The Priorities of Transport Activities from the Perspective of the Spatial Approach of the Land-Sea Interactions in the Romanian Coastal Area

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Abstract

Maritime spatial planning can play a very useful role in determining the guidelines for the sustainable and integrated management of human activities at sea, the conservation of the living environment, the fragility of coastal ecosystems, the erosion and social and economic factors, when considering land-sea interactions. The analysis and organization of human activities in marine areas are aimed at achieving ecological, economic and social objectives, as well as promoting cooperation between the Member States. This study is part of the MARSPLAN BS II project, in which the authors took part, and it seeks to examine the perception of MSP-interested stakeholders on the most important land-sea and sea-land interactions for river, road, rail and maritime transport activities in the Romanian coastal area, from the point of view of economic, social and ecological priorities. In order to achieve the objectives of the study, a questionnaire was developed that includes the key operational elements in approaching the LSI concept from a two-way perspective: (1) the assessment from land to sea, namely how terrestrial developments influence and support marine developments and the way in which they have an impact on the environment; (2) the assessment from sea to land, i.e., how the sea supports or influences land-based activities, in particular so as to ensure the well-being of coastal communities. The questionnaire designed within the project was administered to the MSP-interested stakeholders, the data collected being aggregated according to the scale on which the activity of the participating organizations (international, local and national) is carried out. The results of the performed analysis are beneficial to the subsequent decisions in MSP regarding the interactions between land and sea for the transport activities in the Romanian coastal area of the Black Sea.

Keywords

Land–Sea Interaction (LSI); transport domains; stakeholders; Maritime Spatial Planning (MSP); Romanian coastal area.

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Introduction

Maritime Spatial Planning (MSP) is the process by which the authorities combine the analysis and organization of human activities in marine areas in order to achieve ecological, economic and social objectives, a process which must take into account land-sea interactions and promote cooperation between the member states (Directive 2014/89/UE).

The coastal area is a space where the interests of land and sea activities merge (O'Hagan, Paterson and Le Tissier, 2020), where the land and the sea interact, being the place where many developments are amalgamated (Schlüter et al., 2020). Therefore, the subject of maritime spatial planning efforts is a key challenge for the spatial management approaches that need to identify where land use affects the sea and how much sea use affects the land (Ehler, Zaucha and Gee, 2019).

Promoting cooperation between the Member States, the European Commission funded in the 2019-2021 period the MARSPLAN BS II project, carried out by Bulgaria in partnership with Romania, a project which

aimed to develop MSP plans at national and regional / cross-border level for the Black Sea area. A part of this project was to conduct a study on land-sea interactions (LSI) by consulting the stakeholders in order to prepare the maritime spatial plans, thus complying with the requirement of the MSP Directive (2014/89/UE).

This study examines the perception of MSP-interested stakeholders regarding the most important land-sea and sea-land interactions for river, road, rail and sea transport activities in the Romanian coastal area, in terms of economic, social and ecological priorities.

1. Review of the scientific literature

The coastal area is the geographical space situated where the sea comes into contact with the land, where there is a high concentration of human activities, having a potential for economic growth and job creation due to maritime and coastal activities which are often closely linked (Directive 2014/89/UE).

The Malta "Maritime Spatial Planning Conference: Addressing Land-Sea Interactions" report (DG MARE, 2017) reiterates the MSP Directive (2014/89/UE), stating that maritime spatial planning can play a very useful role in determining the guidelines for the sustainable and integrated management of human activities at sea, the conservation of the living environment, the fragility of coastal ecosystems, the erosion and social and economic factors, when considering land-sea interactions. Thus, in the context of maritime spatial planning (MSP), the LSI analysis seeks to provide the information needed for a coherent terrestrial-marine planning along the coastal interface (SUPREME, 2018), so as to promote the sustainable use of maritime space.

Maritime Spatial Planning (MSP) is an effective tool for reconciling human activities and environmental values (Tolvanen, Erkkilä-Välimäki and Nylén, 2019), and the analysis of land-sea interactions (LSI) must be taken into account in the planning process for the identification of the key elements linking the terrestrial and marine components of the coast.

Within the European Union, transport is a strategic sector of the economy, and there is a desire to create a "blue zone" in order to speed up the transition from road transport to maritime transport, the development of maritime space being a necessary measure for managing the growing number of maritime and coastal activities, as well as for the protection of the marine environment.

The transport sector is one of the important economic sectors, but also a major source of pressure on the environment. Recent research reveals the importance of maritime transport both from a socio-economic and from an environmental perspective (Niavis et al., 2017), this sector being an essential component of the economic system that plays a key role in the import and export of resources, as well as in providing employment opportunities (Yan et al., 2021). Moreover, the river and rail modes of transport, along with road transport are an integral part of economic activity and are, therefore, essential for its development (Alonso de Armiño et al., 2022).

The transport sector is a key economic activity in the coastal zone, with relevant social and environmental implications. In their research paper Lee, Noh and Khim (2020) examine the challenges and opportunities of the Blue economy, pointing out that it has two competing modes: growth and development opportunities and threatened and vulnerable areas in need of protection. Therein lies the importance of studying coastal areas, which is justified by their resources, the ecosystem services and the key role played in socio-economic development (Petrişor, et al., 2020).

On the other hand, the MSP Directive (2014/89/UE) states that it is essential for the stakeholders, authorities and public to be consulted in order to promote sustainable development effectively. Moreover, expert consultation can also be integrated as a part of the stakeholders' involvement process, helping create knowledge and information based on scientific foundations and reasoning (Calado et al., 2021), while the exchange of information plays an important role in the development of beneficial relationships in the process of maritime spatial planning (Stan et al., 2021a).

Recent studies on maritime spatial planning (MSP) reveal that, although it remains a complex and challenging process, despite the experience gained over the last decade (Ansong, Calado and Gilliland, 2021), still it has become the preferred planning process for determining what, where and when human activities should take place in the marine areas (Ehler, 2021), thus contributing to the efficient management of maritime activities and the sustainable use of marine and coastal resources. Unfortunately, the permanent legislative changes, as well as the indecision of the Romanian political factors (Stan and Vancea, 2014; Vancea, Aivaz and Duhnea, 2017) have led to a completely inefficient policy in this area. We can add the lack of vision in terms of the allocation of government funds, the structuring of projects that would lead to

the implementation of the obtained results from the consistent research carried out in recent years in support of the implementation of an appropriate legislation (Vancea and Duhnea, 2013).

From this point of view, both Romania and Bulgaria must be interested in structuring a set of public policies that address all the categories of resources and ensure adequate funding, taking into account certain economic indicators and their impact on savings. In this context, i.e., of the concerns regarding financial resources, specialized literature has paid interest to the examination of some macroeconomic indicators (Aivaz and Condrea, 2012), a particularly important aspect in the context of the concerns about a long-term sustainable development.

However, maritime spatial planning remains one of the key tools for achieving a sustainable blue growth and facing its challenges (EASME, 2018), leading to the gradual imposition of a coherent, transparent, sustainable, evidence-based framework for decision-making.

2. Research methodology

The aim of this paper is to carry out an assessment of stakeholders' perceptions of land-sea interactions for transport activities in the Romanian coastal area of the Black Sea, in order to identify the significant aspects of promoting an integrated approach of maritime spatial planning.

Within the MARSPLAN BS II project, for the implementation of Activity 2.3 "Integration of Land-Sea Interactions (LSI) in MSP for the cross-border region" a questionnaire was designed by the representatives of the National Institute for Marine Research and Development "Grigore Antipa". The partners involved in the project administered to the interested parties the online questionnaire, which was then interpreted by the authors from "Ovidius" University in Constanța involved in the MARSPLAN BS II.

The need to develop a broad understanding of LSI issues among both terrestrial and maritime stakeholders and the need to promote land and sea planning and management integrated approaches must be taken into account when tackling LSI (DG MARE, 2017). Thus, the Land and Sea Interaction (LSI) analysis methodology is the result of experiences and tools of some pilot projects carried out in Europe and it consists of a process with various stages and levels, namely: an initial and more general inventory phase, followed by an in-depth analysis of the most relevant interactions and a final phase aimed at informing the planning process about the key results of the LSI analysis (SUPREME, 2018).

Thus, in order to achieve the objectives of the research, we have used a questionnaire necessary for the field of maritime spatial planning, by taking into account the interactions and the reciprocal land - sea impact. The key operational elements in tackling the concept of LSI included a bidirectional perspective: (1) the assessment *from land to sea*, namely how terrestrial developments influence and sustain marine developments and how they affect the environment; (2) the assessment *from sea to land*, i.e., how the sea supports or influences land-based activities, especially so as to ensure the well-being of coastal communities. The processing of the questionnaire prepared so as to clarify these issues was achieved by grouping the variables-questions according to the scale at which the activity of the participating organizations (inter-national, local and national) unfolds, these being MSP-interested stakeholders. From a methodological point of view, this assessment has been performed for each identified activity, by establishing the ecological, economic and social value, using a numerical set from 3 to 0. For each type of answer, the assessment of *ecological priority*, *economic priority* and *social priority* is defined by the score value, as follows: High (score 3), Medium (score 2), Low (score 1) and Not Known (score 0). The data processing, the systematization of the results, as well as obtaining the indicators used for the statistical analysis were achieved using the Statistical Program for the Social Sciences (SPSS).

3. Results and discussions

The transport infrastructure in the Romanian coastal area comprises the transport networks consisting of roads, railways, air transport, river transport on the Danube River and the Danube-Black Sea Canal and the maritime transport on the Black Sea.

Within MARSPLAN-BS II, a project aimed at developing a common MSP strategy that should lead to the drafting of MSP plans, the analysis of land-sea interactions (LSI) explores the possibilities of identifying and practicing on important aspects of LSI in the cross-border region of Bulgaria and Romania (Stancheva and Stanchev, 2021).

For the analysis carried out in this article, from the complex questionnaire applied to the stakeholders, which targeted the most relevant activities taking place in the Romanian coastal area, the questions on river,

road, rail and maritime transport activities were selected. The stakeholders identified and surveyed were entities from sectors of activity relevant to the use of marine space (public authorities, economic agents, non-governmental organizations, research institutes and universities, public companies, etc.) whose activity is carried out at different levels - international / national / local.

Thus, the evaluation of the way in which terrestrial developments influence and support marine developments and the way in which they have an impact on the environment in terms of *river, road and rail transport activities* were scored by the interested parties (Figure no.1) according to their specialized knowledge and interests that are influenced by maritime spatial planning.

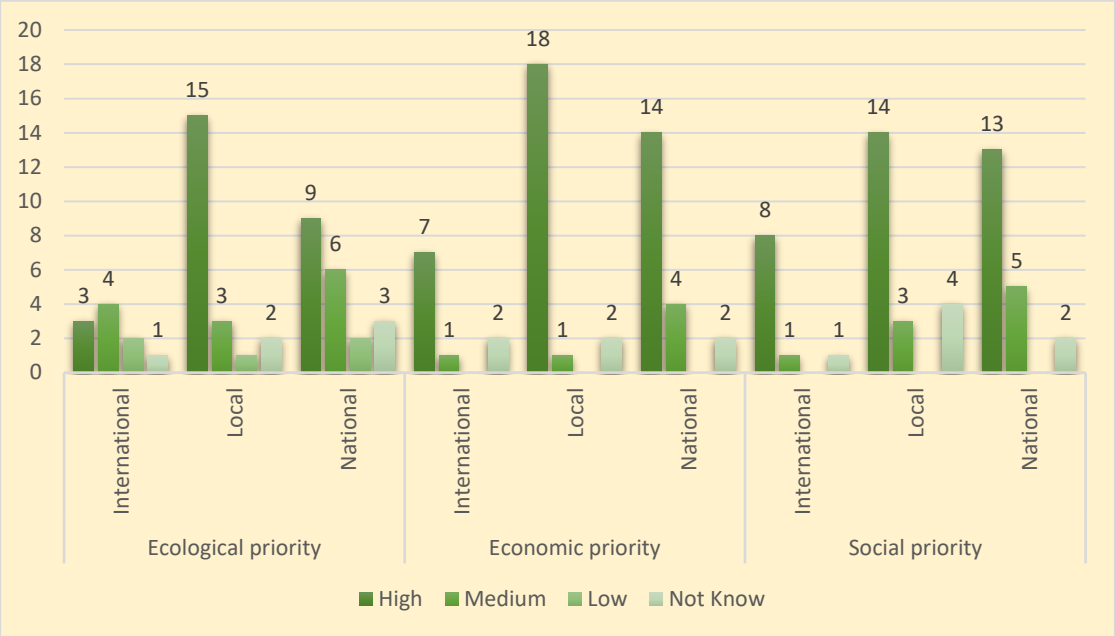

Figure no. 1. River, road, rail transport
Source: Authors' own research

According to the data analysis, regardless of the scale at which the activity of the responding organization is carried out (international, local, national), the river, road, rail transport activities are considered an *ecological priority*, obtaining the following scores: 52.90% - High, 25.50% - Medium, 9.80 % - Low and 11.80% - Not Known. It is well known that, at European Union level, transport is a source of pollution, therefore the recommendations are to redirect long distance road transport to other environmentally friendly modes of transport, such as rail or river or sea transport. However, local entities consider these activities to be an ecological priority in a proportion of 71.40%, which shows the concern of the local community about improving the behaviour of transport in relation to its environment in terms of climate change and environmental quality.

Regarding the extent to which the surveyed organizations consider the river, road and rail transport activities as an *economic priority*, the following scores resulted: 76.40% - High, 11.80% - Medium, and 11.80% - Not Known. The Romanian coastal area, through the Constanța and Tulcea Counties, has a good connectivity due to the diversified transport infrastructure (port, airport, railway, highway, roads with access to the TEN-T infrastructure), which also supports the development of other economic sectors. Thus, the 64 km long Danube-Black Sea Canal, which shortens the navigation to the port of Constanța by 300 km and the infrastructure of the Pan-European Corridor IV (road, rail) and Corridor VII (Rhine-Main-Danube) are important assets for economic, social and entrepreneurial environment development. The opinion expressed by the stakeholders confirms the fact that the sustainable economic development of these activities can generate new opportunities for job creation, which could generate added value from an economic perspective in the Romanian coastal area (Mirea and Aivaz, 2016; Munteanu Florea and Aivaz, 2017).

The organizations surveyed regarding the *social priority* of the river, road and rail transport activities gave the scores according to the following structure: 68.60% - High, 17.60% - Medium and 13.80% - Not Known. It can be noticed that the international level entities gave a high score to this criterion, of 80.00%, which indicates their concern about a balanced development of the transport services market under competitive conditions, while respecting the rules on working conditions in this section. Although the transport sector accounts for a significant share of the workforce, recent studies (Lincaru, Grigorescu and

Pîrciog, 2021) indicate that, post-Covid, this sector is expected to shrink, productivity growth and innovation adoption being reduced, and the quality of jobs lowered.

The way in which river, road and rail transport activities can influence and sustain marine developments and have a positive impact on the environment is to make public and private investment in sustainable transport, in order to help their economies find new sources of growth and bring benefits in the region.

The assessment of how the sea supports or influences land-based activities, especially in order to ensure the well-being of coastal communities in terms of *maritime transport activities*, was scored by the stakeholders (Figure no. 2) according to their expertise, information and interests which are affected by maritime spatial planning.

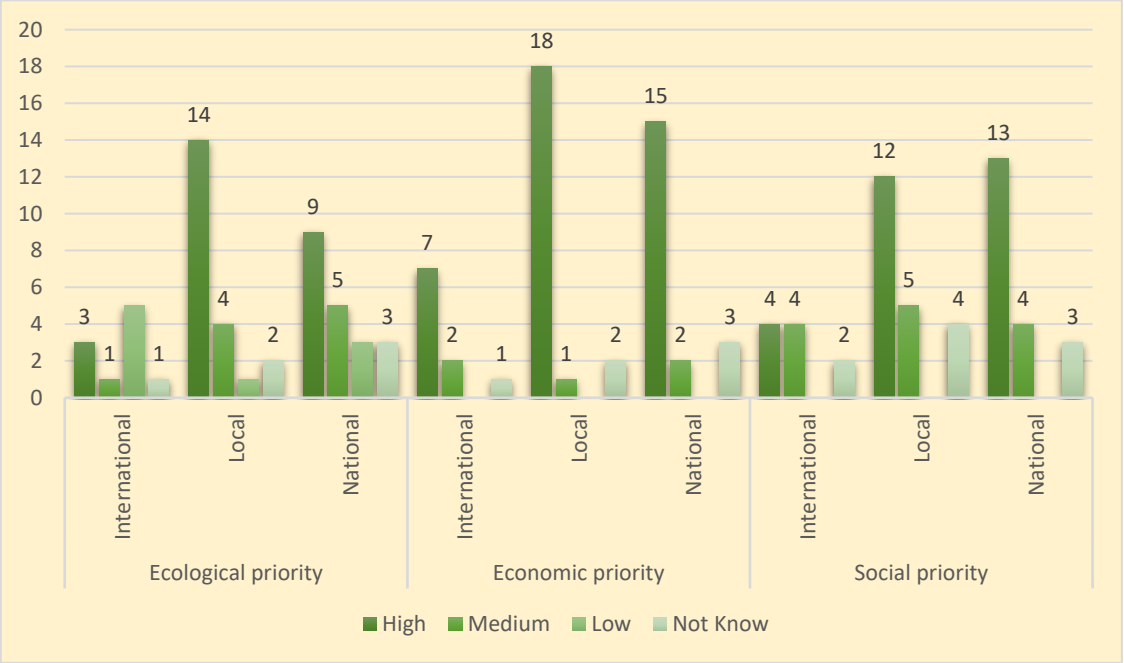

Figure no. 2. Maritime transport
Source: Authors' own research

According to the analysis carried out based on the questionnaire, regardless of the scale at which the activity of the responding organization (international, local, national) unfolds, maritime transport activities are considered an *ecological priority*, the distribution of the scores being as follows: 51.00% - High, 19.60% - Medium, 17.60% - Low and 11.80% - Not Known. Maritime transport has a strong impact at the boundary between land and sea, a major impact on the environment being represented by the potential accidents and oil spills of the ships (Stancheva and Stanchev, 2021), interactions due to human activities and uses. This assessment of the stakeholders regarding the environmental issues emphasized by the maritime transport activity shows that ecosystem services need to be integrated into planning decisions, which can make a significant contribution to achieving a good ecological status in the Black Sea (Stan et al., 2021b), thus removing the problems caused by the harmful effects of the polluted environment on human health for the communities in the Romanian coastal area.

The port activity is marked in the Romanian coastal area by the existence of the seaports of Constanța, Mangalia, Midia (in Constanța county) and Sulina (in Tulcea county). The port of Constanța is both a seaport and a river port and it benefits from an advantageous geographical position, being located on the pan-European Rhine-Danube transport corridor. The port of Constanța provides good connections with all the modes of transport: rail, road, river, air and pipelines.

Regarding the assessment of the *economic priority* of the maritime transport activity, the surveyed entities made the following assessments: 78.40% - High, 9.80% - Medium and 11.80% - Not Known. As can be seen, the perception of the stakeholders is relevant because, at present, maritime transport covers about 90% of the world trade. At the level of the Romanian coastal area, the marine waters' transport activity has a high economic priority due to its contribution to the socioeconomic development of Constanța County by supporting other economic sectors and generating jobs, the Port of Constanța being one of the main distribution centres serving the Central and Eastern Europe region. Niavis et al. (2017) argue that the activities carried out in marine and coastal areas shape a type of economic sector – the maritime transport,

which could be considered Europe's "Blue Economy". Furthermore, the entities at the local level give a high score to this criterion, in a percentage of 85.70% considering it a high priority. In this sense, in order to capitalize on the existing potential and the sustainable development of the coastal area, it is necessary to modernize transport infrastructure, the public investments needing to be much more energetic (Filip, Stan and Vintilă, 2016) and to serve mainly local economic development.

Regarding the extent to which maritime transport activities are a *social priority*, the distribution of the stakeholders' results regarding the perception of this priority are: 56.90% - High, 25.50% - Medium and 17.60% - Not Known. This view expressed by MSP-interested stakeholders can be explained by the fact that urban and rural coastal communities pose different social problems: tangible disparity between the standard of living of the different segments of the population associated with poverty, unemployment and increasing numbers of socially vulnerable people. Thus, if at the level of the urban center of Constanța the economic development due to the maritime transport activity is easily observed, at the opposite spectrum is the community of the town of Sulina where the local economic life is almost non-existent outside the port and tourist activities.

Therefore, the way in which the maritime transport activities influence land activities, especially in order to ensure the well-being of the coastal communities is perceived differently at the level of the Romanian coastal area, due on the one hand to the heterogeneous local interest groups who have different concerns and knowledge and, on the other hand, to the local government decisions on key political, administrative and legislative issues.

Following the SUPREME approach (2018), adapted for the prioritization of LSI at the level of the Romanian coastal area, from the analysis of the scores of land-sea interactions for river, road, rail and maritime transport activities it can be seen that the problems due to pressures and environmental impact, as well as the economic and social effects of these activities are comparable with those of the Bulgarian partners (Stancheva and Stanchev, 2021).

As a result, in order to achieve an efficient management of maritime activities and the sustainable use of marine and coastal resources, the information, knowledge and experiences of the stakeholders must be integrated into the elaboration of the MSP plan. Thus, given the potential and emerging issues given by the specific development of the Romanian coastal area, it is absolutely necessary to involve the stakeholders in maritime spatial planning because they sometimes provide information, data, solutions, opinions and complex recommendations that can be incorporated into the scientific research of the domain.

Conclusions

Therefore, the trimodal proposal in the field of transport (road and rail transport, and water transport - river and maritime transport) in the Romanian coastal area contributes to the development based on the three traditional pillars (economic, social and environmental) in the Black Sea cross-border region (Filip, Stan and Vintilă, 2016), offering new opportunities to this region. Consequently, in the context of the sustainable development of activities in the marine and coastal space of the Black Sea, it is necessary to know the priorities of transport activities from the perspective of the spatial approach of land-sea interactions (LSI).

Even though ambiguity can also be seen as to what MSP can or should tackle (Mayer et al., 2013), in the last two decades, marine spatial planning has matured from a concept to a practical approach of the transition to sustainable sea development and a 'blue economy' (Ehler, 2021).

Given that decisions in the MSP can change the opportunities of marine, as well as terrestrial sectors, just as much as structural changes in other economic sectors can change the context and needs for MSP decisions (Weig and Schultz-Zehden, 2019), future research in the field must also identify the needs of other sectors, as they may be important both for the planning process itself and for mobilizing these stakeholders.

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