

Introducing the Blue Economy concept in the Romanian nearshore

Catalin ANTON

catanton@gmail.com

Carmen GASPAROTTI

Carmen.Gasparotti@ugal.ro

Eugen RUSU

Eugen.Rusu@ugal.ro

Dunarea de Jos University, Galati, Romania

Abstract

The Blue Economy is a comprehensive model, which combines the marine and coastal ecosystems with the management of the human activities. This uses tools and mechanisms as the integrated conservation, the sustainable and efficient resource use, ICZM (Integrated Coastal Zone Management) or spatial planning. In this paper, an integrative approach has been proposed for the achievement of a sustainable development. The concept of blue economy is expected to offer efficiency and optimization of the resource use by creating opportunities for a sustainable growth in a number of the traditional and emerging economic sectors, which are considered as Blue Economy key sectors, such as: shipping/port activities, fisheries and aquaculture, coastal tourism, „Blue” energy, biotechnology, submarine mining. Under this approach, we will discuss about the Blue Economy method applied to the Romanian nearshore, by exploring the concepts of the sustainable development, conceptualising the Black Sea as a “developing space” and providing an opening opportunity for the incorporation of the real value of the natural capital.

Keywords: Blue economy, ICZM, Romanian nearshore, sustainable development.

1. Introduction

The global blue economy has a promising climb and its rhythm is estimated to double in size by 2030. Progressive economic activities are often unsustainable and have a major impact on the natural environment. Harmonization of the resource needs is necessary taking into account the protection and rehabilitation of the ocean health. Local and regional authorities must create the institutional framework for the Blue Economy concept to be implemented locally. The provision of the financial and investment resources is done by both public authorities and the private economic community through a combination of Blue Economy activities. Naturally, the blue economy is a model that is based on opportunities. Similarly, any opportunity presents a distinct way of solving problems by offering different solutions. It is a model that is designed to meet people's needs.

As I mentioned in the paper “Identification of the economic pressure on environmental factors in the Romanian coastal zone – case study Eforie”, the Black Sea area is a region considered to be one with a very rich biodiversity. The varied topography determines a range of different landscapes and combines a vast set of coastal and marine ecosystems that offer valuable benefits to its coastal residents. The region has been occupied for a long time and the marine and coastal resources have traditionally supported coastal populations and human uses. The pressures that cause the degradation of the environment, whether we are talking about the anthropogenic or industrial development process, whether we are talking about the agricultural or transport sector, or other causes that spur pressure on natural resources, call into question the need for a sustainable approach. Governmental factors have created various instruments and intervention

mechanisms to balance the pressure on natural factors. Thus, a new concept of "blue economy" has emerged to encourage a shift towards a sustainable economy in the coastal and marine areas.

2. Methodology

According to the “Identification of the economic pressure on environmental factors in the Romanian coastal zone – case study Eforie” study, , we have used specific methodologies known in the field to identify the coastal and maritime sectors. In this way, we have classified the resources as "renewable", such as fishing, and "non-renewable", in which case we have referred to the offshore oil and gas extraction activities using technologies that do not cause irreversible damage to the ecosystem. Similarly, we referred to the commercial activities, marine or coastal tourism activities and, last but not least, to management, protection, surveillance or restoration of the marine and coastal areas.

The Figures [1], [2], [3], [4] and [5] summarizes the types of the activities in the blue economy, industries and related sectors, as well as the economic growth drivers, using a World Bank “BLUE ECONOMY - Increasing Long-term Benefits of the Sustainable Use of Marine Resources for Small Island Developing States and Coastal Least Developed Countries” report.

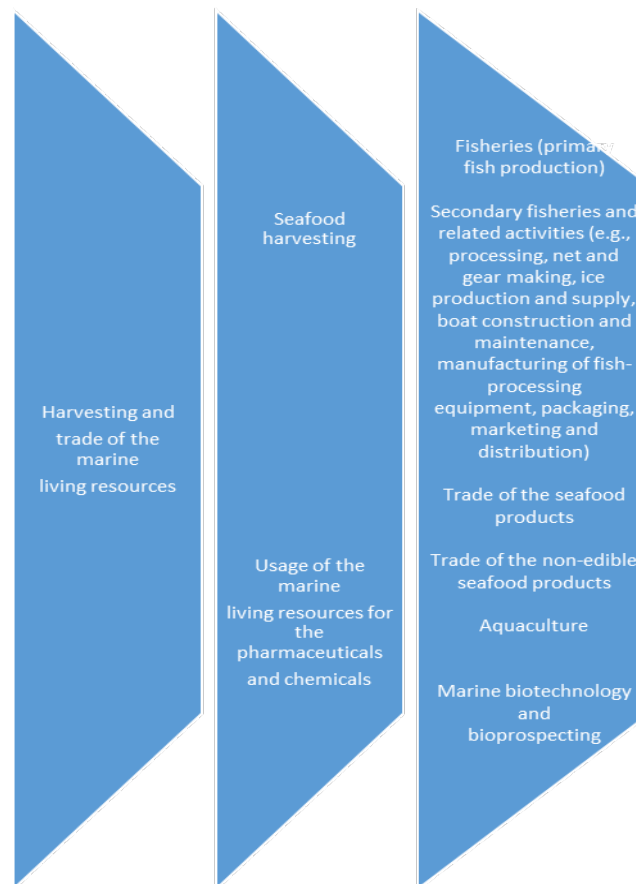


Figure 1. Harvesting and trade of the marine living resources

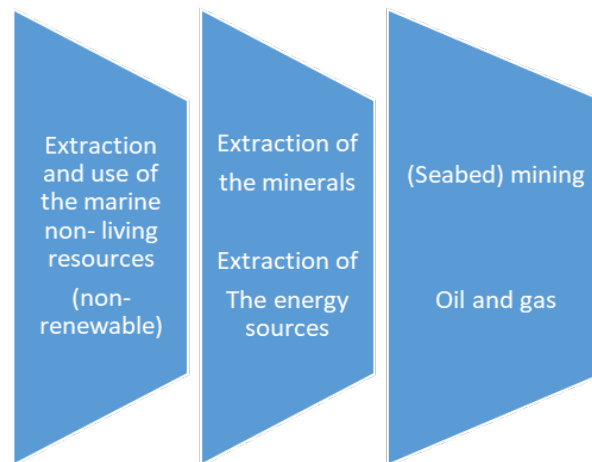


Figure 2. Extraction and use of the marine non-living resources

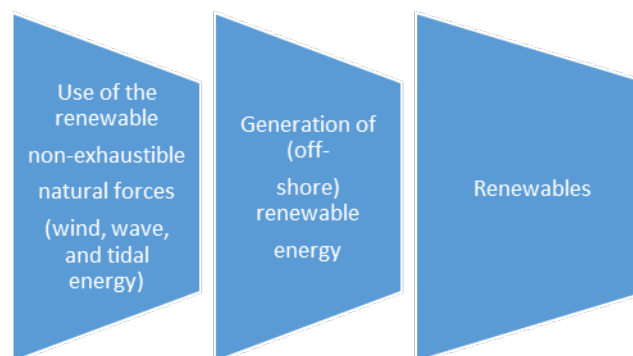


Figure 3. Use of the renewable non-exhaustive natural forces



Figure 4. Commerce and trade in and around the oceans

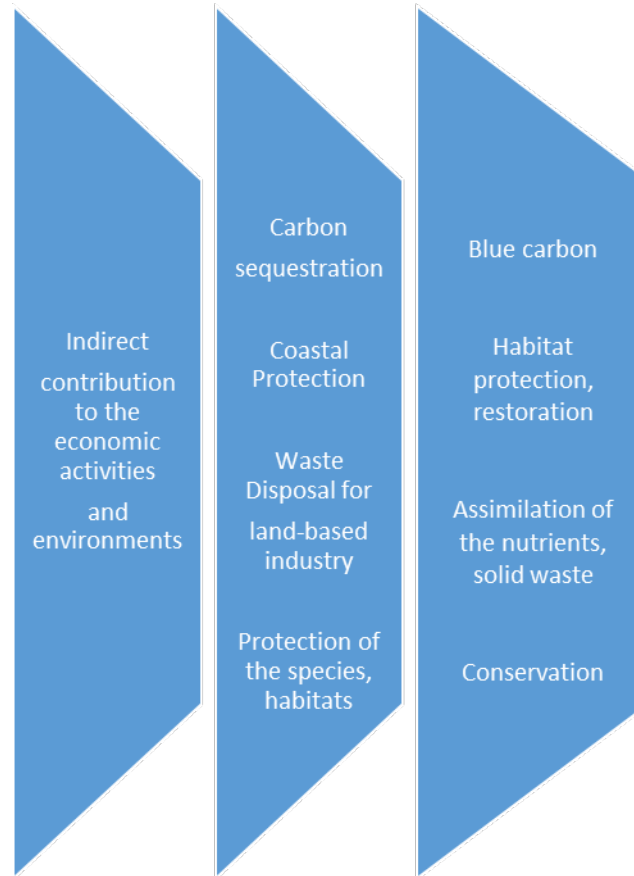


Figure 5. Indirect contribution to the economic activities and environments

Source: World Bank

We analyzed the evolution data from the point of view of the economic growth during the period 2010-2017, $C(a)$, with the indices ranging from -3 to +3, the evolutions or the involutions of the various activities. We also analyzed the likelihood of the economic growth in the period 2018-2022, $C(v)$, taking into account the existence of the development plans, assumed obligations or national or European funds available for the sector concerned.

Thus, in the first phase, a development factor of the respective activity, which we called $F(d)$, was established. The growth factor is the average of the two previous factors, i.e.

$$F(d) = \frac{C(a) + C(v)}{2} \quad (1)$$

The positive or negative value of this factor shows how an activity in the coastal and marine areas will be deployed in the coming period.

All of these analyzes represent only a part of the integration of the activities into the Blue Economy concept. To give sustainability to the activities, we have analyzed each factor in terms of economic, social and environmental impacts, noting also with indices from -3 to +3, the impact on the three factors. Finally we apply formula (2) to determine the sustainability factor $F(st)$, where

$$F(st) = \frac{F(e) + F(s) + F(m)}{3}, \quad (2)$$

where: $F(e)$ is the economic factor,

$F(s)$ representing the social factor,

$F(m)$ representing the environmental factor.

Finally, we set a scale of -3 to +3, for the factor Blue economy

$$F(BE) = \frac{F(d) + F(st)}{2} \quad (3)$$

3. Results

Applying the methodology outlined above, taking into account the activities that lead to the implementation of a blue economy in terms of the economic growth and the forecast for its growth in the next period, as shown in Table 1, we have represented the graph in Figure 6. As we can see, there are activities for which the growth is positive (coastal development) but also activities that are at the coastal management.

Table 1. Economic growth in Blue Economy

Activities	Ca	Cv	Fd
Fisheries	-2	3	0,5
Aquaculture	-3	3	0
Bioprospecting and biotechnology	0	0	0
Extractive industries	0	2	1
Renewable (offshore) energy	0	3	1,5
Maritime transport, ports and related services, shipping and shipbuilding	-2	2	0
Coastal development	2	2	2
Coastal and maritime tourism	-1	1	0
Black Sea monitoring and surveillance	1	1	1
Coastal and marine area management, protection, and restoration activities	-2	1	-0,5
Activities supporting carbon sequestration (blue carbon)	-2	1	-0,5
Waste disposal management	-2	1	-0,5

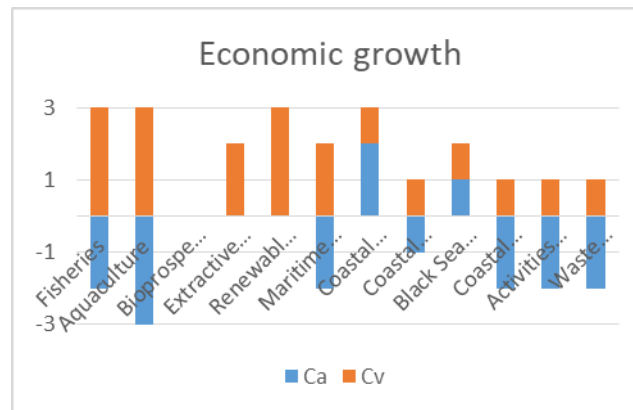
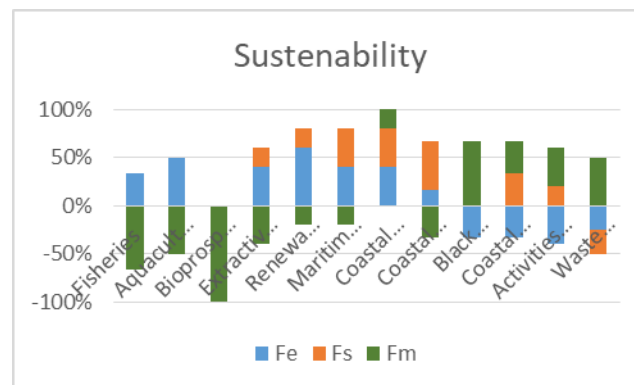


Fig. 6. Economic growth chart

Taking into account the sustainability factors, analyzing the economic, social and environmental factors, the things change substantially, as can be seen in the Table 3. Although many activities have a strong economic or social character, the environmental impact is devastating. If we discuss, for example, the impact of the coastal tourism on the environmental factor, this activity, even if it is seasonal, leaves a strong negative impact. In this context, the measures that the authorities and stakeholders have to take are those of diminishing the impact on the one or other of the factors, so that, in fact, the graph shown in the Figure 7 should be a predominantly positive one.

Table 3. Sustainability table

Activities	Fe	Fs	Fm	Fsu
Fisheries	1	0	-2	-0,333333
Aquaculture	1	0	-1	0
Bioprospecting and biotechnology	0	0	-1	-0,333333
Extractive industries	2	1	-2	0,333333
Renewable (offshore) energy	3	1	-1	1
Maritime transport, ports and related services, shipping and shipbuilding	2	2	-1	1
Coastal development	2	2	1	1,666667
Coastal and maritime tourism	1	3	-2	0,666667
Black Sea monitoring and surveillance	-1	0	2	0,333333
Coastal and marine area management, protection, and restoration activities	-2	2	2	0,666667
Activities supporting carbon sequestration (blue carbon)	-2	1	2	0,333333
Waste disposal management	-1	-1	2	0

**Fig. 7 Sustainability chart**

Finally, we calculated the Blue economy factor using the method described in the Methodology (Table 4). The graphic representation is shown in Figure 8.

Table 4. Blue economy factor table

Activities	F(BE)
Fisheries	0,083333
Aquaculture	0
Bioprospecting and biotechnology	-0,16667
Extractive industries	0,666667
Renewable (offshore) energy	1,25
Maritime transport, ports and related services, shipping and shipbuilding	0,5
Coastal development	1,833333
Coastal and maritime tourism	0,333333

Activities	F(BE)
Black Sea monitoring and surveillance	0,666667
Coastal and marine area management, protection, and restoration activities	0,083333
Activities supporting carbon sequestration (blue carbon)	-0,08333
Waste disposal management	-0,25

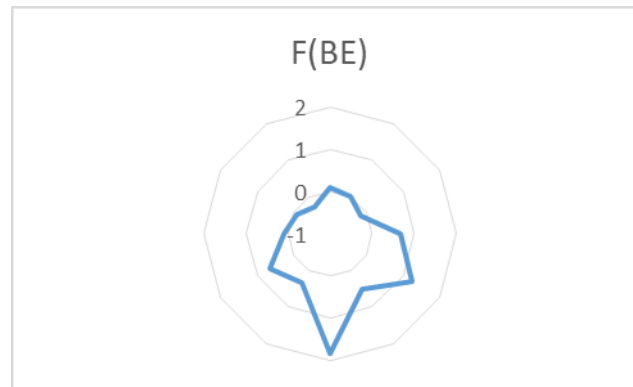


Fig. 8. Blue economy chart

4. Discussions

The concept of "blue economy" is based on the sustained correlation of some activities related to the sea and the coastal area. For example, if we talk about *fishing*, this sustainable activity can be the backbone of a thriving blue economy, with sea fishing contributing over USD 270 billion a year to world GDP (according to World Bank reports 2012b).

And the *aquaculture* sector must be developed based on the principles of sustainable development. Aquaculture and fisheries are activities that need to go together in a prosperous blue economy, with an emphasis on integrated multi-trophic aquaculture, seaweed aquaculture, crustacean aquaculture and well-planned fish growth based on an ecosystem approach.

Capability development and technology transfer in relation to the *marine bioprospecting and biotechnologies* is likely to increase with the ongoing implementation of the Nagoya Protocol to the Convention on Biological Diversity (CBD), under which researchers expect to the market natural products, are bound to share benefits with the host country. Benefits include both monetary and non-monetary benefits; the latter generally consist of the partnerships between the researchers from developing countries and industrial countries, capacity building and the transfer of the appropriate technologies (i.e. the creation of the laboratory facilities in developing countries in the universities). Romania has not taken any substantial steps in this area, and prospects are not encouraging.

The exploration and exploitation of the offshore oil and gas is an activity that is already growing in the world but also in the offshore area of the Romanian coast. If many countries have already learned how to manage the risks involved in these activities and what measures can be taken to alleviate them, Romania is at a very early stage. However, the State has the task of weighing down the trade-offs between these potentially lucrative activities and the extent to which they hamper other uses of the marine resources, including the sustainable exploitation of the living marine resources which is an activity that is already growing in the world but also in the offshore area of the Romanian coast. If many countries have already learned how to manage the risks involved in these activities and what measures can be taken to alleviate them, Romania is at a very early stage. *Sustainable marine energy* can play a vital role in the social economic development as well as in adapting and mitigating the climate change. While the offshore wind energy is becoming more

common, especially in Europe, other forms of the marine energy extraction are still experimental and, in the most cases, not yet developed on a commercial scale. These other forms include the wave and tidal energy and ocean thermal energy conversion. Unfortunately, Romania has not experienced and does not plan on the next period to experience such an activity.

In terms of *Maritime transport, ports and related services, shipping and shipbuilding, Coastal development* and *Coastal and maritime tourism*, these activities have a profound anthropic character. The analysis of these activities shows that they have potential for the economic growth, even from a social point of view, these activities are beneficial. Instead, they put pressure on the environmental factors, and therefore their development must be done in a sustainable manner, taking into account the environmental protection.

Last but not the least, the activities in the panel 3, namely *Coastal and marine area management, protection, and restoration activities, Activities supporting carbon sequestration (blue carbon)* and *Waste disposal management* are related to the environmental factors and mitigation measures to the climate change. These are generally activities that require a longer period of implementation, with additional efforts from the state, but to the extent that there are results, they can only be positive. Coastal management using the existing mechanisms such as ICZM or Marine Spatial Planning is at a stage in which the European Union asks the Member States, like Romania, to put into practice concrete measures. There is some resistance in the application of these measures, but for fear of coercion, these measures will be put into practice. The same is the case for the waste management, a big problem being that of plastic waste in seas and oceans. Solutions and examples of good practice are being sought for these issues to be solved.

5. Conclusions

Challenges affecting the Romanian Black Sea coast require common integrated responses and improved governance, with particular relevance when considering the increasing demands for the natural resources and pressures on the marine and coastal environment. The approach requires a sustainable economic growth that takes into account the economic, social and environmental factors. Economic development so far has been done sectoral, without taking into account the particularities of the marine areas and the impact of the activities on the ecosystem. A "blue economy" means a careful analysis of all factors and an integrated approach to them, so that developing of an activity does not make it to the detriment of another.

In the present work we have extended a model which was analyzed in the paper “Identification of the economic pressure on environmental factors in the Romanian coastal zone – case study Eforie” and attempted to determine a framework at a given moment of the activities in the marine and coastal area, but, at the same time, we have offered a tendency to implement (or not) the mechanisms of the blue economy. Decision makers can use this tool to set the community development priorities at the local, regional or national level.

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