

# Impact of Blue Growth on Baltic Sea Region Ports

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**Abstract.** *There is little attention in the Baltics dedicated to the research of ports as economic subjects and their impact on environment. It is vital to strengthen the links between the ports and the Blue Growth while raising awareness of the Blue Growth and making it a cross-cutting issue of the sea-oriented priority areas by creating a special mechanism to support Blue Growth which so far has had insignificant links to port operations. The aim of the article is to analyze the trends and summarize the measures already taken for promotion and integration of the Blue Growth in the Baltic Sea region, and to develop guidelines for ports based on the general and the Baltic Sea Blue Growth strategy, to draw conclusions and to submit proposals for improvement and increase of the Blue Growth. Latvia needs to develop an action plan in order, without unnecessary errors, to quickly implement sustainable port infrastructure and reduce pollution of the sea. The task is to identify the best practices for usage of marine/coastal resources for economic development, and for identification and testing of new smart specialization measures.*

**Keywords:** *blue economy, ports environmental impact, marine ecology.*

## I. INTRODUCTION

The Baltic Sea is endangered and actions that are being taken to regenerate the environment of the Baltic Sea are not sufficient to improve the situation. At this moment, the economic resources of the Baltic Sea are not being used sustainably and the Baltic Sea region risks losing hundreds of thousands of potential work places and future profit that can be measured in billions, if thought-out and focused measures will not be taken to protect and sustain the sea's ecosystem, as well as to use the sea's resources sustainably.

The **aim** of article is to analyse the trends and summarise the measures already taken in the Blue growth and integration of the Baltic Sea region, and develop guidelines for ports based on the general and the Baltic Sea Blue Growth strategy, to draw conclusions and to submit its proposals to improve the Blue growth and increase.

The tasks that are established to reach the aim: based on the available specialised literary sources to analyse the overall concept of Blue Growth as well as the concept of the Baltic Sea region [4], by summarising and analysing the taken measures and implemented projects in the Baltic Sea region in the context of Blue Growth to disclose contributing and delaying factors for successful Blue Growth integration and to develop guidelines for realisation of Blue Growth tendencies and adaptation possibilities in ports of the Baltic Sea region.

## II. MATERIALS AND METHODS

In the last years, terms like “Blue Economy” and “Blue Growth” are widely used, but there is no consensus as to what it means - some understand it as management without impoverishing the economic goods provided by the sea ecosystems in long term, others consider “Blue Economy” as any economic activities in industries connected with sea[2].

Blue Growth is a long-term strategy to strengthen sustainable growth in maritime affairs industry and in marine industry economy in general. It acknowledges that seas and oceans stimulate Europe's national economy, and they are inherent to a big innovative and growth potential. Integrated maritime affairs policy helps to reach the goals of smart, sustainable and inclusive growth strategy of “Europe 2020”[3].

Blue Growth strategy consists of three parts:

1. Specific policies of integrated maritime affairs - actions that include knowledge about sea, to improve access to information about sea, planning of maritime space to ensure effective and sustainable sea management and integrated sea supervision so that authorities would have more specific information about the processes at sea.
2. Sea-basin strategies - which is recognised as the most suitable body of actions to advance sustainable growth and which considers the local climatic, oceanographic, economic, social and cultural factors in different sea-basins.

3. Specific actions approach - which includes: aquaculture (fisheries website), coastal tourism, sea biotechnology, ocean energy and extraction of natural resources at sea[3].

These above mentioned strategic points are worked into a special programme of advancing Blue Growth of the Baltic Sea region. Namely – the Baltic Sea, even though it is the youngest sea in the world, now it faces serious environmental problems (eutrophication, overfishing, pollution etc.) which, by collaboration between all the Baltic Sea region countries and following the proposed strategic aims, are slowly being solved.

### III. RESULTS AND DISCUSSION

At this moment, the biggest challenge for the Baltic Sea region countries is creating a determined and ambitious strategy and policy of Blue Economy at the level of government, society and individuals.

The task of the Baltic Sea's Blue Economy is to help returning sea's health, by not exceeding the capacity of sea as an ecosystem, by quickening the transition to cleaner technologies and sustainable energy and by creating an environmentally friendlier flow of materials (by optimising usage and circulation of reusable materials). Also, the Blue Economy strategy must create new work places and economic opportunities, but, in the planning and implementation process, representatives of government, business and different science branches must be involved, as well as inhabitants of the region's countries, so that the common aims could be reached easier and faster.

The principles of sustainable Blue Economy must give clear indications on smarter managing. At the beginning a vision of sustainable Blue Economy must be created, as soon as the vision becomes clear, precise aims and points of conduct must be set by taking specific measures in different sectors of economy in all involved stages. Realistic Integrated Maritime Policies, adequate economic and legislative allowances, as well as provided support for the flow of finances and investments in public and private sectors, and successfully realised, ecosystem based spatial planning of sea are the main tools that will help to approach the set goals.

Blue Economy can only be sustainable when sustainable economy is also being successfully realised on land, ergo economy that renews, protects and sustains diverse and stable ecosystems, as well as an economy that is created based on clean technology, renewable energy and optimised flows of materials.

Because of the population growth, global competition for resources, food, water, threats to marine safety, climate change, sea pollution and technical possibilities, weight is increasingly being put on marine resources and the ability of seas to further provide goods on which functioning of society

is depending on is decreasing. The existing international regulation of ocean management is not sufficiently effective to solve these joint problems and it fails to ensure sustainable management of oceans and their resources.

Since EU is and will be even more dependent on seas and oceans, for the last 10 years it has tried to strengthen inner processes of ocean management and purposefully collaborated by creating a better multilateral regulation worldwide. EU accomplishments till now:

- comprehensive access is established to all marine and maritime affairs questions, namely, integrated EU maritime affairs policy;
- strict environment regulations are introduced, which will achieve sustainable usage of sea resources and which are mandatory to all EU members involved in the field of maritime affairs, wherever they are engaged in;
- EU level strategy is developed on how to promote sustainable and inclusive growth of marine industries, it is integrated in EU outward dimension, for example, concerning natural resources, energetics, trade, development and safety;
- regional strategies are established to solve joint problems and possibilities, by closely collaborating with countries outside EU and non-governmental members;
- marine research has been reserved around 350 million euros a year for establishing mechanisms to improve collaboration and information exchange and to publish marine data;
- EU has joined international and intersectional forums to look after with joint forces that seas and oceans all over the world are safe, clean and productive.

The data of countries does not provide all necessary information about the sea, because it is a global system, where changing winds, seasonal currents reign and migrating species can be encountered, that is why it is very important to conduct analysis on Europe level.

EU decides authority in such industries as fisheries, environment, transport, research, business and industry, which allows to attach EU funding and to adopt legal acts that are necessary for extending the knowledge basis till year 2020.

In 2011 Commission adopted Communication about growth of maritime industries [1], which shows that European seacoasts, seas and oceans can be a significant source in the field of new work places and growth [2], and that in its turn can help to realise "Europe 2020" strategy and to improve the way we use the planet's resources. Communication pays special attention to specific new industries.

To develop the potential of marine industries in Europe, Commission has researched how with EU

level measures such problems characteristic to economy of marine industries can be solved [6]:

- imperfections in knowledge and data about the condition of oceans, sea-bed resources, marine organisms and risk habitats and ecosystems;
- heterogenous research efforts in the field of marine scientific and technological research, which delays acquisition of intersectional knowledge and slows down advancement in key sectors of technology and innovative business sectors;
- lack of such scientists, engineers and qualified employees who can use new technologies in the sea environment.

According to the programme “Horizon 2020”, research will be aimed at how new technologies marine resources can be used productively and create sustainable growth and employment, at the same time ensuring that these resources can also be used by the next generations.

Growth in economy of marine industries will need corresponding innovations which can help to develop economy of marine industries, which not only promotes EU growth and creation of work places, but also maintains the public sector’s support for commercial use of marine resources and at the same time ensures protection of marine environment to create understanding about seas and modern technologies with the intention to develop their economic potential in a sustainable way.

To achieve that a series of actions must be taken:

1. To create a sustainable process which ensures that marine data is easily accessible, compatible and without usage restrictions;
2. To create a digital multi-resolution map of the entire seabed for all Europe waters;
3. To create information platform about marine research in the whole programme;
4. To create a business and science forum of Maritime affairs economy;
5. To promote creation of union of skills connected with marine industries.

#### *Maritime spatial planning*

The activity of industries’ interests is always growing: shipping and marine transport, marine energy plants, port development, fishery and aquaculture, and environment protection.

It is very likely that climate change, especially the rising of sea level, acidification and rise of water temperature and more frequent extreme weather conditions will create changes of economic activity in marine territories and changes in marine ecosystems. Maritime spatial planning can be a significant tool for lessening the impact of these changes, by promoting effective usage of marine territories and renewable energy and profitable adaption to the impact of climate change in marine territories and coastal waters [10].

The Baltic Sea region has all the necessary elements to move towards sustainable and innovative maritime economy and, in comparison with other EU regions, it has a lower level of unemployment, accelerated growth and a lower public debt in proportion to GDP, as is stated by European Commission in the 2014 Working Document about the growth programme for the Baltic Sea region [4].

Thus, to promote advancement for Blue Growth strategy, a work plan is developed specifically for the Baltic Sea region, which has taken into account all the specific characteristics of the region, following which four elements are stressed:

1) Consequent approach to innovations, collaboration and increased sustainability

Such activities as coastal tourism, aquaculture and fisheries depend on healthy environment and good condition of water. As it has been clarified within this work, the Baltic Sea is facing rather big problems (eutrophication, overfishing etc.), which - if not solved - maybe not in short-term, but in long-term will leave a negative impact on everything - people, economy, environment and the activities mentioned above. That is why the development of Blue biotechnologies and aquaculture is necessary, as well as a stronger link between research and economic market.

2) Raising of skills and qualifications, cluster development

To achieve the potential of Blue Growth and overall economic growth skilful and qualified people are necessary, especially in industries connected to research and innovation. Also, competent and young people are necessary in sectors with potential for growth, for example, sea transport and coastal tourism, where one of the recognised problems is insufficiency of corresponding knowledge and skills, as well as the ageing of work force. Founding of clusters is also important, so that the region’s countries have a chance to create in between themselves a link between science and research.

3) Development based on what is achieved until now

A basis for Blue Growth must be provided with support and promoting activities: planning, supervision and monitoring, because they are the basis of well-functioning coastal and water ecosystem, the collaboration between public and private sectors. As the Blue Growth studies estimate, in the Baltic Sea region this growth will mainly be promoted by the private sectors, which is followed by connected data and analysis to support the infrastructure projects and to avoid uncertainty in planning and investments [6].

4) Access to funding in maritime industries

The access to funding can be seen as the main obstacle or hindrance for development of maritime economy in the Baltic Sea region and elsewhere. Suggested European Structural and Investment Funds

are developed for the 2014 - 2020 financing period, adjusting to the sea basin/Macro regional strategy and Blue Growth.

Main threats to development of Blue Growth in the Baltic Sea:

1) In the Baltic Sea region, Blue Growth does not work because of the heavy load on environment both from dry land and the human activities at sea. The biggest problems in the Baltic Sea have occurred as a result of people's thoughtless usage of marine resources: eutrophication, pollution and unsustainable fishing industry - of course, there are many others, but these are the three main ones.

2) Thus, for example, fish resources are only almost 30-40% of the historical minimum, not to mention the fact that in separate regions the usage of caught fish in food is questionable [8], as well as the tourism clients that are being lost as a result of eutrophication and pollution. Usage of fossil fuel - mainly in economic activities on land, which further global warming, which in its turn because of rising average annual temperature furthers eutrophication, and eutrophication leaves a negative impact on biological diversity. In conclusion, the negative impact at sea must be mentioned, which results from construction, excavation etc., as well as the entry of invasive species in the Baltic Sea from ship's ballast waters and the threats that fish hatcheries create by spreading illnesses and genetic materials between wild fish.

3) In the Baltic Sea region, both Blue Growth and economy on land is based on linear flow of materials and non-renewable energy. As a result of these linear, sometimes even toxic, flows of materials and usage of non-renewable energy, the Baltic Sea region is not only subjected to the problems mentioned above - eutrophication, pollution and insufficient fish stocks, but also the long-term productivity of these activities is being threatened from the perspective of lack of natural resources. Linear usage of materials means using the material once and leaving remainders - if there are some - as waste. Scientists foresee that if soon in the Baltic region circular for all sorts of raw materials - ergo recycling possibilities - will not be considered, then such natural nutrient as phosphorus could disappear during a period of two or three generations [9]. Concerning non-renewable energy, the Baltic Sea region is under a big economic risk by using fossil fuel as the main source of energy, not to mention the consequences this all leaves on productivity of ecosystem as the result of climate change.

4) Development of Blue Growth risks putting nature of the Baltic region under pressure even more, as well as heightening competition for who will have more marine space. Blue Growth has been fixed definite economic numbers, for example, creation of working places and promoting of tourism, and in the Baltic region these numbers are growing, but sadly

very often not in a way which ensures sustainability and that is exactly why nature of the Baltic Sea region is put under an even bigger pressure.

Until now researchers were more worried about pollution created by airplanes, cars and railways, but comparatively less attention has been paid to emission sources at sea. It must be considered that air pollution at sea can travel great distances, thus it influences not only the marine environment, but also land. The main innovation in marine industry is collaboration and partnership. Member states of the Baltic Sea region are already gaining from the smart specialisation platform specially created by European Commission, which is created to promote better experience exchange, provide consultations for policy creators and to help them concentrate their resources on those spheres, where they have relative advantages, but still the biggest work in this industry should be done by scientists. Serious work must be put into reducing pollution and eutrophication in the whole Baltic Sea region, as well as reducing air pollution created by ships in the whole Baltic Sea region, as well as in ports and harbour towns, which is demanded by Annex IV of MARPOL [7] convention which came into effect on January 1, 2015. To be able to lessen content of sulphur emission in ship fuel and make the Baltic Sea an example of clean seafaring, it is important to avert the main seafaring problems. We lack not only environment-friendly infrastructure, but also research that could help finding solutions on how to improve the sea's condition [5]. EU White Paper anticipates to take polluting fuels out of circulation and replace them with more environment-friendly types of fuel. That is why there is importance in collaboration between different institutions and involving funding from other programmes, where the main aim is to conduct research on what is necessary for improvement of port infrastructure to decrease eutrophication and emissions from ships.

Cargo flow in ports is increasing, number of passengers is also growing, but many actions still are more based on the concept "more, faster and more effective", where the influence on environment is left in the background, that is why during the last years the concept of "green thinking" is becoming more popular also when analysing sea transport e.g. possibilities for ports to support environmental protection and sustainability. What tendencies decide, whether a port is "Blue thinking" is not publicly and legitimately determined, but ports are an important element of Blue Growth. The way how ports can ensure a bigger value is with the help of effective elements of logistics. The aim of a modern port is to avert delays, shorten the processing time and to increase efficiency. But it must be admitted that the activities of ports influence the surrounding environment and a way to lessen this negative

influence, is to connect the ship with coastal electricity, obtaining Blue Growth from a Green Port.

#### IV. CONCLUSIONS

Blue Growth is not only limited to maritime industry, it is an attempt to unite environment protection with economy and, following that, it can be called a style of management and life or philosophy, where the main key words are integration, wisdom (intelligence) and sustainability, which will help solving problems of poverty, welfare and good environment. Blue Growth is a new economic concept and the Baltic Sea region is still in the process of adaptation, because the programme or plan specifically for Blue Growth Integration in the Baltic Sea region (A Sustainable Blue Growth Agenda for the Baltic Sea Region) was only developed in 2014. Specifically, ports as a sector do not have developed guidelines for integrating Blue Growth and thus they have a chance for interpretation. But it must be admitted that there can be seen Blue Growth tendencies in ports, although they could as well be connected to concepts of Green and Circular economy, which more or less are supported by and included in Blue Growth. Ports and conductors of business in ports have a possibility to subordinate tendencies announced by Blue Growth, create projects and attach investments from EU funds. To solve the questions of sustainability and integration, as well as to promote innovations in technologies connected to seafaring and connection with Horizon 2020, member states of European Union could create a united universal general plan for the Baltics, as well as ports specifically, where there would be clearly established, measurable and internationally consequent aims and tasks, also in the process of integration they must be mutually coordinated to avoid conflicts about some negative consequences created by actions or inactivity of one sector. Also, very important is control of these tasks and aims, evaluation of progress and transparency, so that information would be available to all, which

could be provided by European Commission. Ports and business sectors need to found new maritime clusters, because that is a chance to increase the business efficiency of the involved companies by collaboration between industry's companies, educational institutions and research institutions, also EU (Regional Development Fund) gladly provides financial support for that.

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