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How can maritime spatial planning contribute to sustainable Blue Growth in the Baltic Sea?

W jaki sposób morskie planowanie przestrzenne może przyczynić się do zrównoważonego niebieskiego wzrostu Morza Bałtyckiego?

Authors' Contribution:
A – Study Design
B – Data Collection
C – Statistical Analysis
D – Data Interpretation
E – Manuscript Preparation
F – Literature Search
G – Funds Collection

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Abstract: The sea and the coasts are drivers of Europe's economy as many of the economic activities as well as large part of trade depend on the sea. At the European level there is strong political pressure to enhance the growth of maritime economy sectors. The European Union has developed the Integrated Maritime Policy to support the sustainable development of the seas and oceans. The aim is to reach a good environmental status of European seas by 2020.

The value of this study is to provide fresh insight into the topic by examining the empirical relationship between the sustainable Blue Growth and Marine Spatial planning. The purpose is to make a relatively short introduction to questions like what is the potential of sustainable Blue Growth, how can maritime spatial planning (MSP) contribute to sustainable Blue Growth, and what are the cross-border elements of MSP. The experiences of previous MSP projects, EU policy reports and scientific articles with MSP in their focus are used as a source to answer these questions. So far there have been only recommendations towards sustainable Blue Growth, and each country remains responsible for designing and determining the format and content of maritime plans. MSP processes should be developed both at national and international levels.

Keywords: Maritime spatial planning, blue growth, The Baltic Sea

Streszczenie: PMorze i wybrzeża napędzają europejską gospodarkę, ponieważ zależy od nich wiele działań gospodarczych oraz znaczna część handlu. Na poziomie europejskim wywierane są znaczne polityczne naciski na rozwój sektorów gospodarki morskiej. Unia Europejska stworzyła zintegrowaną politykę morską, aby wspierać zrównoważony rozwój mórz i oceanów. Jej celem jest osiągnięcie dobrego stanu środowiska morskiego w Europie do 2020 r.

O wartości niniejszego badania stanowi przedstawienie świeżego spojrzenia na ten temat, poprzez przyjrzenie się empirycznemu związkowi zrównoważonego niebieskiego wzrostu z morskim planowaniem przestrzennym. W artykule zawarto krótkie wprowadzenie do takich kwestii, jak potencjał zrównoważonego niebieskiego wzrostu, przyczynianie się morskiego planowania przestrzennego do zrównoważonego niebieskiego wzrostu, oraz ponadnarodowe elementy morskiego planowania przestrzennego. Autorzy skorzystali przy tym z takich źródeł, jak informacje o poprzednich projektach morskiego planowania przestrzennego, raporty o polityce UE oraz artykuły naukowe poświęcone morskiemu planowaniu przestrzennemu. Dotychczas sformułowano jedynie zalecenia na temat zrównoważonego niebieskiego wzrostu, a każde państwo jest odpowiedzialne we własnym zakresie za projektowanie i określanie formy i treści planów morskich. Procesy morskiego planowania przestrzennego należy rozwijać zarówno na poziomie krajowym, jak i międzynarodowym.

Słowa kluczowe: Morskie planowanie przestrzenne, niebieski wzrost, Morze Bałtyckie

Introduction

The importance of marine areas to the regional development has not been fully understood [1]. The factors like technological progress in working offshore in ever-deeper waters, rising awareness of land and freshwater being finite resources and the need to reduce greenhouse gas emissions are challenging the existing structure of maritime economy and offering new sources of innovation and growth.

At the European level there is strong political pressure to enhance the growth of maritime economy sectors. According to the European Commission's Blue Growth initiative [2] there is "significant potential in Europe's oceans, seas and coasts" and when provided the appropriate investments and research, the maritime sectors "can contribute to the EU's international competitiveness, job creation and new sources of growth whilst safeguarding biodiversity and protecting the marine environment". The high and rapidly increasing demand for maritime space for different purposes has raised the question of integrated planning and management of the seas.

In this regard, the European Union has developed the *Integrated Maritime Policy* to support the sustainable development of the seas and oceans. The aim is to reach a good environmental status of European seas by 2020. The latest development in this order is the *Directive establishing a framework for maritime spatial planning* (2014) [3] which says that each EU member state "shall establish and implement maritime spatial planning (MSP) process, resulting in maritime spatial plan or plans". The main purpose of MSP is to promote sustainable development and to identify the utilization of maritime space for different sea uses. Even though in this synopsis the European framework is in the centre, it needs to be said that maritime spatial planning is by no means solely a European initiative, since MSP processes have been set in place and promoted around the world [4].

This synopsis is part of the BALTWISE project, which is a seed money project to prepare a MSP project focusing on transboundary planning and application of the ecosystem approach to maritime planning in the central Baltic Sea, and serves as background information for the application. BALTWISE runs from March 2014 to December 2014 under the coordination of the Finnish Environment Institute.

As major sources of information we used Google scholar, web of science and springer link databases searched with key phrases: "maritime/marine spatial planning", "sustainable blue growth" and "cross-border maritime spatial planning". Google scholar was used because we wanted also to include the so called "grey literature" (i.e. reports not published in scientific journals) as their influence on the subject matter may be significant. The articles with the highest relevance to the subject matter and geographical location (i.e. Baltic Sea) were read and cited if found important enough. Other important sources of information were the European Union's official strategy documents and directives related to MSP and Blue Growth. The synopsis was written during November 2014.

Tab. I. Direct and indirect uses of seas [5]

DIRECT USES	
Providing raw materials (oil, gas, sand, gravel)	Spiritual and cultural values (religion, folk lore, painting)
Food and employment	Education, training, research
Providing genetic resources	Coastal tourism
Providing medical resources	Recreation
Providing ornamental resources (shells, driftwood)	Physical environment (offshore wind)
INDIRECT USES	
Flood and storm protection	Nutrient cycling
Climate regulation	Bioremediation of waste
Functional habitats	

Blue economy and its future potential

The seas and coasts are becoming increasingly crowded places as growth continues in many sectors. The direct and indirect social, economic and environmental benefits provided to civil society by maritime and coastal ecosystems are varied. Direct uses range from raw materials to recreation and cultural values, whereas the indirect uses are important from the point of view of the ecological equilibrium of the environment (Table 1). [5]

The extent of Blue Economy can also be approached by its socio-economic functions serving (1) maritime trade and transport, (2) food and nutrition, (3) energy and raw materials, (4) living, working and leisure in coastal regions and at sea, (5) coastal protection and nature development, and (6) maritime security [6]. Under these functions there are sectors like offshore wind, transport, fisheries, offshore oil and gas, cruise tourism and monitoring

Fig. 1. Employment and economic size of marine and maritime economic activities. [2]

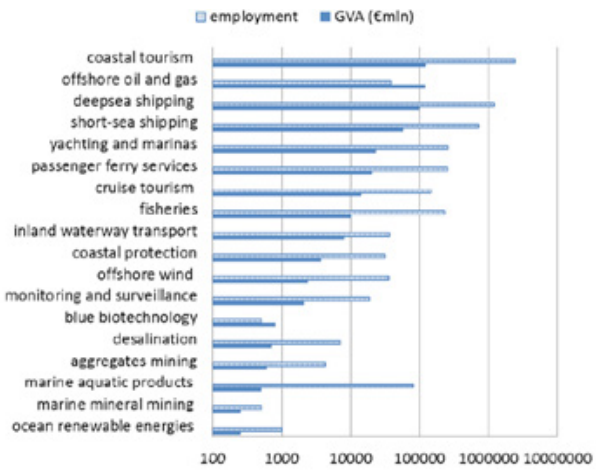
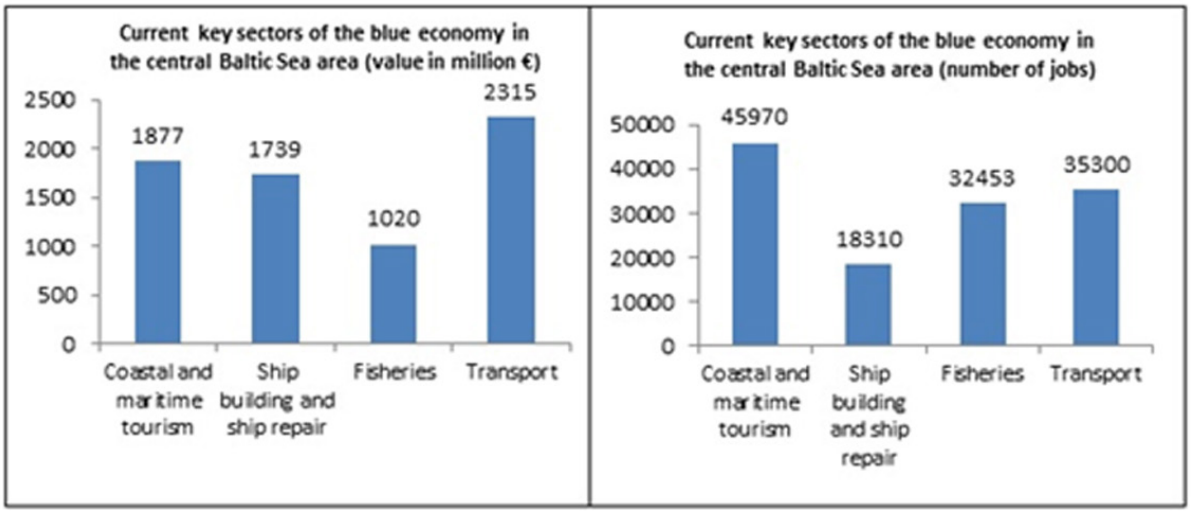


Fig. 2. Current key sectors of the Blue Economy in the central Baltic Sea area by added value and number of jobs (Adapted from [6])



and surveillance. The individual sectors of the Blue Economy are interdependent and they rely on common skills and shared infrastructure such as ports and electricity distribution networks. They also depend on others using the sea sustainably [2].

When analysing the maritime economic sectors and their future potential there are several approaches to apprehend. Statistics give us one starting point. Figure I describes the marine economic sectors in the European Union economies. Their gross value added (GVA) and employment represent value chains including relevant upstream and downstream activities [2].

At the European Union level, coastal tourism, shipping & yachting and fisheries are the biggest employers, and their GVA is remarkable. In the central Baltic Sea region, it is noticeable that at the moment the most important sectors calculated both by value and number of jobs are transport, coastal & maritime tourism, ship building & ship repair and fisheries (Fig. II). The transport sector is the biggest according to annual income (2.3 billion euros), and the tourism sector is the most important employer with over 45,000 jobs. The central Baltic Sea area covers regions from Sweden, Finland, Åland, Estonia and Latvia.

ECORYS has analysed more closely the development stage of 11 maritime sectors and their future potential (Table 2). There is a very high future potential seen in the sector of coastal protection, but on the other hand, being in its maturity stage, the economic activity related to coastal protection is estimated to remain stable and high. Offshore wind, cruise tourism and maritime monitoring & surveillance are seen to be in their growth stage with high potential for future development through strong economic and employment growth, as new companies can enter the market and the prices of technologies gradually go down. Blue biotechnology and renewable energy also have very high growth potential, but being in their predevelopment stage, the most promising outputs are still to be defined. In these prominent sectors much research and development work is still required and the commercial viability needs to be proven [6].

Growth potential is also seen in the sectors of coastal tourism (mature stage), marine aquatic products (growth stage) and marine minerals mining (predevelopment stage). Shortsea shipping and offshore oil & gas are the only sectors with very little potential for future growth, being in their mature stage where the market positions of the main players are clear and competition is fierce. There are no maritime sectors where the economic activity would be declining and where no innovations could be made. This supports the general view that there is potential for a boost in the maritime economy - in some sectors faster than others, and even in their mature stage the sectors remain significant employers.

Using the above analysis as a starting point, the European commission in its communication *Blue Growth – opportunities for marine and maritime sustainable growth* of 2012 [2] draws attention to five focus areas: blue energy, aquaculture, maritime, coastal & cruise tourism, marine mineral resources and blue biotechnology (Fig. III). At present, these are considered the most prominent value chains that could deliver sustainable growth and jobs in the maritime economy. Value chains consist of core activities

Tab. II. Maritime economic activities and their future potential by Ecorys et al. [6].

Maritime economic activities studied by development stage – based on size (2008 or latest available year), recent growth (average annual GDP growth last 5 available years) and potential (ranking 1-6 with 6 highest)

Maritime economic activity	Size (bn €)	Recent growth	Future potential
Mature stage			
1. Shortsea shipping	63	6.1%	2
2. Offshore oil and gas	107-133	-4.8%	1
3. Coastline tourism & yachting	144	3-5%	4
4. Coastal protection	1.0-5.4	4.0%	6
Growth stage			
5. Offshore wind	2.4[78]	21.7%	6
6. Cruise tourism	14.1	12.3%	5
7. Marine aquatic products	3.3	4.6%	4
8. Maritime monitoring and surveillance	1.8-2.3	+	5
(Pre-)development stage			
9. Blue Biotechnology	0.6 - 3.3	4.6%	5
10. Ocean renewable energy	<0.25	+	5
11. Marine minerals mining	<0.25	0/+	4

Note: Data on size, recent growth and future potential are taken from the First Interim Report

Future potential: Score is based on an evaluation of six criteria

which will be surrounded by both upstream and downstream activities. Upstream of the value chain are suppliers of equipment and resources, who may also have their suppliers. Downstream are processing sectors and subsequently distribution and sales. Value chain analyses allow for an assessment of functions across sectors world-wide and point out where synergies and supply chain risks can occur [6].

When we compare the above focus areas to the existing reality in the countries of central Baltic Sea, we notice that only two of them are present today in the Central Baltic economies in larger scale: coastal & maritime tourism and aquaculture. This means that traditionally strong activities like shipbuilding & ship repair, transport, fisheries and offshore oil & gas will remain significant employers, but emerging sectors will more likely provide new jobs and economic growth in a sustainable way. However, it should be noted here that the tightening environmental regulations require innovations and offer new business opportunities for traditional maritime sectors too (e.g. shipbuilding, transport). These are important aspects to be taken into account when new measures in the field of maritime spatial planning are considered; what do we want the picture to look like in 2020?

When considering future actions in maritime spatial planning, another important aspect is to consider whether the sector has transnational elements in it. The BaltSeaPlan project (2009-2012) investigated this issue and ended up concluding that there are maritime sectors with transnational elements and others which are mainly locally centralized (Table 3). In the cross-border cooperation concerning the maritime sectors like nature conservation, fishing, energy generation, linear infrastructure, shipping and extractive industries more urgently need common planning than for example tourism, scientific research, mariculture, underwater heritage or military uses. Of course, other views are also applicable: what if one day there would be a common platform for tourism in the central Baltic countries benefitting from common marketing and shared infrastructure?

Along with future potential and transnational elements, the third criteria for selecting the most relevant maritime sectors for MSP could be the urgency of actions due to the heavy growth of a sector. For example, offshore wind power generation has started to expand rapidly in Europe and aquaculture is the fastest growing animal-food-producing sector in the world, although most of the recent growth has come from Asia; in Europe the sector is stagnant [2]. In the example of the Bothnian Sea, the most important future uses identified were wind power, shipping and fisheries. Concerns for nature protection, both within and outside protected areas, grow, as pressures from different users increase. Activities such as recreational boating, military, scientific research, cultural heritage and sand & gravel extraction interests can be identified, but they are less acute in the studied offshore areas. Special precautions are needed with regard to cultural heritage and archaeology, as there are likely to be many unknown remains in the offshore seabed [8].

Fig. 3. Blue Economy sectors with the highest growth potential according to European Commission Blue Growth strategy [2]

Tab. III. Maritime sectors and their degree of internationality [7]

Sectors with a transnational element	Locally centralized sectors
Nature conservation (Natura 2000)	Tourism
Fishing	Scientific research
Energy generation (offshore wind)	Underwater heritage
Linear infrastructure (cables, pipelines)	Mariculture
Shipping	Military uses
Extractive industries (sand, gravel, oil)	

A conflict approach can also be adopted. For example, in the Plan Bothnia project (2012) there were four key areas identified standing out as particularly interesting for planning, as these areas face a high amount of interactions between different uses. It is said that wind power installations are the most acute issue in many seas of the world. The scale and their fixed nature make them different from most other uses of the sea. At large, planning should be concentrated on the developments that might influence the whole ecosystem.

Maritime spatial planning and how it can contribute to sustainable blue growth

Regulations of human use of marine areas do exist, but these have been done incrementally and predominantly within sectors, such as shipping and ports, fisheries or dredging. Little effort has made to anticipate conflicts; even less has been done to evaluate cumulative effects [9]. A greater understanding of the overall economic objectives is needed. It should also be better known how these relate to environmental objectives, and the full range of benefits provided by the ecosystem [5, 10]. It should be noted that integrated MSP highlighting Blue Growth potential can be seen as soft sustainability and truly

ecosystem-based MSP highlighting good environmental status as hard sustainability [10]. It is a political decision as to which approach is taken.

Seas and oceans have some special features which separate them from terrestrial areas: they are often international areas covering regions from different countries, the tridimensional nature of the water makes planning of different uses for different levels of the sea (bottom, free water and surface) possible, and the water currents make the implications of actions vast and unpredicted. Partly due to these specific features, the spatial and temporal scales of marine activities and good ecological status may be mismatched [11]. For instance, sand extraction may lead to sedimentation in nearby fish-spawning grounds. There is also a serious lack of marine data due to the difficult and expensive data-gathering processes, particularly in underwater conditions [12]. When talking about marine areas, the land should be also taken in to consideration as there is a clear evidence of land and sea interactions affecting the overall growth and development of the regions [2]. Social, economic and environmental benefits provided by maritime and coastal ecosystems should be considered as a whole. Therefore, there is no need to separate the practices of MSP and Integrated Coastal Zone Management (ICZM) [13].

Maritime (or as it is also called, marine) spatial planning (MSP) can serve as a tool in considering marine areas in their totality: with all their uses and users, challenges and possibilities, contradicting interests and possible synergies. As a term, marine spatial planning is more common and used globally whereas maritime spatial planning is the notion introduced by European Commission [14]. The latter one is used in this context as the European Union framework is at the centre here.

MSP has multiple definitions. Ehler and Douvere [15] define MSP as a public process of analysing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic and social objectives that have usually been specified through a political process. Foley et al. [16] defines ecosystem based MSP as an integrated planning framework that informs the spatial distribution of activities in and on the ocean in order to support current and future uses of ocean ecosystems and maintain the delivery of valuable ecosystem services for future generations in a way that it meets ecological, economic and social objectives. The MSP Directive [3] defines maritime spatial planning as a process by which the relevant EU member states' authorities analyse and organize human activities in marine areas to achieve ecological, economic and social objectives. Despite the multiple definitions of MSP, the underlying idea behind all of them is largely identical: cross-boundary, cross-sectoral and ecosystem based spatial organization of human activities [14].

An ecosystem based approach is one of the starting points of all MSP actions. The basis for the ecosystem approach lies in the Convention on Biological Diversity adopted in 1993. Maritime spatial planning can serve as one operational tool for implementing the ecosystem approach to actual planning processes, and therefore enhancing the sustainable Blue Growth. According to the Directive [3], MSP should apply an ecosystem-based approach with the aim of ensuring that the capacity of marine ecosystems to respond to human-induced changes is not compromised, and that the specific ecosystems and other specificities of the different marine regions are taken into consideration. There is a shift in paradigm required in both thinking and actions to move from a predominantly sectoral approach (maximizing opportunities and short-term gains for individual sectors set against one another) to coherent implementation of actions across relevant social, economic and environmental sectors [5].

Gilliland and Laffoley [9] present a list of potential benefits of maritime spatial planning (Table 4). First, MSP helps to combine different strategic backgrounds and can be significant in translating the strategic plans into action. Second, the anticipated benefits may offer a good starting point for promoting the use of MSP. The economic (e.g. identification of compatible uses, reduction of conflicts) and ecological (e.g. management focuses on the whole marine ecosystem, support for an ecosystem approach) benefits are important and may be already more widely accepted. Additionally, there are administrative benefits that could also be highlighted here: (1) improvement in the speed, quality, accountability, and transparency of decision-making and better regulation, (2) improvement and reduction of the cost of information collection, storage, and retrieval, (3) opportunity to assess a combination of multiple objectives and balance benefits and costs of management measures in a particular marine area, (4) evolution of the management approach for marine areas from regulation and control to planning and implementation, (5) provision of a focus for stakeholder involvement, and (6) potential improvement in the quality and availability of information for scoping and environmental assessments, including information with which to evaluate cumulative effects [14]. Developing MSP can draw selectively on experiences in terrestrial land use planning.

Tab. IV. Potential benefits of maritime spatial planning by Gilliland & Affoley [9]

- A holistic approach that addresses social, economic, and environmental objectives and so helps to achieve sustainable development
- Better integration of marine objectives (both between policies and between different planning levels)
- A more strategic and proactive approach that delivers long-term benefits
- Greater certainty for developers and thus reductions in commercial risk and the net regulatory burden
- A more efficient and accountable licensing system
- Reduced conflicts and a more equitable situation both across and within different industry sectors in the marine area
- Reduced risk of marine activities damaging marine ecosystems, including through improved consideration of cumulative effects
- More informed and rational site selection for development or conservation
- Improved capacity to plan for new and changing activities, including emerging technologies
- More efficient use of available marine space and resources
- Broad framework within which to understand and maximise the value of other measures such as marine protected areas
- More strategic and cost-effective information management

Failure to implement forward-thinking planning and management of ocean space will likely result in costs such as increased conflicts, lost economic opportunities and continued environ-

mental degradation [7]. Due to the existence of many uses in a maritime area, conflicts may arise due to both multiple activities taking place in the same area, and natural resources being limited both in space and quantity. On the other hand, MSP can also reveal the possible synergies between different uses or users, not to mention the benefits of cross-border cooperation to tackle safety and infrastructure challenges together, for example. Unexpected and positive results can be expected from increasing transnational cooperation in maritime and coastal areas, for example in the field of tourism (common sites, routes, marketing etc.).

As data and information will never be complete, an important part of the ecosystem approach is adaptive management combined with a precautionary approach [5]. There is a notion of adaptive maritime spatial planning, which involves exploring alternative ways to meet management objectives, predicting the outcomes of alternative management measures and implementing one or more of these alternative management measures. With an adaptive approach, the questions of the effectiveness and quality of MSP are raised. Here MSP is not seen as a single effort made once for each sea area, but as a process which should be tackled over and over again based on accumulating data and experiences. This requires that the goals set for a MSP process should be translated into clear, measurable objectives and outcomes. This has rarely been done. This inability should be of great concern because it prevents understanding of which spatial and temporal measures effectively lead to anticipated outcomes [18].

Elements of cross-border maritime spatial planning

Despite the broad acceptance of the ecosystem approach as a key framework for delivering sustainable development both in marine and terrestrial environments, its implementation to actual planning processes has remained vague. Governments and stakeholders lack concrete guidance and the necessary tools to make an ecosystem approach operational in the marine environment, especially with regards to cross-sectoral integration [19]. A crucial element now is to translate the high-level principles into practical actions at local, regional, national and international levels [9]

Typically a number of ecosystems of varying sizes exist within, and may extend beyond, the designated management area. The management boundaries may or may not coincide with the boundaries of regional, national, or local governments that have jurisdiction and powers of implementation. Finally, the boundaries are not likely to delimit the external influences of natural processes on the designated area, such as upwelling, sediment transport, and atmospheric deposition of contaminants. Thus, the boundaries for MSP often will not (and do not have to) coincide with the boundaries for management [17]. Therefore, the need for transboundary cooperation seems self-evident.

According to Douvere [13], European MSP – with more MSP attempts made than anywhere else – is reflected in initiatives toward trans-boundary cooperation. Cooperation is also encouraged in the recent Directive [3], which says: "member states should consult and coordinate their plans with the relevant Member States and should cooperate with third-country authorities in the marine region concerned". Furthermore, effective cooperation requires that the competent authority or authorities responsible for the implementation of the Directive are designated.

Transboundary cooperation can be interpreted as anything ranging from information exchange through some extended form of transboundary bilateral consultations and to truly transnational, joint regional processes and plans [14]. In the Directive [3] the forms of cooperation mechanisms are left undefined. At its best, cross-border cooperation makes available comparable data about environmental and economic issues, shows synergies between economic sectors (e.g. shared infra for offshore wind) and determinates common rules for the co-existence between different uses and their temporal sequences (c.f. BaltSeaPlan). International cooperation may appear more relevant in some economic sectors than others (e.g. pipelines vs. tourism).

As a whole, cross-border maritime spatial planning can only be successful if the purpose and the envisaged outcome is clearly communicated right from the start. Beyond competing national interests, the challenges for any transboundary planning process include diverging present and historical views on planning, as well as on the role of the public sector in general. The understanding of what transboundary planning actually means vary widely between European countries [14].

Backer [14] sees that evidence based transboundary maritime planning requires a functional geographic information system (GIS) which breaks down the traditional divisions between i.e. socioeconomic (e.g. socioeconomic statistics) and environmental (e.g. environmental monitoring) datasets. The HELCOM GIS server is an example of such a regional information system, serving transboundary planning efforts. It includes a substantial amount of regionally compiled and freely downloadable geo-referenced data not only on various environmental topics, but also related to different aspects of human use e.g. maritime traffic.

Transboundary cooperation in the Baltic Sea region

The Baltic Sea is considered as one of the most threatened seas in the world. It is a unique and sensitive marine environment, but is under severe human pressure. Increased economic activities in the Baltic Sea lead to competition for limited marine space among sectoral interests, such as shipping & maritime transport, extraction of gravel and minerals, offshore wind energy, ports development, tourism, fisheries and aquaculture. The first macro-regional strategy assigned in Europe was the *European Union Strategy for the Baltic Sea Region* (EUSBSR) approved in 2009. MSP and ICZM are considered as a key tool and process for improved decision-making that balances competing interests and contributes to achieving the sustainable use of marine areas.

The EUSBSR names three key objectives for the Baltic Sea: saving the sea, connecting the region and increasing prosperity (Fig. IV).

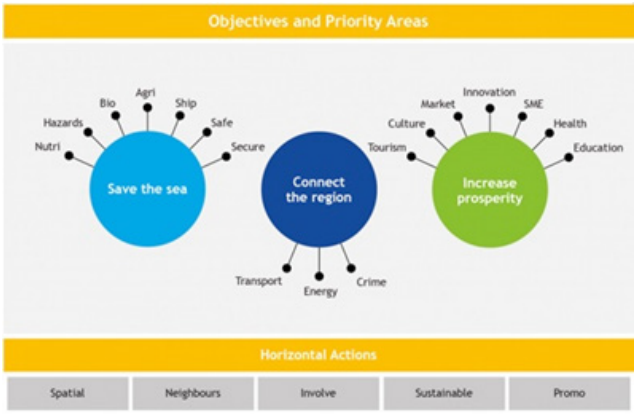


Fig. 4. Key objectives of the European Union strategy for the Baltic Sea Region of 2014 [20]

The objectives guide an array of priority areas which are specific areas for macro-regional cooperation that address the key challenges and opportunities in the region. Examples include promoting clean shipping and supporting SME growth. The priority areas should be implemented by regional stakeholders through different actions and projects. The horizontal actions are the guiding principles for all the actions. Examples include boosting joint promotion and regional identity building actions [20].

In the Baltic Sea region there is a regular intergovernmental MSP dialogue happening in the form of the joint HELCOM-VASAB Maritime Spatial Planning Working Group launched in 2010. Every Baltic Sea country and the European Commission are represented. The working group has made several outcomes towards more coordinated cooperation in the Baltic Sea to draw up and apply maritime spatial plans throughout the sea by 2020. To guide MSP processes there is a list of principles set by the working group (Table 5).

Baltic Sea region ministers responsible for spatial planning and development met in October 2014. As one of the main future goals, ministers decided to urge the Member States and the HELCOM-VASAB Committee to initiate and support maritime spatial planning projects, fully exploiting the potential of all relevant financing instruments, especially the trans-national Baltic Sea Region Programme. Issues like planning and balancing the use of marine space, improving accessibility and connectivity, ensuring energy connections and the shift towards renewable resources and energy savings. The notion was made that one of the important themes for the next seven years in the Baltic Sea is maritime spatial planning [21].

Tab. V. Broad-scale maritime spatial planning principles for the Baltic Sea by HELCOM-VASAB [23]

1. MSP as a key tool for sustainable management	6. MSP based on high quality data
2. Ecosystem approach as an overarching principle for MSP	7. MSP with transnational coordination and consultation
3. MSP with long term perspective and objectives	8. Coherent terrestrial and maritime spatial planning
4. MSP based on precautionary principle	9. Planning adapted to characteristics and special conditions at different areas
5. MSP as an open and transparent process	10. MSP as a continuous process

Key steps and ideas for future development

Raise awareness and motivate

Although there has been increasing interest in maritime spatial planning, there is still work to do before there is a systematic, well-informed management regime for marine areas. The key questions for future development are presented in table 6. One reason for this is a lack of information on the added value of MSP compared to other existing measures. There is an increasing body of literature aiming to define good practices for spatial management, and pilot projects have been conducted to create concrete tools for planning. However, more research is needed to show the concrete benefits of MSP, e.g. of gained synergies between sectors.

Tab. VI. Key questions for the future development of MSP

How to raise interest in MSP among authorities?
How to choose and engage co-operation partners?
How to create a common vision for a maritime area?
What are the concrete tools to translate strategic plans in to action?
How to carry out planning: spatial and temporal limitations?
When and why is transboundary approach indispensable?
How to fil still existing data gaps of environmental conditions?
How to include economic and social impact assessment to the maritime spatial planning?
Are today's legal requirements enough in order to make efficient MSP?
Is there something that could be learned from terrestrial planning?
How to evaluate the effectiveness of planning?

MSP still seems to lack politically convincing power, and persuading relevant authorities of MSP is essential to make progress. To make maritime spatial planning a functional tool, there should be an authority with a clear mandate to guide and govern MSP processes at the regional level. The role of individual projects is to develop instruments, test models, facilitate MSP processes etc. There are some legal requirements related to the sea areas and maritime spatial planning, but the question is whether they are enough in order to make efficient MSP. Does some sort of legal pressure have to be in place for cross-border cooperation to work?

Stakeholder engagement

Stakeholder engagement is at the very heart of any MSP process, and the level of stakeholder engagement will be an important

factor in the success of MSP. Stakeholders should be involved in developing the overall MSP process, not only at consulting. Critical questions are how to choose and engage co-operation partners. The PartiSeaPate project (2012-2014) tested and developed instruments and models for how MSP multi-level governance mechanisms could be realized in the Baltic Sea region [29].

Stakeholders can be policy makers, professional planners and practitioners, scientists, civil servants and citizens. Identifying the right stakeholders is a challenging task, but a substantial effort should be made to bring together all sectors and ensure they contribute. It is important to include in MSP processes not only marine specialists and data providers, but also terrestrial planners, policy makers, legislators, economists and social scientists. Stakeholder engagement can be done in many ways, and the most appropriate approach depends on the context [9].

Much of the debate on developing MSP has taken place among the marine community, but those that understand planning also have something to offer. Many lessons can be drawn from the implementation and evolution of land use planning. These include elements like integration of a wide variety of sectoral policies in space, a defined time horizon with periodic renewal, different levels providing context for more detailed levels below, and the procedures for consultation and participation [9].

Building up a vision and evaluating the outcomes

Planning is about more than gathering information and producing maps: it expresses a vision about what is desired in the future, forecasts future needs and conditions, and derives scenarios. This is where initial effort in the planning process should be directed as planning requires clear, specific objectives to provide a context for spatial data [9]. In the BaltSeaPlan project there was a vision-building exercise made for the Baltic Sea with a timeframe set to the year 2030 [22].

There is a goal for the MSP system as a whole. Furthermore there should be clearly set economic, social and environmental objectives for different sectors and for different interests. There can be a hierarchy in vision building where the high-level objectives are concretized in numerous targets and policy implications. It might be that only high-level objectives are already in place (i.e. halt deterioration of biodiversity) whereas overt objectives for some economic sector, cultural heritage or social justice often need to be created [9]. Objectives set up in the very beginning of the MSP process are applied as policy priorities directing the planning process. According to Gilliland and Laffoley [9] the emphasis should be more on integrating (rather than balancing) between competing objectives as MSP should help to build synergies among different objectives. There is an example from the Irish Sea where scenario building was tested in correlation to the existing conflicts. The result was obvious: the distinct objectives set for planning resulted alternative scenarios, which then led to the different policy priorities, and at the end there were various policy maps to guide the future action on the sea [23].

Hand in hand with objectives come monitoring and evaluation, which are needed to promote understanding and improve planning and decision-making. Plans need to be reviewed regularly in response to new data. A typical period for cyclical review appears to be 5-7 years. What is important is to provide clear guidance on how to take account of new information without having to review the whole plan [9]. The big questions are how to evaluate the effectiveness of plans, and in particular, how to include economic and social impact assessment in the maritime spatial planning.

Analysing information

The key input to the planning process is spatial data. As a first step, the temporal and spatial limitation should be defined. Preferably plans should follow meaningful ecosystem boundaries such as those based on biogeography and oceanography. In practice planning units will also need to reflect socio-political and administrative considerations and a sensible balance will need to be achieved between these factors. Yet, there is the landward boundary to consider too. In theory, it will vary depending on the nature of the issue being addressed, but in practice a set of landward boundary will need to be defined for legal reasons. When it comes to temporal issues, the timeframe of plans seems to vary from 10 years to up to 20 or even 25 years [9].

The scope of relevant data extends beyond environmental resources and human activities to legislation, policy and values. The sources of data are multiple too: research institutions, industry, government authorities, and more sea users. Poor and limited data will limit the scope of planning. There are still knowledge gaps concerning wildlife and living organisms of sea offshore areas. The available measurements are restricted to modelling and station-based sampling of plankton, fish and seabed fauna, and do not provide a reliable overview of the distribution of ecologically important areas. More information is also needed for example from ship wrecks and sunken hazardous substances [8]. Effort should be also devoted to collating existing data through new interpretations.

One common way to proceed in data analyses has been to identify natural and socio-economic components like the ecology of a marine area and characterization of human activities. At the next step analysis has been conducted of the spatial overlap of the distribution pattern of the relevant components. Conflicts can be user-user or user-environment based. The setup of a Geographical Information System (GIS) eases the collation, visualization and analysis of spatial information, and it has been largely used in the pilot projects.

There has been a lot of data gathered regarding the Baltic Sea region by recent pilot projects BaltSeaPlan (2009-2012) and Plan Bothnia (2010-2012). In the latter the regional planning structures in Finland and Sweden are also presented. The questions to be further discussed are how to fill the existing knowledge gaps, and what should be done to enhance the management and access to data? Some common platforms of data have been put in place (cf.

The Baltic Sea portal), but the question is whether they are useful for different purposes and accessible enough.

Preparing a spatial plan

The degree of planning effort and detail required will vary spatially depending on circumstances, such as the level of human use and conflict, and in some cases may not be needed at all. Just as ecosystems operate at different scales, so too should MSP. Experience suggests that it is best to take a hierarchical approach, addressing different issues at each level. The scale at which each level is defined will vary from country to country. One example would be a national (strategic planning policy guidance), regional or broad scale (integration of policy and comprehensive planning) and local (i.e. heavily-used or high-conflict areas) levels applied [9].

There have been several pilot projects aiming at developing MSP framework and processes. As a result, some of them have produced maritime spatial plans where the hierarchies and overlapping interests have been presented through key areas (PlanBothnia), suitability analysis [25] and conflict analysis (maps, matrices) defining area categories (priority area/reservation area/suitable area/open use area) (BaltSeaPlan) [22].

From the national level there is an interesting example from the region of Kymenlaakso in Finland where the terrestrial planning process was extended to the coastal sea areas for the first time in history. As a result, there were value zones defined based on highly vulnerable areas. The example of Kymenlaakso is especially encouraging because it has risen from voluntariness and shows increasing awareness towards maritime area from the point of view of regional development [26].

Other questions to be asked here are whether a fully developed plan is always needed for entire ecosystem, or if for some areas a rather general planning regime (e.g. based on guiding principles) would suffice? An ever more current issue is, should MSP initially start in priority areas (e.g. densely used areas or areas with high vulnerability) due to limited financial and human resources? What about the best method for planning? And what are the concrete tools to translate strategic plans into action?

Tab. VII. Summary of characteristics important for successful implementation of MSP (Adapted from Laffoley & al. 2004)

- Shared vision, high level principles and strategic goals
- Good stakeholder involvement
- Good public awareness
- Good co-operation amongst stakeholders
- Good communication amongst stakeholders
- Good information sharing
- Adequate personnel resources
- Adequate funding
- The availability of scientific information, assessment and monitoring
- Clearly set limits, targets and indicators embracing regional diversity through a regional approach
- Subsequent changes in the management of activities
- Have regionally-based operational objectives
- Have pre-agreed risk management actions

When it comes to cross-border cooperation, the benefits of the cooperation should still be looked more closely to argue when and why a cross-border approach is indispensable. To build up such arguments would require looking into the overall national policies of the countries with regards to environmental conservation and economic development: what are the priorities of the respective countries towards future environmental and economic development, and how are they related to the sea area in question [8]? More discussion is also needed to clarify whether cross-border cooperation is required in all maritime sectors or only some of them.

CONCLUSIONS

The seas and coasts are vital elements of our societies. They offer a wide range of possibilities ranging from trade to recreation. With the increasing use of maritime areas, there is simultaneously an increasing worry regarding the wellbeing of our seas. There is a need for more coordinated use of seas. The maritime spatial planning is considered to be a key tool and process for improved decision-making. In the terrestrial land-use planning the individual permit decisions on a case-by-case basis has been replaced by a more strategic planning process that lays out a vision that can guide sectoral planning and permitting. This should be the future of MSP too.

During the last decade, there has been much valuable environmental and socio-economic data gathered, governance mechanisms developed and pilot plans created in multiple MSP projects that have also taken place in the Baltic Sea region. The benefits of MSP have been discussed for several years, and now the time has come to put into action the actual planning processes. For ensuring sustainability of MSP, there is still, however, a lack of information on marine environment and risk analysis of human activities, stemming partly from special features of the marine space, and leading to consequences such as spatio-temporal mismatches [11]. However, these challenges should not prevent society from making MSP with sustainability a goal. By using precautionary principles and adaptive planning as with effectivity analysis and stakeholder involvement, it is possible to ensure sustainable planning for human activities on sea. However, vision for the planned area is a political decision and MSP may aim for either hard sustainability or soft sustainability [10]. So far there have been only recommendations towards sustainable Blue Growth, and each country remains responsible for designing and determining the format and content of maritime plans. MSP processes should be developed both at national and international levels.

Marine issues belong to policy makers, professional planners and practitioners, scientists, civil servants and citizens involved. Rather than solving acute problems between competing uses of the sea, identifying the possible, desirable futures of the sea basin is more crucial. As a whole, MSP is not just a technical process of allocating the different marine uses, but a creative social process of building attractive identities for the sea.

References:

[1] Shaw D., Kidd S., McGowan L. and Jay S. (2013). ESaTDOR – European Seas and Territorial Development, Opportunities and Risks. The final report of ESaTDOR project. Retrieved from http://www.espon.eu/main/Menu_Projects/Menu_AppliedResearch/ESaTDOR.html

[2] European Commission. (2012). Blue Growth – Opportunities for marine and maritime sustainable growth. Retrieved fromhttp://ec.europa.eu/maritimeaffairs/documentation/publications/documents/blue-growth_en.pdf

[3] European Commission. (2014). *Directive establishing a framework for maritime spatial planning*. Retrieved from http://ec.europa.eu/maritimeaffairs/policy/maritime_spatial_planning/documents/com_2013_133_en.pdf

[4] Jay, S., Flannery, W., Vince, J., Liu, W., Xue, J.G. and Matczak, M. (2013). International progress in marine spatial planning. In: Chircop, A., Coffen-Smout, S. and McConnell M. (eds). *Ocean yearbook 27: Coastal and marine spatial planning*. Leiden, Boston, Martinus Nijhoff Publishers. pp.171–212.

[5] Laffoley, D.d'A., Maltby, E., Vincent, M.A., Mee, L., Dunn, E., Gilliland P., Hamer, J.P., Mortimer, D., and Pound, D. (2004). The Ecosystem Approach - Coherent actions for marine and coastal environments. *A report to the UK Government*. Peterborough, English Nature. Retrieved from http://nepubprod.appspot.com/publication/30041?category=38019

[6] Ecorys, Deltares and Oceanic Development. (2012). *Blue Growth Scenarios and drivers for Sustainable Growth from the Oceans, Seas and Coasts.* Third Interim Report. Retrieved from http://ec.europa.eu/maritimeaffairs/documentation/studies/documents/blue_growth_third_interim_report_en.pdf

[7] European Commission. (2014). *Infographics.* Retrieved from http://ec.europa.eu/maritimeaffairs/policy/blue_growth/infographics/

[8] Backer, H. & Frias, M. (Eds.) (2012). *Planning the Bothnian Sea – Key findings of the Plan Bothnia project. Digital edition 2013.* Retrieved from http://meeting.helcom.fi/c/document_library/get_file?p_l_id=80557&folderId=2142734&name=DLFE-52914.pdf

[9] Gilliland, P.M. and Laffoley, D.(2008). Key elements and steps in the process of developing ecosystem-based marine spatial planning. *Journal of Marine Policy*, 32, 787-796.

[10] Frazão Santos, Domingos, T., Ferreira, M. A., Orbach, M. and Andrade F. (2014). How sustainable is sustainable marine spatial planning? Part I—Linking the concepts. *Marine Policy* 49, 59-65.

[11] Gilbert, A.J., Alexander, K., Sardá, R., Brazinskaite, R., Fischer C., Gee, K., Jessopp, M., Kershaw, P., Los, H.J., Morla, D.M., O'Mahony, C., Pihlajamäki, M., Rees, S. Varjopuro, R. (2015). Marine spatial planning and Good Environmental Status: a perspective on spatial and temporal dimensions. *Ecology and Society*, 20, 64. Retrieved from http://www.ecologyandsociety.org/vol20/iss1/art64/

[12] Repka, S. and Telaranta, J. (2013). Meret ja aluekehitys. *Publications from the Centre for Maritime Studies*, B189, 80-91.

[13] Douvere, F.(2008). The importance of marine spatial planning in advancing ecosystem-based sea use management. *Journal of Marine Policy* 32: 762– 771.

[14] Backer, H. (2011). Transboundary maritime spatial planning: a Baltic Sea perspective. *Journal of Coastal Conservation* 15: 279–289.

[15] Ehler, C. and Douvere, F. (2007). Visions for a Sea Change. *Report of the First International Workshop on Marine Spatial Planning. Intergovernmental Oceanographic Commission and Man and the Biosphere Programme*. UNESCO.
Retrieved from http://www.fao.org/fishery/gisfish/servlet/CDSServlet?status=NDoxMTM0LjQxMTMmNj1lbiYzMz13ZWJfcmVzb3VyY2UmMzc9aW5mbw~~

[16] Foley, M.M., Halpern, B.S., Micheli, F., Armsby, M.H., Caldwell, M.R., Crain, C.M. and Steneck, R.S. (2010). Guiding ecological principles for marine spatial planning. *Journal of Marine Policy*, 34, 955-966.

[17] Ehler, C. (2008). Conclusions: Benefits, lessons learned, and future challenges of marine spatial planning. Journal of Marine Policy 32: 840– 843.

[18] Douvere, F. and Ehler, C. (2011). The importance of monitoring and evaluation in adaptive maritime satial planning. *Journal of Coastal Conservation*, 15, 305-311.

[19] Douvere, F. and Ehler, C. (2009). New perspectives on sea use management: Initial findings from European experience with marine spatial planning. *Journal of Environmental Management*, 90, 77–88.

[20] EUBSR (2014) website visited 24.11.2014 http://www.balticsea-region-strategy.eu/

[21] VASAB. (2014). Website visited 24.11.2014: http://www.vasab.org/index.php/news/item/224-baltic-sea-region-minbacisters-responsible-for-spatial-planning-and-development-meet-in-tallinn

[22] BaltSeaPlan (2013). *Vision 2030 – Towards the sustainable planning of Baltic Sea space*. Available at: http://www.baltseaplan.eu/index.php/BaltSeaPlan-Vision-2030;494/1.

[23] HELCOM-VASAB. (2014). BALTIC SEA BROAD-SCALE MARITIME SPATIAL PLANNING (MSP) PRINCIPLES http://www.helcom.fi/Documents/HELCOM%20at%20work/Groups/MSP/HELCOM-VASAB%20MSP%20Principles.pdf

[24] MSPP Consortium. (2006). *Marine spatial planning pilot – Final report.* Retrieved from http://www.abpmer.net/mspp/docs/finals/MSPFinal_report.pdf

[25] Douvere, F., Maes, F., Vanhulle, A. & Schrijvers, J. (2007). The role of marine spatial planning in sea use management: The Belgian case. *Journal of Marine Policy,* 31, 182–191.

[26] Schultz-Zehden A. & Gee K. (2013). *Findings – Experiences and lessons from the BaltSeaPlan.* Retrieved from http://www.baltseaplan.eu/index.php/Reports-and-Publications;809/1#findings

[27] Regional Council of Kymenlaakso. (2013). *Kymenlaakson maakuntakaava – Kauppa ja merialue.* Retrieved from http://services.kymenlaakso.fi/www/DimDocumentDownload?action=show&id=6635&fileId=14910

[28] Herring F.(2014) Finland in: Zaucha J. (ed.) The key to governing the fragile Baltic Sea. Maritime Spatial Planning in the Baltic Sea region and Way Forward, Riga: VASAB, pp.30-32 retrieved from http://www.vasab.org/index.php/maritime-spatial-planning website visited 26.07.2015

[29] Schultz-Zehden A. & Gee K. 2014. MSP Governance framework report. *Report of the PartiSEApate project.* Retrieved from http://www.partiseapate.eu/wpcontent/uploads/2014/07/PartiSEApate_MSPGov_Report.pdf

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