

## Why Should Fisheries and Agriculture Be Considered Priority Domains for Maritime Spatial Planning in the Black Sea? A Stakeholder Perspective

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### Abstract

*The European Maritime Spatial Planning Directive 2014/89/EU requires that to promote sustainable and integrated development and to optimally manage human activities at sea, land-sea interactions (LSI) should be taken into account. In the context of preparing the national maritime spatial plan, this study analyzes the perception of stakeholders in Maritime Spatial Planning (MSP) regarding the most important interactions and the reciprocal impact of the land and sea in the Black Sea area for maritime fishing activities, aquaculture, coastal fishing, agriculture and animal husbandry. The analysis was based on a questionnaire answered by 51 stakeholders with activities in sectors relevant to the use of marine space and carried out at different levels - international/national/local -, stakeholders being entities such as authorities, economic operators, non-governmental organizations, universities, and research institutes.*

**Key words:** Land–Sea Interaction (LSI), fisheries and agriculture domains, stakeholder, Black Sea, Maritime Spatial Planning (MSP)

**J.E.L. Classification:** O20, R10

### 1. Introduction

In the European Union, maritime spatial planning (MSP) is considered an important tool for the sustainable development of marine areas and for ensuring the sustainable coexistence of uses and, where appropriate, the proper distribution of maritime space between the intended uses, the member States must draw up and implement a maritime spatial planning plan (Directive 2014/89/EU).

In Romania, the European Maritime Spatial Planning Directive 2014/89/EU is currently being implemented by Law no. 88/2017, approved by Government Ordinance no. 18/2016 on the arrangement of the maritime space. Article 14 para. (1) of H.G. no. 436/2018 defines the maritime spatial plan as a strategic document of a managerial and regulatory nature, which identifies the spatial and temporal distribution of current and future activities and uses in marine waters and establishes the general framework for sustainable and integrated development of different sectors in marine waters.

To support the implementation of Directive 2014/89/EU of the European Parliament and the Council establishing a framework for maritime spatial planning, the European Commission has approved and funded the project “Cross-border Maritime Spatial Planning for Black Sea - Bulgaria and Romania (MARSPLAN- BS-II)” which aims to support coherent activities on maritime spatial planning in the Black Sea cross-border area - Romania, Bulgaria. A requirement of the MSP Directive (2014/89/EU) is that the Member States of the European Union should take into account

land-sea interactions (LSI) when preparing their maritime spatial plans. The report “Maritime Spatial Planning Conference: Addressing Land-Sea Interactions” in Malta (DG MARE, 2017) stated that the options for addressing LSI may be different in MSP, with each Member State having to decide individually on possible ways to address LSI when conducting MSPs, but should also consider cross-border context and issues.

On the other hand, the inherent complexity of offshore planning, called maritime spatial planning (MSP), requires a planning approach in which science - data and evidence - and stakeholders - their commitment and involvement - are integrated throughout the planning process (Jean *et al*, 2018, p.1). Thus, the MARSPLAN-BS-II project explores the possibilities of identifying and analyzing important aspects of land/sea interactions (LSI) for the Romanian coast and in the Black Sea, in the cross-border region of Bulgaria and Romania, through the public consultation of relevant authorities.

This study analyzes the perception of MSP stakeholders regarding the most important interactions and the reciprocal impact of land-sea in the study area for sea fishing, aquaculture, coastal fishing, agriculture, and animal husbandry.

## 2. Literature review

Maritime Spatial Planning (MSP) is an integrated framework to support the sustainable development of activities while seeking to increase efforts to conserve the marine environment (Dupont *et al*, 2020, p.1). It is a public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve the ecological, economic, and social objectives that have been specified through a political process (Directive 2014/89/EU). Thus, the imperative for using a multidisciplinary approach to maritime spatial planning comes from the nature of marine space as a multidimensional concept that requires a vision of many scientific disciplines and types of knowledge (Ehler, Zaucha, and Gee, 2019, p.2).

Maritime Spatial Planning (MSP) should aim to "integrate the maritime dimension of some users or coastal activities and their impact and, ultimately, allow for an integrated and strategic vision". In this regard, eight of the most typical marine development sectors of land-sea interaction (LSI) have been identified to be considered in the MSP process: aquaculture, desalination, fisheries, marine cables and pipelines, minerals and mining, ports and shipping, tourism, and coastal recreation, offshore energy (European Commission, 2018, p.1).

At the EU level, the *Common Fisheries Policy* (CFP) guarantees that fishing and aquaculture activities ensure long-term sustainable environmental conditions and are managed consistently, taking into account the objectives of achieving economic, social, and labour force employment benefits, to contribute to the availability of food supply (Article 2 of Regulation (EU) No 1380/2013). At the same time, the development of the agricultural sector is strongly influenced by the European Union's *Common Agricultural Policy* (CAP), as agriculture has a special status in Europe.

Marine resources play a vital role in social and economic development, and industries such as fishing and agriculture benefit from them (Ansong, Gissi, and Calado, 2017, p.65), MSP offering a much more promising approach to implementing ecosystem-based management (Crowder and Norse, 2008, p.772). In this context, the fields of fishing and agriculture, basic economic activities in the Romanian coastal area, require balanced and integrated management, because the sustainable development of the Romanian Black Sea coastal area is a complex and sensitive issue that must take into account the interactions between economic, environmental, and social factors (Stan, 2014, p.56; Filip, Stan, and Vintilă, 2016, p.524). Moreover, the coastal area must be seen as a multifaceted concept and which, in addition to the mentioned dimensions, also has a territorial one (Petrișor, 2014, p.27; Munteanu, 2020, p.973). Practically the concept of sustainability covers all areas and sectors in which a development process takes place (Petrișor, 2017, p.144).

The economic activities of fishing and aquaculture, as well as agriculture, represent a socio-economic necessity for the sustainable development of the Romanian coastal area. Fishing is the activity of extracting living aquatic resources from natural fish habitats, in compliance with measures for the protection, conservation, and regeneration of living aquatic resources; aquaculture deals with the growth or cultivation of aquatic organisms using techniques designed to increase the production of the organisms concerned beyond the natural capacity of the environment, in a framework in which those organisms remain the property of a natural or legal person throughout the growing/cultivation

and harvesting period, while agriculture is concerned with the cultivation of plants and the raising of animals to obtain food and raw materials.

In the Black Sea coastal area, on the Danube and in the Danube Delta, an important part of the population has as its traditional activity fishing, which has both a social and economic role and provides food resources. Also, agriculture and animal husbandry are a traditional sector in Constanța County, while for Tulcea County only agriculture continues to be the main branch of the economy, especially in rural areas; although fish farming and aquaculture have a high potential for development, they are ahead of agriculture. All these activities involve several relevant actors: fishermen, aquaculturists, farmers, animal breeders, processors, farmers, cooperatives, companies.

There are studies and analyses in the literature that examine fishing in the context of MSP, focusing on the relationship between MSP and fishing, the involvement of fishermen in MSP, and tools that can help integrate fishing into MSP (Psuty *et al*, 2021, p.1). Other studies show that relevant agricultural stakeholders can create an integrated European cross-sectoral and multidisciplinary maritime policy (Salomon and Dross, 2013, p.144).

To be able to identify the important aspects of land / sea-land interactions (LSI) for the coastal and maritime area of the Black Sea to develop and implement the maritime spatial plan, the involvement of relevant stakeholders is necessary. Recent studies (Zaucha and Kreiner, 2021, p.1) have shown that there are many benefits of stakeholder involvement in the effectiveness of the MSP process, as expert consultation or involvement can be integrated into the complex process of spatial planning (Calado *et al*, 2021, p.2). Intuiting the importance of agriculture, fisheries, and aquaculture from an economic point of view, to get a clear picture of how companies in this field achieve their intended purpose and contribute to the economic benefit of the area, a series of studies (Aivaz, 2021a; Aivaz, 2021b; Aivaz, 2021c) performed structural and dynamic analyzes of the most important financial indicators of results.

### **3. Research methodology**

The research aims to assess the perception of stakeholders regarding the interactions between land and sea in the Romanian coastal area of the Black Sea in terms of their priorities, to identify relevant issues in the fields of fisheries and agriculture which must be taken into account in maritime spatial planning in the Black Sea.

To achieve the research objectives we used a questionnaire, the variables-questions aimed at clarifying the aspects that include the two components related to (1) interactions with impact from shore to sea and (2) interactions from sea to land and refers both to economic activities as well as natural phenomena and processes. Within the MARSPLAN II project, the questionnaire was developed by the representatives of the National Institute for Marine Research and Development "Grigore Antipa" and was applied and interpreted by the representatives of Ovidius University of Constanta. The questionnaire was applied online to stakeholders, who are both public and private entities.

The grouping of the variables in the questionnaire was carried out according to the scale at which the activity of the participating organization takes place: international, local and national. From a methodological point of view, the assessment of how terrestrial developments influence and support marine developments and how they have an impact on the environment was carried out for each activity in the field of fisheries and agriculture by setting priorities grouped into 3 categories: *ecological priorities*, *economic priorities*, and *social priorities*. For each answer, in our case, the assessment of the priority by the entity in question, we used a scale from 1 to 5 with the following meanings: Maximum (score 1), Medium (score 2), Low (score 3), Non-existent (score 4) and I don't know / I don't answer (score 5). Data processing, systematization of results, and obtaining indicators used for statistical analysis were performed using the *Statistical Program for the Social Sciences* (SPSS).

#### 4. Findings

For the analysis undertaken in this study, questions from marine or coastal fisheries, aquaculture, and agriculture and animal husbandry were selected from the complex questionnaire for stakeholders covering all coastal activities. All these activities are, according to the CANE classification, part of a compact field of activity entitled "Agriculture, forestry, and fishing".

The questionnaire was answered by 51 stakeholders from sectors of activity relevant for the use of marine space whose activity is carried out at different levels - international/national/local -, the stakeholders being entities such as authorities, economic operators, non-governmental organizations, universities, institutes of research, public companies, etc.

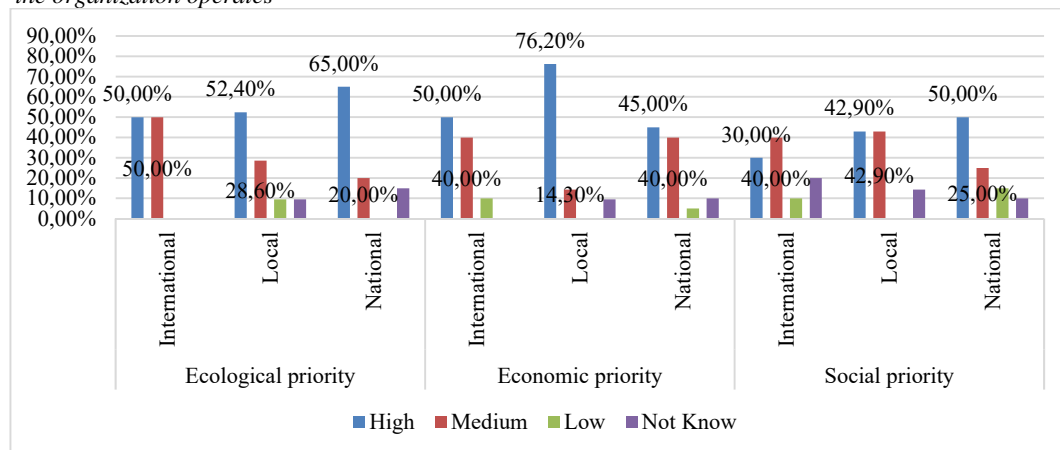
Having up-to-date information and understanding the specifics of sea fishing activities are key components and key elements in maritime spatial planning (MSP). Marine fishing is carried out along the Romanian coastline and is limited to the marine area located up to the isobath of 60-70 m and on the seaside of the Danube Delta Biosphere Reserve.

According to the data analysis, regardless of the scale at which the organization operates, sea fishing is considered an *ecological priority* of the highest level by 56.9% of the entities, while 29.4% consider it a medium priority, 3.9% low, and 9.8% do not know. The high score given to this criterion is because fishery resources in European inland waters are in continuous decline, as a result of habitat degradation and overexploitation through fishing, the Romanian coastal area being an area of great ecological importance, because some of the most productive habitats are concentrated there. In Romania, the analysis carried out for the *Aquaculture and Fisheries Program 2021-2027* confirms that the precarious state of the Black Sea stocks endangers the sustainability of commercial fishing and the entire ecosystem.

Regarding the extent to which the surveyed entities consider fishing as an *economic priority*, the following scores resulted: 58.8% High, 29.4% Medium, 3.9% Low, and 7.9% Not Known. From an economic point of view, this sector includes commercial fishing activities, fishing vessel activities, fish processing, and preservation activities, with a high degree of relevance for the development of fishing communities and it is not surprising why almost 60% of the surveyed entities considered this activity to have a high economic impact. Among the economic problems raised by them, most of them refer to the underdeveloped infrastructure represented by fishing ports with non-specialized berths, inadequate storage spaces, as well as the lack of suitable locations for organizing the first sale of fish, that of the direct producer.

Regarding the appreciation of sea fishing as a *social priority*, the following scores resulted: 43.1% High, 35.3% Medium, 7.8% Low, and 13.7% Not Known. The high score given to this criterion is because a large number of people from coastal localities work and depend on income from this sector, thus providing the necessary livelihood. People working in related sectors, such as fish processing, ship maintenance, and tourism, also indirectly depend on this area of sea fishing.

Figure no. 1. The extent to which sea fishing can be considered a priority depending on the scale at which the organization operates



Source: Own processing

Although aquaculture is the fastest-growing food industry in the world, its development is largely conditioned by the existence of a coastal area close to the coast. The biggest problems they face are the lack of clear planning policies and strategies at both the European Union and national levels. Hence, it is necessary to develop a maritime planning strategy that can identify suitable sites for the expansion of aquaculture, without compromising areas important for biodiversity and other socio-economic uses in the region (Venier *et al*, 2021, p.2).

The aquaculture activity confirms its importance in the Romanian coastal area by the fact that large areas are concentrated for its development, the potential of the field being supported by the existence of resources from the Danube Delta and the Black Sea. Although marine aquaculture, called mariculture, is a recent activity in the Black Sea, the potential economic benefits have made it necessary to know the perception of stakeholders on this activity for its future development and to minimize possible conflicts.

Regarding aquaculture, regardless of the scale at which the activity of the organization is carried out, 56.9% of the entities considered it a high *ecological priority*, 25.5% average, 3.9% low and 13.7% said that they do not know. Stakeholders believe that ecologically conserving marine biodiversity requires special attention, even if the activity has a high potential for economic growth.

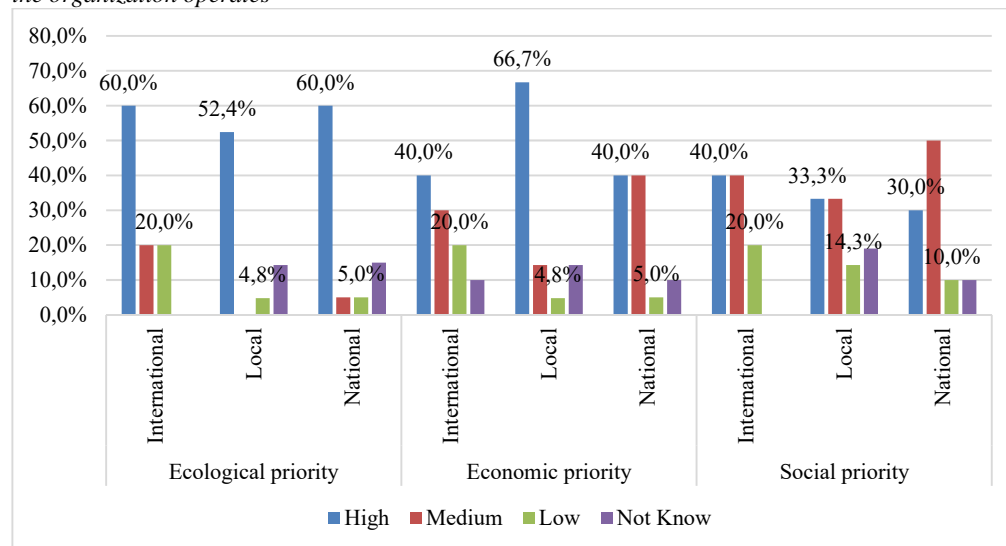
The distribution of the results regarding the assessment of the *economic priority* of aquaculture is as follows: 51.0% of the entities consider it a high priority, 29.4% average, 3.9% low and 7.9% stated that they do not know. One of the directions that should be taken into account in the development programs, to cover the demand for cultivated species in Romania and maximize the production potential, is to support the growth and diversification of production, especially from local ichthyofauna species, including mariculture.

Regarding the appreciation of aquaculture from the perspective of *social priorities*, the following relative sizes resulted: 33.3% of the entities consider this category to be with high social priority, 41.2% average, 9.8% low and 15.7% do not know. The role of the social component of this activity must be emphasized because aquaculture is one of the directions that will drive the balanced development of rural and coastal areas.

The *Aquaculture and Fisheries Program 2021-2027* mentions and encourages investments in sustainable aquaculture infrastructure, as it recognizes its potential to contribute to sustainable development, food security, economic growth, and employment.

Therefore, the inclusion of the views of the stakeholders in the maritime spatial planning activity is essential, as it provides investors with certainty in avoiding conflicts, so that all actors involved enjoy the ultimate goal - sustainable development.

Figure no. 2. The extent to which aquaculture can be considered a priority depending on the scale at which the organization operates



Source: Own processing

The fishing activity in the coastal lakes from the Romanian coastal area takes place in the Razim-Sinoe lagoon complex, the Taşaul-Gargalâc lake complex, the Siutghiol-Tăbăcărie lake complex, the Agigea, Techirghiol, Costinesti, Tatlageac lakes, the swamps near Mangalia, important areas in the natural ecosystem.

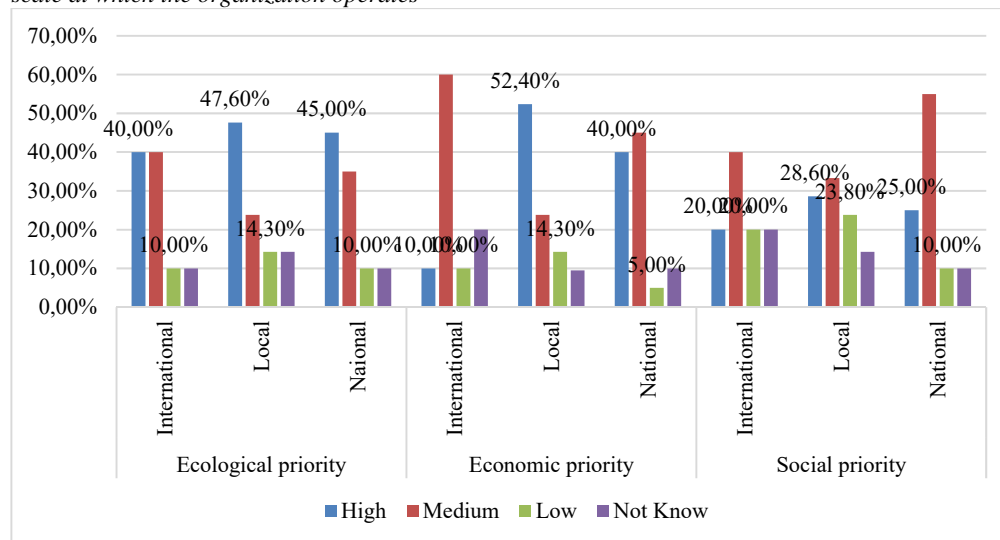
The guidelines analysis of the stakeholders regarding the fishing activity in the coastal lakes is necessary for the maritime spatial planning because this is an activity with a long tradition, an important part of the population having as its traditional activity the fishing.

According to the data analysis, regardless of the scale at which the organization operates, fishing in coastal lakes is considered an *ecological priority*, the distribution of scores being as follows: 45.1% of entities consider it to have high priority, 31.4% average, 11.8% low and 11.7% do not know. Coastal lakes are most severely affected by human activities, with severe pressures leading to the deterioration of aquatic ecosystems over time. In this regard, the management of waste, including that generated by commercial or recreational fishing activities, the use of prohibited or non-selective fishing methods, non-recovery of lost gear, etc. these are issues that should be put on the agenda of decision-makers.

Fishing in coastal lakes is considered an *economic priority* by the interested entities in the following structure: 39.2% of them consider it a high priority, 39.2% medium, 9.8% low and 11.8% do not know. Most of the responding stakeholders consider fishing in coastal waters as having a high economic priority, due to the existence of living aquatic resources which have a high economic value and can generate added value. However, the seasonal nature of coastal fishing cannot provide a permanent source of income for traditional fishing communities, which severely limits interest in this activity.

Fishing in coastal lakes is considered a high *social priority* by 25.5% of stakeholders, 43.1% consider it a medium level, 15.7% low and 15.7% do not know. In coastal lake communities, especially in rural areas, fishing is a subsistence activity, so it is necessary to protect coastal fishing communities.

Figure no. 3. The extent to which fishing in coastal lakes may be considered a priority depending on the scale at which the organization operates



Source: Own processing

Agriculture, which covers about 40% of the European Union's land area, is considered to be the main driver of environmental degradation. It is well known that agriculture and animal husbandry, represented by cattle, pigs, sheep, poultry, have an important contribution to the economic growth of the area and serve as a driving force for the sustainable economic development of the Romanian coastal area.

For the coherence of maritime spatial planning, it is necessary to collect data from users or terrestrial activities in the coastal zone because both agriculture and biodiversity conservation are necessary for human existence and well-being (Lécuyer *et al*, 2021, p.7).

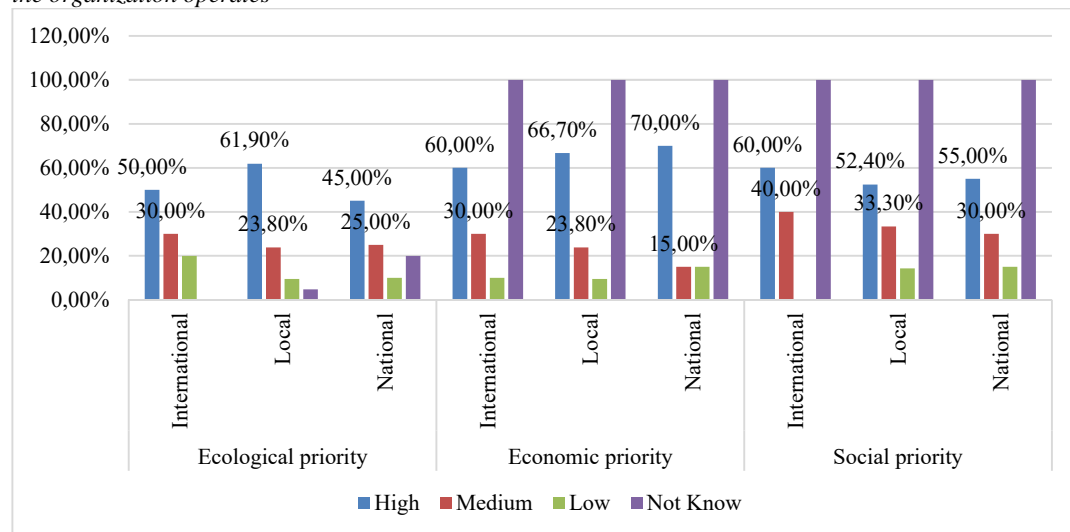
According to the analysis based on the questionnaire, regardless of the scale of the organization, agriculture and animal husbandry are considered a high *ecological priority* for 52.9% of the analyzed entities, 25.5% consider it an average priority, 11.8% low and 9.8% do not know. These results reflect the fact that stakeholders are aware of and accept the value of agriculture and its role in protecting biodiversity namely, to produce cleaner food in full correlation with the conservation and development of the environment.

Regarding the appreciation of the *economic priority*, 66.7% of the stakeholders consider agriculture and animal husbandry as high, 21.6% average, and 11.7% do not know. As it can be seen, the perception of stakeholders is eloquent, agriculture being considered extremely important for the development of the area.

Regarding the *social priority*, it is considered high by 54.9% of the entities, an average of 33.3% and 11.8% do not know. A large part of the population in rural areas is engaged in agricultural activities, the employed labor force ensuring its existence mainly in this way. Thus, this aspect of the living standard of the inhabitants of the area has a strong characteristic of social vulnerability.

Therefore, stakeholders' perceptions of agricultural activity are needed in the analysis of coastal conflicts, as it has a substantial potential for sustainable growth.

Figure no. 4. The extent to which agriculture can be considered a priority depending on the scale at which the organization operates



Source: Own processing

The European MSP Directive has decided to give greater importance to land-sea interactions (LSI), in particular for the development of the National Maritime Space Plan and the development of rational, sustainable development scenarios for maritime activities in harmony with the marine environment; scenarios are relevant in maritime spatial planning (MSP) because they provide an inclusive and comprehensive approach, reaching all sectors that interact directly and indirectly in a given area (Calado *et al*, 2021, p.2). Therefore, the identification of important issues in the areas of fisheries and agriculture is necessary for the coherence between terrestrial and marine planning, avoiding conflicts, and establishing synergies between activities.

## 5. Conclusions

The European MSP Directive requires that land-sea interactions (LSI) should be taken into account to promote sustainable, integrated development and to manage human activities at sea. It is well known that maritime spatial planning (MSP) is one of the many framework conditions that shape

development activities on land or at sea.

Land-sea interaction (LSI) is a complex phenomenon that involves both natural processes along with the land-sea interface and the measurement of the socio-economic impact of human activities taking place in the coastal zone. LSI is defined as „interactions in which terrestrial natural phenomena or human activities have an impact on the marine environment, resources and activities and interactions in which marine natural phenomena or human activities have an impact on the terrestrial environment, resources and activities” (SUPREME, 2018, p.11).

This research is part of the concerns of Romania and Bulgaria to support coherent activities on maritime spatial planning and the establishment of a long-term mechanism for cross-border cooperation in the Black Sea basin with MSP. Within the MARSPLAN-BS-II project, the research team started a whole series of studies, as well as this paper, through which useful information was collected from stakeholders, public and private authorities, whose activities are directly or indirectly related to this space to establish a common strategy.

Identifying land-sea interaction in the coastal zone provides opportunities for the development of fishing and aquaculture activities in both marine and freshwater areas, as well as for agriculture and animal husbandry activities and avoiding potential conflict with current maritime and coastal activities.

## 6. Acknowledgment

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