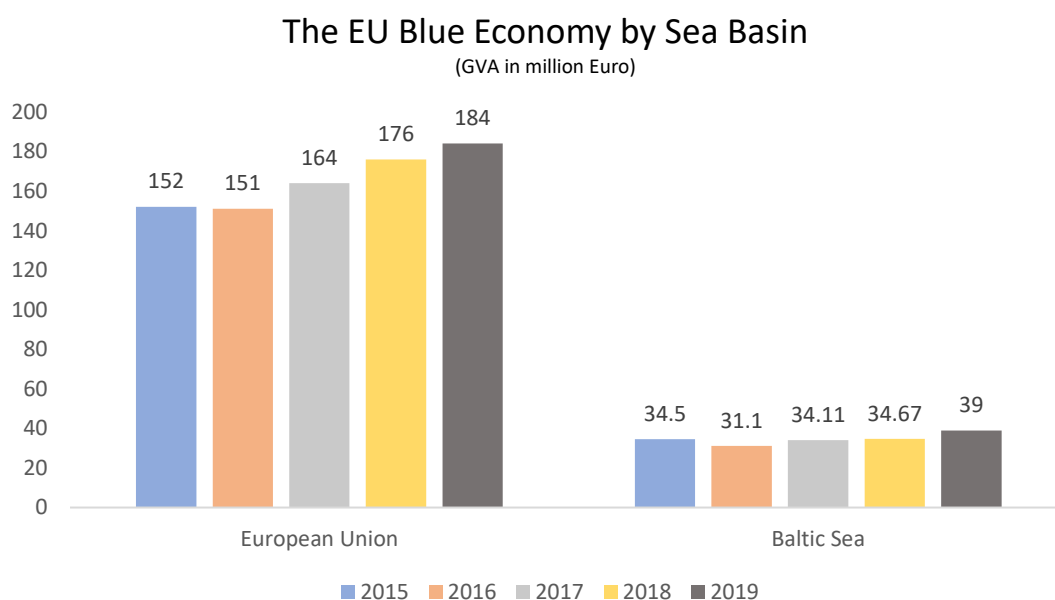


Figure 1. Baltic Sea blue economy GVA

In Baltic Sea Region (BSR), according to the EU’s Blue Economy Report 2022, the Baltic Sea provided 21,2% gross value added (GVA) in the European Union (EU) with almost 40 billion euro in 2019. On the other hand, the Baltic Sea provide 16% employment in 2019 with around 700 thousand employees. Short-sea shipping generated the largest GVA. The highest share of employment was among the sectors for coastal tourism and fish for human consumption. In terms of GVA, maritime transport is the most important sector with 13 billion euro in 2019 (EC, 2022).

To explore the Blue Economy in the Baltic Sea Region (BSR), it is essential to consider the unique characteristics and dynamics of this specific ecosystem. The Baltic Sea presents abundant opportunities, such as the development of sustainable fisheries and aquaculture, marine

tourism, offshore renewable energy, and the promotion of eco-innovation and blue biotechnology. However, BSR faces a range of challenges, including pollution, eutrophication, overfishing, and climate change impacts. These factors pose threats to both the environment and the socio-economic well-being of coastal communities.

This paper provides a comprehensive understanding of the Blue Economy in the Baltic Sea Region, examining its various sectors, the challenges that need to be addressed, and the opportunities that can be harnessed to drive sustainable development

2. Literature Review

"Blue Economy in the EU-27," was authored by Inese Biuksane in 2022. This study elucidates that the blue economy can facilitate sustainable economic development and make a significant contribution to environmental and climate conservation. The blue economy is characterized by a high potential for innovation and growth, enabling sustainable development for countries and the preservation of natural resources for future generations. The research aims to assess the development of the blue economy in the EU. A socio-economic assessment of blue economy sectors in the EU was conducted, and the growth potential of the blue economy. The reflected information can be used in decision-making processes to formulate, implement, and plan joint blue economy policies.

"Assessing the Balance Between Nature and People in European Seas: Maritime Spatial Planning in the Baltic Assessment Report," authored by Jochen Lamp and Lisa Baumgartel, discusses the steps taken in establishing MSP across the entire Baltic Sea region and the delivery of maritime spatial plans, at least close to the established deadline.

3. Research Methodology

To build a sustainable Blue Economy in the Baltic Sea Region, effective governance mechanisms and international cooperation play a crucial role. Collaborative efforts among the Baltic Sea countries, regional organizations, and stakeholders are essential for the development of integrated policies, management frameworks, and investment strategies.

Stanley Hoffmann analysed there are four points to view about intergovernmental. The first issue is a nation-state, the main actor in the integration process and world politics as a whole that Hoffmann describes as a "form of social organization" where government, as the highest authority eligible for legitimate use of force within its subject territory, manages national

community through laws and norms based on common values and which has public support for the policy it pursues (Syssoyeve, 2018).

The second issue is international circumstances, the arena where nation-states interact, such as world trade, collective security, space study, financial markets, etc., where states and other global actors bargain, compete and cooperate. The third point is an internal condition for integration. This means the country decides to unify with other communities in this case with other countries. Also, the country needs support by political support and public support. The last point is external conditions, which is the potential member states should have a similar value (Syssoyeve, 2018).

With this understanding, intergovernmental refers to a mode of cooperation among sovereign states, where governments represent their respective national interests and engage in negotiations and decision-making processes. It emphasizes the role of states as key actors in international affairs, with each state participating as an autonomous entity. In intergovernmentalism, governments interact directly with one another, negotiating and reaching agreements on various issues, without necessarily surrendering their sovereignty or delegating decision-making authority to supranational institutions (Cini & Borragan, 2019).

In this context, the European Union (EU) provides a notable example of intergovernmentalism. The EU is a supranational organization composed of member states that have agreed to cooperate on various issues such as trade, security, and economic integration. However, the EU's decision-making process often involves intergovernmental negotiations, where member states' governments retain significant decision-making power. This approach contrasts with a more federalist model, where supranational institutions have greater authority and autonomy.

This study will use a qualitative approach. This research uses secondary data sources obtained from observations and literature searches that discuss the blue economy in the Baltic Sea. The literature in this paper is based on previous studies found in various journals, books, official documents, government documents, and international organization reports.

4. Result

Policymakers worldwide are increasingly focusing on the ocean and various water-related sectors, commonly referred to as "blue" sectors, to diversify economies, achieve climate objectives, and support local communities. The transition towards a blue economy carries

significant expectations, but it is also accompanied by uncertainties. It is imperative to prioritize sustainability as a central aspect of any transformation (Barques, 2023).

There are different interpretations of the blue economy. According to the World Bank, the blue economy is the "sustainable use of ocean resources for economic growth, improved livelihoods, and jobs while preserving the health of the ocean ecosystem" (World Bank, 2017). While United Nations itself defined the Blue Economy as an economy that "comprises a range of economic sectors and related policies that together determine whether the use of ocean resources is sustainable (UN, 2023).

Blue Economy in BSR including established sectors and emerging sectors. Established sectors contain marine living resources, marine non-living resources, marine renewable energy, port activities, shipbuilding and repair, maritime transport, and coastal tourism (EC, 2022).

Each sector is further broken down into sub-sector. The sub-sector for marine living resources includes primary production, processing of fish products and distribution of fish products. Although marine non-living resources sub-sector includes oil and gas. The marine renewable energy sub-sector consists of offshore wind energy. The port activities sub-sector includes cargo and warehousing port and water projects. Sub-sector for shipbuilding and repair encompasses shipbuilding and equipment and machinery for ships. Maritime transport has subsector such as passenger transport and freight transport services for transport. Lastly, the coastal tourism sub-sector includes accommodation, transport, and other expenditure (EC, 2022).

While the emerging sectors cover, blue bio-economy and biotechnology, marine minerals, ocean energy, and infrastructure (EC, 2022). The sub-sector for the emerging sector contains more than the established sector. Blue bioeconomy and biotechnology covers, algae sector development and offshore aquaculture. Marine mineral contains other minerals and metals and chemical elements dissolved in seawater. Sub-sector for ocean energy consists of floating offshore wind, wave and tidal energy, floating solar energy, and offshore hydrogen. For infrastructure sub-sector involves submarine cables, maritime technology such as robotics, underwater drones, and airborne drones. Emerging sectors also include maritime defence, security and surveillance, research on emerging topics, skill development, and desalination (EC, 2022).

Maritime Spatial Planning (MSP) is a tool which supports a sustainable blue economy, it is also a tool for regional, transnational, and cross-sectoral cooperation (Pontynen, 2022). European

Union (EU) MSP directive was adopted in 2014 (EC,2014b). MSP directive is intended to support the utilization of maritime economy potential while ensuring long-term sustainability. The MSP was not only used by the EU, but also WWF adopted the MSP directive by the EU to release a report for MSP in BSR.

Taking a sustainable and ecosystem-based approach (EBA) to planning and managing the use of the world ocean has one of WWF’s missions. In 2022, WWF released an MSP report for BSR countries, this paper will focus on three Scandinavia Countries not all countries in BSR. This report contains four categories, which are the inclusion of nature, socio-economic considerations, good ocean governance, and comprehensiveness of the complete MSP process (WWF, 2022a).

The inclusion of Nature can be described as a fundamental part of achieving a sustainable blue economy, a plan encompasses the incorporation of marine conservation, constraints on the growth of activities conducted at sea, and the recognition of the combined consequences of human activities on the capacity of marine ecosystems. These integral elements are essential for ensuring the long-term sustainability and preservation of the marine environment (WWF, 2022a).

The indicators used to measure The Inclusion of Nature, such as directive requirements, relevant elements of ecosystem-based management, aspects of marine nature conservation, blue corridors, identification of sensitive areas and recent approaches for re-establishing ocean resilience (WWF, 2022b).

Table 1. Inclusion of Nature

Category Average	Inclusion of Nature
Baltic Average	43,40%
Denmark	16,70%
Finland	29,60%
Sweden	70,40%

The average score for nine Baltic Countries is 43%. While Denmark, Finland, and Sweden had 17%, 30%, and 70% respectively. Two countries from Scandinavia scored below average, this is

homework for both countries to fulfil important criteria to MSP, including activities such as conducting Strategic Environmental Assessment (SEA), translating the precautionary principle, incorporating land-sea interactions in planning, and ensuring network connectivity as well as completely leaving areas for restoration and protecting blue carbon out of focus. Meanwhile, Sweden scored 70%, in this category is their inclusion of Marine Protected Areas (MPA) with 30% protected area, which is a big gap with other countries.

Socio-economic consideration can be known as a plan that considers a wide range of human activities at sea and various socio-economic factors, which encompass the principles outlined for achieving a sustainable blue economy (WWF, 2022a). In this indicator, seven categories were assessed including the integration of different sectors of marine uses, ecosystem services, maritime spatial plans such as mitigation, resolution of conflicts, nature conservation, also income and employment in the coastal area (WWF, 2022b).

Table 2. Socio-Economic Indicators

Category Average	Socio-Economic Indicators
Baltic Average	54,00%
Denmark	28,60%
Finland	28,60%
Sweden	85,70%

Socio-economic consideration on the Baltic Sea scale, this category score highest among other categories with a 54% average. Sweden came in with 86%, while Finland and Denmark has the same score with 28,6%. In recent years EU capacity building project in MSP to support has had an impact on all Baltic Sea countries for this category. Overall, all countries has a good score in offshore renewable energy development, sea uses by fisheries, profiting from innovative application of ecosystem service, job, and income (WWF, 2022b). Sweden, actively in the MSP development project and manage to transfer knowledge into the development of maritime spatial.

In Finland's case, socio-economic considerations, although assessments have been conducted, they have not been effectively utilized to resolve conflicts or provide guidance on prioritizing

conflicting sea uses or functions. This is primarily because the plan is assumed to have no direct impact at all. While Denmark has an issue with a binding plan and conflicts with the uses of mineral extraction, fisheries, and offshore renewable energy in the follow-up permission or licensing procedure.

Good Ocean Governance can be explained as a plan in line with other EU policies and appoints competent authorities responsible for overseeing and ensuring the effective implementation of a high-quality EBA to MSP (WWF, 2022a). There are nine indicators that can be divided into three groups. The first group’s focus on maritime spatial planning contributes to the fulfilment of EU policies and to reaching a Good Environmental Status (GES) of the sea. The second one is to examine aspects underlying the maritime spatial plan, such as long-term vision and reserved future uncertain developments. The last group looks at crucial factors that can affect the implementation of a plan, including the designation of the plan and administration for planning and implementation (WWF, 2022b)

Table 3. Good Ocean Governance

Category Average	Good Ocean Governance
Baltic Average	46,90%
Denmark	38,90%
Finland	38,90%
Sweden	55,60%

The good ocean governance category average score is around 47%. Sweden scores 56% above average, however Denmark and Finland score again below average with 39% and 28% respectively. Sweden scored a good rating since all their policies align with EU policies, including seafloor and habitat protection and applied for GES. On the positive side, all countries have a mechanism and agencies for a mandate to handle complex issues of MSP. Also, all the countries have a formulation for a long-term vision for future development.

The last category, comprehensiveness of the complete MSP process define as a process of Maritime Spatial Planning (MSP) relies on the effective management of all maritime activities, which includes fostering transboundary collaboration among national authorities to achieve

long-term sustainability. Additionally, it adopts an adaptive approach to monitoring and future planning to ensure continual adjustment and improvement (WWF, 2022a).

The comprehensiveness of the complete MSP process has eight categories. The indicator summarizes the extent to which comprehensive data is utilized, as well as the inclusion of various marine economic sectors and functions. This encompasses aspects such as cross-border cooperation, interdisciplinary approaches, adaptability in planning, assessment, and monitoring of MSP, and the coverage of the sea area. It measures whether the MSP fully cover the sea area or is adjacent to other country or region. In Sweden and Finland for example the sea planning is in the competence of municipal bodies or regions (WWF, 2022b).

Table 4. Comprehensiveness of the Complete MSP Process

Category Average	Comprehensiveness of the Complete MSP Process
Baltic Average	50,70%
Denmark	37,50%
Finland	37,50%
Sweden	68,80%

The average score for Baltic-wide is around 51%. The Scandinavian country scores are 69% for Sweden and 38% for both Finland and Denmark. The use of temporal regulations is still rare among the maritime spatial plans assessed. Many countries have designated large “general use zones” which can be translated as “multiuse”, when, in fact, they just allow current uses to continue unrestricted. It is a positive sign that Sweden has to utilize a broad knowledge base, involving interdisciplinary, while in contrast Denmark and Finland have a future task to compile for the requirement of the MSP directive.

5. Discussion

THE BSR supports unique ecosystems but is severely affected by general threats like biodiversity loss and climate change and by specific local pressures such as eutrophication, overfishing, elevated levels of contaminants such as pharmaceuticals, and litter, in particular plastic waste. Production and consumption place the health of the ocean at risk. The pressure from commercial fishing, increase litter and plastics pollution, shipping and leisure boating, and

ecological changes through climate change. This impacts the well-being of people and coastal communities and the economy itself. While each country has a different problem but almost the same one and another.

Denmark's ocean economy in ocean transport has a significant impact such as shipbrokers, ports and logistics companies, shipyards and industrial and service companies that supply equipment, components, and service to ships (Sepponen et al, 2022). Shipping is the largest export industry in Denmark with 20% of export coming from this. In ocean energy, Denmark is a pioneer for offshore wind with huge investment. Coastal tourism forms a significant part of Danish tourism and hospitality. Danish Coastal and Nature Tourism, working to maintain and increase the competitiveness and sustainable growth of Danish tourism in the increasingly competitive market through a common agenda and action plans (Sepponen et al, 2022).

Challenges came from the stagnancy of seaports since 2009, despite the rising investments. Furthermore the stakeholder involvement and future growth potential is bad across the board. Also, Denmark can be struck by climate change damages. The total public expenditure for environmental protection only increased by 5% between 2009 (Faber & Lagemann, 2021). Denmark's strategy for their industry is focused on increasing sustainability aquaculture, protecting biodiversity affected by their industry, and environmental monitoring.

However, Denmark is a host for various emerging ocean industries. The development of emerging ocean industries and seafood cultivation with more than 300 members from the food value chain, research and public actors that develop the project (Sepponen et al, 2022). Another opportunity for Denmark came from The City Board of Holbaek which has approved a harbour development plan (Faber & Lagemann, 2021). Improving coastal tourism for key destinations alongside future offshore locations in the sea is the main opportunity for Denmark.

Finland's ocean transport is important for the Finnish. About 90% of exports and imports came from the sea. Passenger ships are used to transport goods too especially from and to Sweden and Estonia. Ocean transport including the shipbuilding industry, transport and ports contribute around 14 billion euro in 2019 (Sepponen et al, 2022). For ocean energy there are start-up companies in this field, however, this sector is not large and mainly comprises wind energy. In the tourism industry, there is little focus on it, although a significant share is targeted.

While ocean food in Finland including fisheries and aquaculture are important in development and innovation although it is not as big as ocean transport (Sepponen et al, 2022).

Finnish face a real challenge to achieve a blue economy. Mostly problems with the environment such as decarbonisation from Finnish industry connect to the ocean. The industry includes marine production, developing sustainable aquaculture, recreational use of marine areas, and export of ocean energy. The dilemma for the Finnish while their port is 90% used for trade, on the other hand, it can pollute their water. The policymakers need to think about it to improve the environment friendly but not limit the industry in the sea too.

The Finnish government has a policy goal focusing on four sector areas, the maritime cluster, maritime logistics, marine production, and protection of the seas. Protection of the seas is connected with another focus area, while maritime logistics are key to Finland's economy and business in maritime shipping. These opportunities for Finland will improve the development of the maritime cluster to level the operational environment internationally, encouraging innovation, and ensuring the availability of a competent workforce and technologies (Sepponen et al, 2022). And can improve the national plan for MSP to fully cover the coastal sea areas (WWF, 2022a).

Sweden's extensive coastline, lakes, and waterways, combined with a strong innovation ecosystem, offer prospects for enhanced self-reliance, competitiveness, job creation, and international appeal. Across various marine sectors, there is a growing trend of developing and innovating new businesses, and products and fostering cross-sector alliances and partnerships. However, achieving a sustainable blue economy necessitates a systems approach that encompasses not only economic growth but also social and ecological sustainability as essential prerequisites (Barques, 2023).

Challenges and opportunities in Sweden are not much different from those Denmark and Finland. Swedish main problem is the future health of nature while it can provide resources and services along their coastline. The economic growth and job creation provided by their sea demands a sustainable solution for their opportunities without forgetting about nature. The BSR has been important for Sweden for their economic development through the food supply, transport and trade (Barques, 2023). Since fish farming is still a small industry it can be improved since it is still a growing industry in Sweden.

However, several opportunities await Sweden. To improve and develop technology in sustainable food supply including increased aquaculture production and diversified seafood production and consumption. Energy planning including offshore wind and wave energy. Resilient coastal governance to continue the increase of coastal tourism based on nature

experience. Transport mobility contains more sustainable and renewable energy transport for the commercial ship.

Based on the explanation above there are several recommendations:

1. Sub-regional Coordination among Scandinavian Country
 - a. State and other national stakeholders such as communities, institutions, researchers and public actors, and other related actors take more active planning and coordinating in MSP to gain Blue Economy in each country also the policymakers can make it in the region.
 - b. Transboundary cooperation in sub-regional together decrease the impact from activities in BSR and improves the impact of local communities such as job creation and employment in coastal communities.
 - c. International collaboration is required to develop indicators that will facilitate management in marine ecosystems used by multiple countries, especially in countries sharing borders to cooperate. Even though the problem did not come from their country instead.
2. Increase innovation and research
 - a. Research cross-sectoral studies on biodiversity, ecosystems, climate, socioeconomic and politics play a crucial role in informing marine spatial planning processes. It is important to consider various aspects such as public acceptance of offshore energy, tourism patterns and their impact on marine services, and citizen observations to gather comprehensive data. Additionally, conducting cross-sectoral research can contribute to enhancing ocean literacy and understanding.
 - b. Improve knowledge exchange, so every country needs similar information, particularly for the upcoming industries, such as energy, mineral extraction, new types of marine foods, etc. While networks at different levels have been useful to bring actors together and discuss common challenges.
 - c. Improve open data sharing and accessibility about projects and innovation to boost every country's needs. For example sharing data about the development in offshore energy,

with that every country can work together to build the best product with no harmful impact to nature.

3. Recommendations related to the environment

- a. Setting a goal for net-zero emissions from maritime transport, since every country depends on ocean transport. Not only from climate impact but also emissions that pollute the water. Such as from shipping for trade, the ports, logistics, and other industries related to it.
- b. Connect the ecosystem with legislation for domestic law that is related to Blue Economy to reduce the activities that damage nature. Also, apply adaptive management tools to continuously evolve national MSP. Stakeholders must be involved in international and domestic aspects.
- c. Increase self-sufficiency, such as diversifying blue food and the use of biomass beyond fisheries in the aquaculture industry for production. The nature damage by coastal tourism and the mineral resource industry potentially can damage the ecosystem and biodiversity in BSR.

By implementing these recommendations, the countries in the Baltic Sea Region can work together to foster sustainable development, protect the environment, and promote the growth of the Blue Economy.

6. Conclusion

In conclusion, the concept of the blue economy is gaining global attention as policymakers recognize its potential to diversify economies, support local communities, and contribute to climate objectives. However, it is crucial to prioritize sustainability throughout the transformation process. The European Union (EU) and the Baltic Sea Region (BSR) have established sectors and emerging sectors within the blue economy. These sectors cover a wide range of activities, including marine living resources, renewable energy, port activities, tourism, blue bio-economy, marine minerals, ocean energy, and infrastructure. Maritime Spatial Planning (MSP) is a tool that supports the sustainable development of the blue economy and promotes regional and cross-sectoral cooperation. The MSP process should incorporate considerations such as nature conservation, socio-economic factors, good ocean governance, and comprehensive planning. While progress has been made in the BSR countries, some areas that

require attention and improvement, such as the inclusion of nature conservation, resolving conflicts, and ensuring comprehensive and adaptive planning. Overall, a sustainable blue economy in the BSR requires concerted efforts to balance economic growth with environmental preservation and social well-being. Conclusion about Blue Economy in general mentions challenges and opportunities in each country and what should every country work together to achieve sustainable development in BSR.

The BSR faces significant challenges and opportunities in the pursuit of a sustainable blue economy. The region's unique ecosystems are under threat from biodiversity loss, climate change, eutrophication, overfishing, pollution, and plastic waste. These pressures have a detrimental impact on the well-being of coastal communities and the overall economy. Denmark, Finland, and Sweden each have their own specific challenges and opportunities within the blue economy.

Denmark's ocean economy is heavily reliant on shipping, offshore wind energy, and coastal tourism. Challenges include stagnancy in seaport development, stakeholder involvement, and vulnerability to climate change. Finland relies heavily on ocean transport, with 90% of exports and imports being transported by sea. Challenges include the decarbonization of the industry and the need to balance economic growth with environmental sustainability. Sweden benefits from its extensive coastline and waterways and has a strong innovation ecosystem. Challenges in Sweden include ensuring the future health of nature while supporting economic growth and job creation. Opportunities lie in sustainable food supply, energy planning (such as offshore wind and wave energy), resilient coastal governance, and sustainable transport solutions.

Enhance coordination and planning in Maritime Spatial Planning (MSP) at the national and regional levels to promote the development of the Blue Economy in each country. Encourage international collaboration and cooperation, particularly among countries sharing borders, to develop indicators and management approaches that address shared challenges and promote sustainable practices even when the problems originate outside their own country. By implementing these recommendations, the countries in the BSR can work together to foster sustainable development, protect the environment, and promote the growth of the Blue Economy.

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