



## MSP for port areas – To what extent should we interfere with governance of ports' waters? Case study of Polish seaports

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### ABSTRACT

The EU MSP Directive imposed the requirement to develop plans for all water areas under the jurisdiction of an EU country by the end of March 2021. Poland is the only country in the Baltic Sea Region whose maritime administration has decided to elaborate detailed maritime spatial plans for port waters. The aim of the paper is to draw conclusions from the work carried out so far on the MSP for Polish port water areas. For this purpose, the drafts of the first ever plans for port areas, constituting Poland's internal marine waters, were considered. The authors analysed planning efforts concerning Polish port water areas in two stages, quantitative and qualitative. The subjects of the analysis were the draft spatial maritime plans, prepared or in preparation, for three selected ports – Gdańsk, Szczecin and Elbląg. These study cases were chosen to represent the best variety of approaches (they were elaborated by different planning companies, having very different planning backgrounds) and were the basis for evaluating the solutions proposed in the draft plans in terms of possible interpretations of the plan's provisions. The paper raises such questions as: What kind of functions (uses) occur while elaborating the maritime spatial plan of the port's waters?; How are the functions distinguished within the ports' plans interpreted by planners originating from different environments and having different types of planning experience?; How could the process of maritime spatial planning for port waters be coordinated between port authorities, maritime administration, and municipal authorities?

### 1. Introduction

Spatial management of the marine environment is effective when it provides 'a mechanism for consensus' in a given area [1]. The role of such a mechanism is usually fulfilled by Maritime Spatial Planning (MSP). One of the basic tools for developing and improving comprehensive marine spatial plans while also advancing ecosystem-based management and engaging communities of stakeholders is marine zoning [2–4]. Zoning, although not sufficient without a comprehensive and adaptive marine spatial management plan ensuring that planning precedes zoning [4], p.1, facilitates decisions for existing and future uses and activities in the marine space [5].

Within the process of MSP, the sea areas are divided into water areas

of a specific use (use zones, functional zones), designated for one or several compatible types of human activities, corresponding with the area's physical features and the current usage and socioeconomic development needs [4,6]. Dividing the sea areas into different use zones helps to achieve numerous objectives for allocating rights and responsibilities in marine and coastal areas [7] and provides the technical basis for marine development, management, and conservation [8]. Administration efficiencies, user certainty, as well as a more secure and predictable investment climate for industry are also mentioned as benefits of marine zoning [3,5,9,10].

The process of zoning involves determining locations for particular objectives and activities, and delimiting the areas where they occur [11]. Fang [12] defines the marine functional zone as the area with the

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'best use' designated in view of the natural resources, environmental conditions, geographical location, state of development and use of the sea area, and national and regional demands for sustainable development.

While preparing maritime spatial plans, each country creates its own catalogues of functions, and defines and structures them differently. For instance, among the marine uses and activities in the 'Marine Plan Partnership' for the area of British Columbia in Canada [5], p. 5, the following categories are listed: *aquaculture, energy, industry, infrastructure, recreation and tourism, research, utilities*. Port activities have not been listed as a separate category in this case, but are included in the *infrastructure* category, where they fit into the (1) *commercial and recreational anchorages* and (2) *docks, wharfs & facilities* sub-categories [5], p. 6. In the case of the classification of functions in the third generation of the Chinese MSP [8], the *port and navigation* category are treated separately and listed next to such categories as *mariculture and fishery, industry and urban use, minerals and energy, tourism and entertainment, marine protection, special purpose, and reservation zone*.

In the case of such European plans as the Netherlands' Maritime Spatial Plan [13], Germany's Maritime Spatial Plan from 2021 [14], and the Marine Spatial Plan 2020–2026 of Belgium [15], an integrated, adaptive and multiple-use approach has been taken [4], p. 4. The German plan covers the German Exclusive Economic Zone (EEZ) of the North Sea and the Baltic Sea, as the territorial sea areas are under the jurisdiction of the coastal federal states, which elaborate their own maritime plans (currently, only the states of Lower Saxony, Schleswig-Holstein and Mecklenburg-Vorpommern have their marine plans). The Dutch and German plans define use zones only where necessary [13,14], while the Belgian plan divides all the national waters of the North Sea into use zones [15]. The Netherlands' Maritime Spatial Plan does not designate sea areas for port use or development [16]. Germany's Maritime Spatial Plan [14] also does not list port activities and development, as these uses are located on territorial sea areas, being the subject of the State planning. The Marine Spatial Plan 2020–2026 of Belgium [17] defines such zones as: (1) *research on fishing techniques* (2) *nature conservation* (3) *energy cables and pipelines* (4) *shipping* (5) *dredging deposits* (6) *port development* (7) *sea fishing and aquaculture* (8) *sand and gravel extraction* (9) *coastal defence* (10) *military use* (11) *munition deposits* (12) *scientific research* (13) *recreation activities* (14) *measuring posts and masts* (15) *cultural heritage* (17) *commercial and industrial zones*. Therefore, from all the three mentioned European plans, only the Belgian one provides the *port development* zone as the area of potential expansion of ports (Ostend and Zeebrugge). Still, the plan does not refer to the port waters themselves.

The differences in the categories used by different countries are the result of various local conditions (including national priorities), but they might also be a consequence of scales of elaboration as, along with the development of the MSP and recognition of existing challenges, the planning scales become more detailed [2,8,18,19]. Although differently categorised and named, zones designated for port activities and development are delimited in the maritime spatial plans of many countries. Zones covering port waters are, however, usually only a part of a larger maritime spatial plan, and are not a subject of a separate detailed plan. In most cases, planning at such a scale takes place at the level of the port strategy or port master plan. Poland is the only country in the Baltic Sea Region whose maritime administration has decided to elaborate separate detailed maritime spatial plans for port waters.

This study describes and tries to evaluate the process of drafting detailed scale maritime spatial plans for the waters administered by the port authorities. Before drafting the high-resolution plans of ports' waters, the Maritime Spatial Plan for Polish Sea Areas on the scale of 1:200,000 was elaborated. The reason for elaborating more detailed ports' plans was that the 'large' plan was not precise enough to be used for port management or to be fully integrated within the planning of land areas. The body responsible for elaboration of both the ports' plans and the Plan for Polish Sea Areas is the Polish Maritime Administration.

However, the development of these plans has been commissioned to various planning teams, representing backgrounds with previous experience in maritime spatial planning or planning on land areas. The work describes the process of planning the port waters using the example of three Polish ports. The paper raises the following questions: (1) What kind of functions (uses) occur while elaborating the plan of ports' waters?; (2) How are the functions distinguished within the ports' plans interpreted by authors originating from different planning environments?; and (3) How could the process of maritime spatial planning for port waters be coordinated in the areas where the competences of port authorities, maritime administration and municipal authorities meet?

The paper consists of three basic parts: (1) description of the process of planning the Polish ports' water areas as part of the MSP in Poland; (2) quantitative and qualitative analysis of the functions indicated in the draft plans for each port's water areas; and (3) discussion of the key problems and conflicts that arose during the process of planning the ports' waters.

The authors decided to use the case study method. The basic criterion for choosing the three study cases (Elbląg, Gdańsk, Szczecin) of the 14 for which the MSP for the port's waters is currently under elaboration in Poland (Fig. 1) was most of all considering the highest possible diversity of plans in terms of: (1) variety of approaches represented by the planning teams, coming from different professional backgrounds, still however working within the same legal framework; (2) differences in physiographic, infrastructural, management, economic and functional conditions.

The Port of Elbląg is a municipal port. It plays a marginal role in Poland's international trade but has regional importance in reloading about 130,000 tonnes per year (Fig. 1). Currently, it is also the subject of a very large infrastructure investment – the channel across the Vistula Spit. The new channel connects this river port across the Vistula Lagoon with the open sea without the need to pass through foreign sea waters. The draft marine plan of the port of Elbląg was created by a team embedded in maritime research, experienced previously in elaboration of the MSP for Poland, the so-called 'large plan'. The other two examples – Gdańsk and Szczecin – are state-owned ports of primary importance for the Polish economy. The Port of Gdańsk is situated in the mouth of the Vistula River (the older part of the port) and in the Bay of Gdańsk (the deep-water part of the port). Gdańsk is Poland's largest seaport, with a turnover of over 53 million tons per annum [20], which is almost half of the total port turnover in the country (Fig. 1). The Port of Szczecin, situated on the Oder River, is both a sea and an inland port. It connects to the sea by an over 60-km-long canal going through the waters of the Oder River, Szczecin Lagoon, and the Świna River. The port is equipped with many general use terminals, while the new deep-water terminals are located in the port of Świnoujście, being formally connected with the port of Szczecin as a complex. For the purposes of this study, only the port of Szczecin is taken into consideration from the Szczecin-Świnoujście port complex. The plans for the Gdańsk and Szczecin port waters were prepared by the urban planning offices, experienced in planning on land.

The analysis of the three detailed plans of the Elbląg, Gdańsk and Szczecin ports' waters were based on the plans' detailed provisions. The authors of these plans were required to use the catalogue of 11 functions specified in the regulation defining the legal framework for MSP in Poland. However, the regulation does foresee the possibility of adding new functions where needed.

## 2. Planning of Polish ports' water areas as a part of MSP

The spatial planning of marine areas in Poland is regulated in the Act of 21 March 1991 *on Maritime Areas of the Republic of Poland and Maritime Administration*, which, with further amendments, implements the Polish legislation. Poland introduced Maritime Spatial Planning (MSP) into its legal system in 2003, as one of the first countries in the world [23]. However, the official planning process started in Poland in 2013.

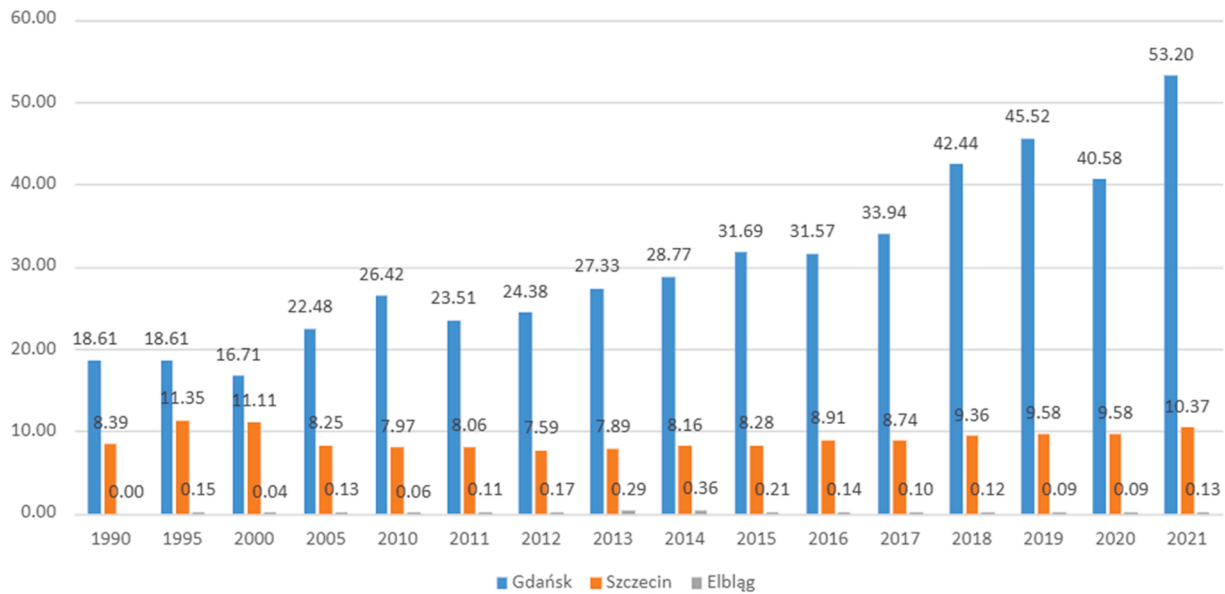


Fig. 1. Cargo turnover in the 3 chosen Polish sea ports (Gdańsk, Szczecin, Elbląg) in 1990–2021 [million tonnes]. Source: [21,22].

In the first stage, the *Study of conditions for spatial development of Polish maritime areas* was prepared (2014–2015) [24].

The EU MSP Directive (*Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning* [25]) imposed the requirement to develop plans for all areas under the jurisdiction of an EU country by the end of March 2021 and set out key requirements (such as using an ecosystem approach, ensuring public participation in the process, applying the best available knowledge, and ensuring consistency between plans, among

others). An EC report published in 2022 [26] examining the implementation of the above-mentioned directive shows that, thanks to this framework, for the first time, all coastal Member States simultaneously developed national maritime spatial plans, ensuring cross-border cooperation. By February 2022, the majority of the 22 EU coastal states had adopted spatial plans for their marine areas (five countries are significantly behind schedule, and two are in the final stages of adoption). According to the assessment [26], the adopted maritime plans are characterised by functional convergence, inter alia in terms of the

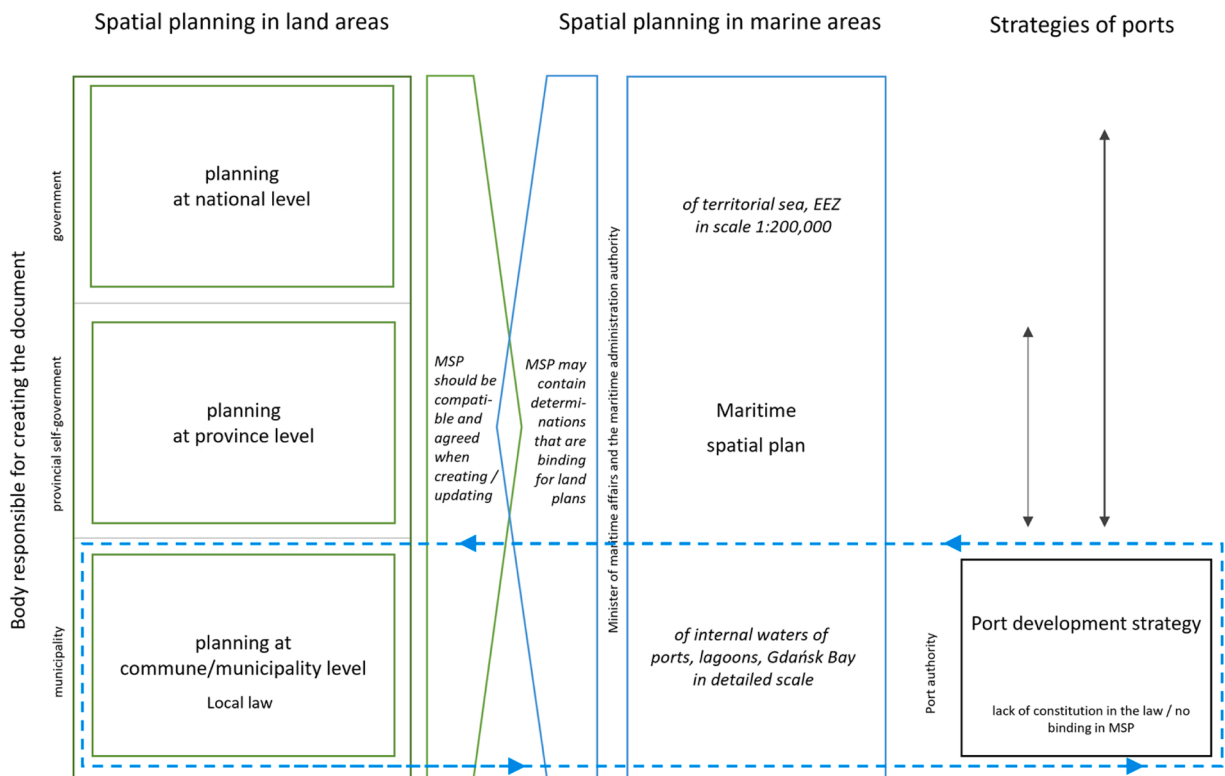


Fig. 2. Scheme of Polish spatial planning system and the relations between maritime spatial planning, land planning and strategies of port areas. Source: Own elaboration.

zoning approach. This means that the EU maritime spatial plans generally identify where activities are allowed and where they are not, setting out the relevant water areas for those activities (use zones).

In the years 2016–2019, the work was carried out on the *Maritime Spatial Plan for Polish Sea Areas* on a scale of 1:200,000 [27], often called the ‘large plan’. This plan was adopted in Poland as a regulation of the Council of Ministers in 2021, covering parts of internal marine waters, the whole territorial sea area, and the exclusive economic zone [28]. It serves as a tool for coordinating activities in the water space, a reliable source of spatial conditions and a tool for assessing applications submitted in the proceedings to determine the compliance of planned projects with the arrangements of the plan and decisions for public entities and users of the marine areas [29]. In some areas, however, due to the intensity and density of local conflicts, the scale of the Maritime Spatial Plan for Polish Sea Areas (1:200,000) is not precise enough. Therefore, the next step in the process of shaping the Polish MSP system was to elaborate more detailed plans covering the most intensively used water areas, including ports.

Seaports are an important part of the national economy. As they are located within the area of a commune, their terrestrial areas are covered by the local development plans drafted by city authorities (Fig. 2). The port’s interests, development plans, demands for space, and the need to ensure their strategic safety are considered in the planning process of their land areas, led by municipalities. Planning the water areas of ports is the area of competence of the Polish maritime administration, and a subject of MSP. At the same time, Polish seaport authorities prepare their own development strategies, being an internal document of the port enterprise. These strategies, indicating the most important investments for future port development (for example, connected with the enlargement of a turning basin, or deepening of the port’s channel), sometimes also cover water areas. Although the strategies usually refer

to planning and strategic documents at the national, regional, and municipal levels, they have no legal basis in the Polish planning system (Fig. 2). Until maritime spatial plans of ports were introduced, the water areas of Polish ports were not a subject to formal spatial planning.

Currently, Poland is the only country in the Baltic Sea Region whose maritime administration has decided to include all seaports in its marine plans. This decision is justified mostly by the need to cover all sea waters, including internal sea waters, which are port waters or lagoons. As a result, detail plans of port waters, on a scale of 1:5000 or 1:10000, are being created. Simultaneously, they are methodologically coherent with a plan developed for all Polish waters on the scale of 1:200000.

Poland has four ports of basic importance to the national economy (Gdańsk, Gdynia, Świnoujście and Szczecin) and 28 other ports and harbours of regional or local impact (Fig. 3.). The Polish maritime administration decided to elaborate detailed plans for all ports of basic importance for the national economy and 13 small ports. The decision to develop detailed plans for the ports of Gdańsk, Gdynia, Świnoujście, Władysławowo and Hel (Fig. 3) was made, even though their external water areas (located outside the system of breakwaters) were already included in the *Maritime Spatial Plan for Polish Sea Areas* from 2021. The detailed plans of these five ports are supposed to cover both the external and internal waters situated within the ports’ administrative borders defined in regulations. After the adoption of these detailed plans, the area of external port waters will be automatically excluded from the boundaries of the large plan (MSP for Polish Sea Areas). The remaining Polish harbours are considered in the three detailed plans for the internal sea waters of the Vistula Lagoon, Kamień Lagoon and Szczecin Lagoon.

The development of the detailed plans for the ports’ water areas is progressing in 12 stages, which now are slightly different for each plan, although almost all are at the final stage. The stages are defined as:

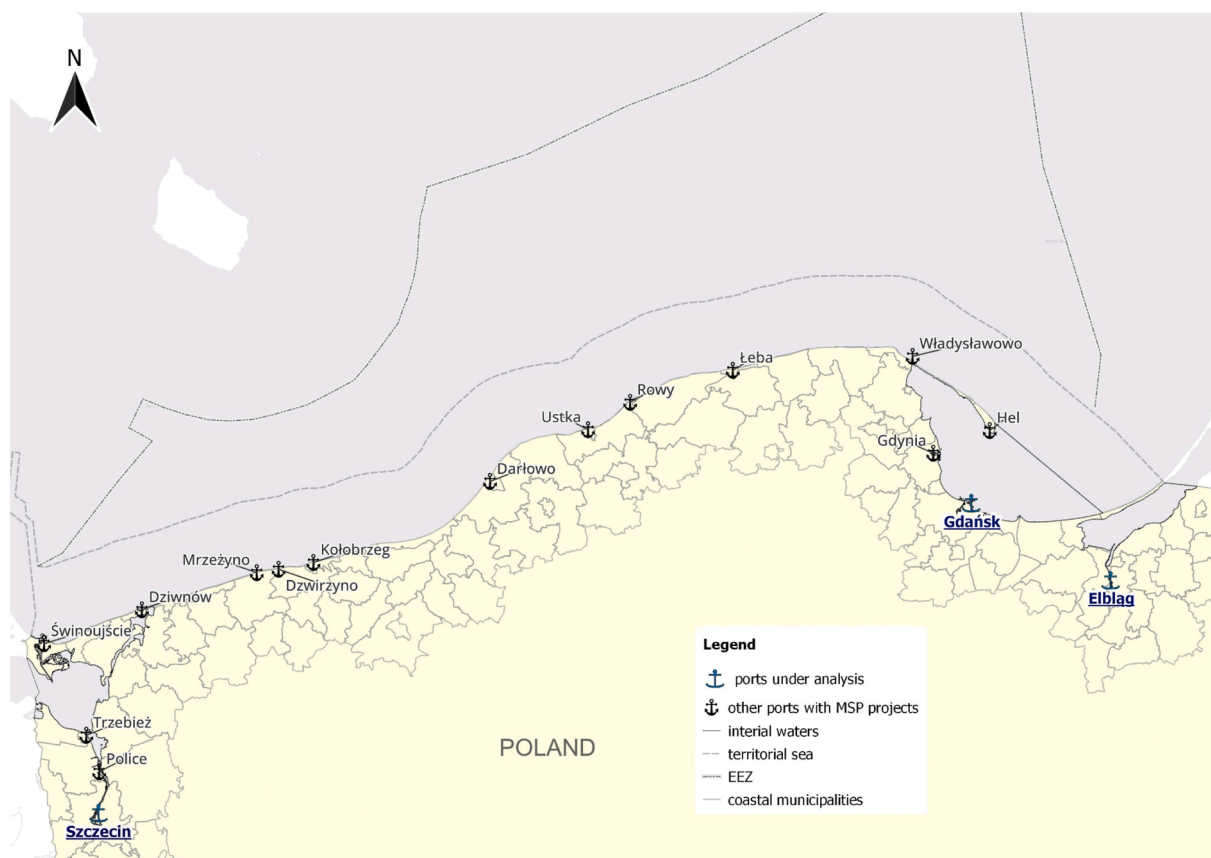


Fig. 3. Polish seaports undergoing the process of preparation of marine spatial plans.

Source: Authors’ own work based on [www.sipam.gov.pl](http://www.sipam.gov.pl) [31].

Announcement on accession to the preparation of the plan (I), Collection of applications and preparation of a draft plan (II), Plan conditions and version V\_0 (III), Version V\_1 of the plan (IV), Agreements and opinions (V), Acceptance of agreements or submission of comments (VI), Version V\_2 of the plan (VII), Agreements and opinions (VIII), Transmission to the responsible entity (ministry) (IX), Transboundary agreements (X), Legislative assessment of the draft legal act (XI), Adoption of the plan (XII) (Table 1).

In each of the plans currently being elaborated for port waters, the planning area was divided into water areas of a specific use (use zones) called, in this case, 'basins'. The detailed provisions defined separately for each of the basins were elaborated in the form of the so-called 'basin card' – a form whose structure and content was precisely defined in the Regulation [30]. Following the provisions of the Regulation, it is possible to assign only one primary function and several permissible functions per single basin. The Regulation foresees 11 basic categories of functions, including: (1) artificial islands and structures, (2) transport, (3) technical infrastructure, (4) environmental and nature protection, (5) cultural heritage, (6) fishing, (7) aquaculture, (8) obtaining renewable energy, (9) prospecting for, recognition of mineral deposits and extracting minerals from deposits, (10) tourism, sport and recreation, and (11) state defence and security. Thus, at the level of the planning process, the choice of the main function and permissible functions of a single basin is made. The criteria used to delimit these basins and define their functions are agreed upon on a case-by-case basis by the planner with the area managers and stakeholders. Thus, delimiting particular basins and their use was defined by planners in the process of public consultations. An important assumption of this planning process is that if a function is not defined for a particular basin as either primary or permissible, it is not allowed in this area, with all the consequences and restrictions that this implies. Another common feature of all the analysed plans is the freedom to determine the number of permissible functions in each of the basins as well as their scope (including the possibility of adding new functions not listed in the catalogue given in Regulation [30]).

The planning of port areas in Poland is therefore unique in Europe and not found in other EU Member States, as it also covers inland marine waters managed by the Polish Maritime Administration. Another difference lies in the scale of the ports' plans, which are far more detailed for Poland than for the other EU countries. The most important feature (and challenge) of the Polish approach, is the need to look for solutions at the interface between planning competences: maritime

administration (having planning powers in sea waters), port management (managing the entire port area and creating port development strategies) and port city authorities (having planning powers on land).

### 3. Primary functions indicated in draft plans for port water areas

The port area under maritime spatial planning in Gdańsk covers an area of 137.33 km<sup>2</sup> and in Szczecin 7.21 km<sup>2</sup>. Of the analysed maritime plans, the draft plan for Elbląg is the smallest in terms of the area (less than 1 km<sup>2</sup>). Within the analysed maritime spatial plans of port waters, the largest number of basins – 39 – were delimited in the draft plan for Gdańsk, while for Szczecin it is 24 and for Elbląg 26. However, the plan of the Elbląg port seems to be very complex, being characterised by the highest number of basins per square kilometre, with as many as 26 basins per less than one square kilometre (Table 1).

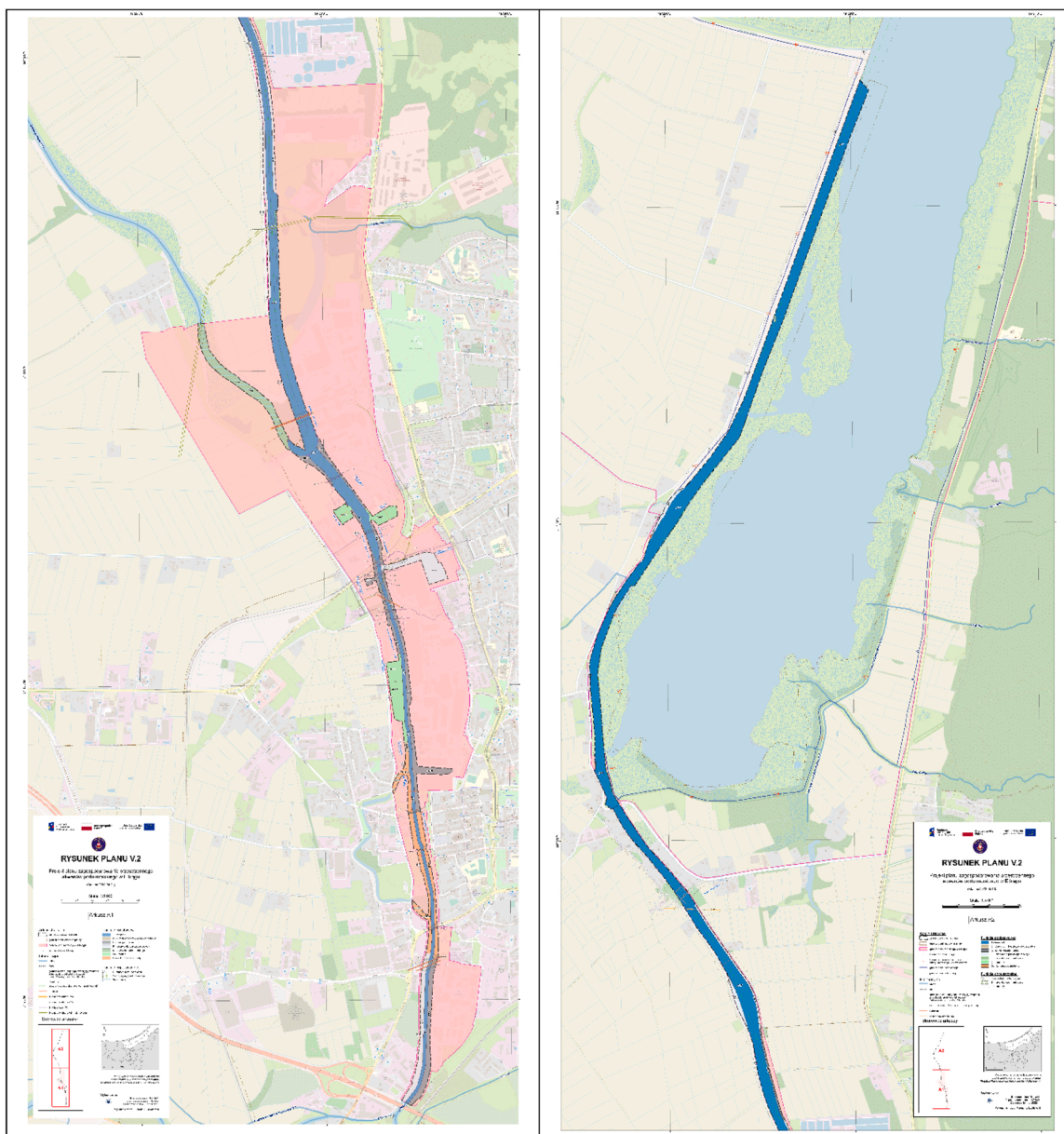
The Port of Elbląg is located close to the old town, on the river, being a transport axis, which serves not only the port but also the tourist navigation taking place on the Elbląg Canal between the towns of Elbląg and Ostróda (Fig. 4). The level of advancement of the draft maritime plan for the port of Elbląg is currently IX (transmission to the responsible entity). At this almost final phase, changes to the plan are not expected anymore. In Elbląg, the primary *port* function has been determined in nine of 26 designated basins. The area covered by the *port* function is about 0.089 km<sup>2</sup>, which is about 9.4% of the total area of the plan. In the remaining water bodies, having other primary functions, the *port* function does not appear even once as a permissible one. However, in the general provisions, it is indicated that 'the main purpose of the area covered by the plan is to maintain safe access to the seaport of Elbląg and ensure its functioning', which can be understood as the primacy of this function in the draft plan. *Transport* was determined as the primary function in the plan for Elbląg only twice, but the area of these two basins amounts to 0.638 km<sup>2</sup>, which constitutes over 67% of the entire area covered by the plan. *Transport* as a permissible function was included in 14 basins.

The Port of Gdańsk consists of the inner part (the old part of the port is located along the Vistula and Motława rivers, almost in the city centre) and the outer part on the waters of the Gdańsk Bay, along with the port's fairways, turntables, and anchorages (Fig. 5.). The level of advancement of the draft maritime plan for the port of Gdańsk is IX (transmission to the responsible entity). The *port* function in Gdańsk is indicated as dominant in 13 of the total of 39 basins. A large area occupied by the *port*








**Table 1**  
Characteristics of the analysed draft maritime spatial plans of Elbląg, Gdańsk, Szczecin seaports regarding primary functions.

No.	Name of the primary function and its symbol on the plan	Number of basins with a given primary function in the port's plans [-]			Surface area of a basin designated to a given primary function [km <sup>2</sup> ]			Share of the surface area of a basin designated to a given primary function in the total area of the port plan [%]		
		Elbląg	Gdańsk	Szczecin	Elbląg	Gdańsk	Szczecin	Elbląg	Gdańsk	Szczecin
1.	Port activities (Ip)	9	13	9	0.089	41.74	4.142	9.37	30.39	57.42
2.	Research (N)	0	0	0	0	0	0	0.00	0.00	0.00
3.	Cultural heritage (D)	2	0	0	0.046	0	0	4.84	0.00	0.00
4.	Technical infrastructure (I)	0	0	0	0	0	0	0.00	0.00	0.00
5.	Environmental protection (O)	0	2	0	0	0.58	0	0.00	0.43	0.00
6.	Exploration, recognition and extraction of minerals from seabed deposits (K)	0	0	0	0	0	0	0.00	0.00	0.00
7.	Artificial islands and constructions (W)	0	0	1	0	0	0.021	0.00	0.00	0.29
8.	Transport (T)	2	6	12	0.638	12.07	2.885	67.09	8.79	40.00
9.	Tourism, sport and recreation (S)	1	0	2	0.039	0	0.165	4.10	0.00	2.29
10.	Reserved for future development	7	0	0	0.092	0	0	9.67	0.00	0.00
11.	National defence and security (B)	1	0	0	0.001	0	0	0.11	0.00	0.00
12.	Marinas (Sm)	4	9	0	0.046	0.73	0	4.84	0.53	0.00
13.	Shipbuilding industry (Ps)	0	4	0	0	0.94	0	0.00	0.68	0.00
14.	Seashore protection	0	1	0	0	1.02	0	0.00	0.74	0.00
15.	Local transport (Tk)	0	4	0	0	80.25	0	0.00	58.44	0.00
	Total	26	39	24	0.951	137.33	7.213	100	100	100

Source: Authors' own work based on data from [32,34,35].



**Primary functions of basins**

- |   |                                |   |                                     |
|---|--------------------------------|---|-------------------------------------|
|  | T – transport                  |  | P – reserved for future development |
|  | B – defence and state security |  | S – tourism, sport and recreation   |
|  | Ip – operation of the port     |  | Sm – marinas                        |
|  | Ds – cultural waterfronts      |   |                                     |

**Fig. 4.** Draft plan of port waters for the port of Elbląg. Version 2 (V.2). Left – southern part of the plan. Right – northern part of the plan. Source: Draft plan of spatial development of water areas of the seaport in Elbląg. Version 2 [32].

function is also reserved for the development of an external port [33]. The *port* function as the primary one occupies an area of 41.74 km<sup>2</sup>, which accounts for 30.4% of the total area covered by the plan. As a permissible function, the *port* function occurs in a total of 13 basins. Interestingly, the port anchorages were not included in the area occupied by the *port* function but were classified as a *local transport* function due to the need to allow smaller vessels, including fishing and tourist vessels, to navigate on these waters. *Transport* is the main function in Gdańsk for six basins with a total area of 12.07 km<sup>2</sup> (which constitutes

8.8% of the area of the draft plan). It is also a permissible function for two other basins. The *transport* function only covers areas separated for navigation, i.e., approach fairways to the port and channels inside the port. The remaining areas where navigation is possible are described by the *local transport* function. In the draft plan of Gdańsk port, four basins, covering an area of 79.63 km<sup>2</sup>, have been identified as areas with a dominant *local transport* function. In only one case, *local transport* was assigned as the primary function even though the area is used as a fairway, which was due to the lack of legal regulations in this respect at

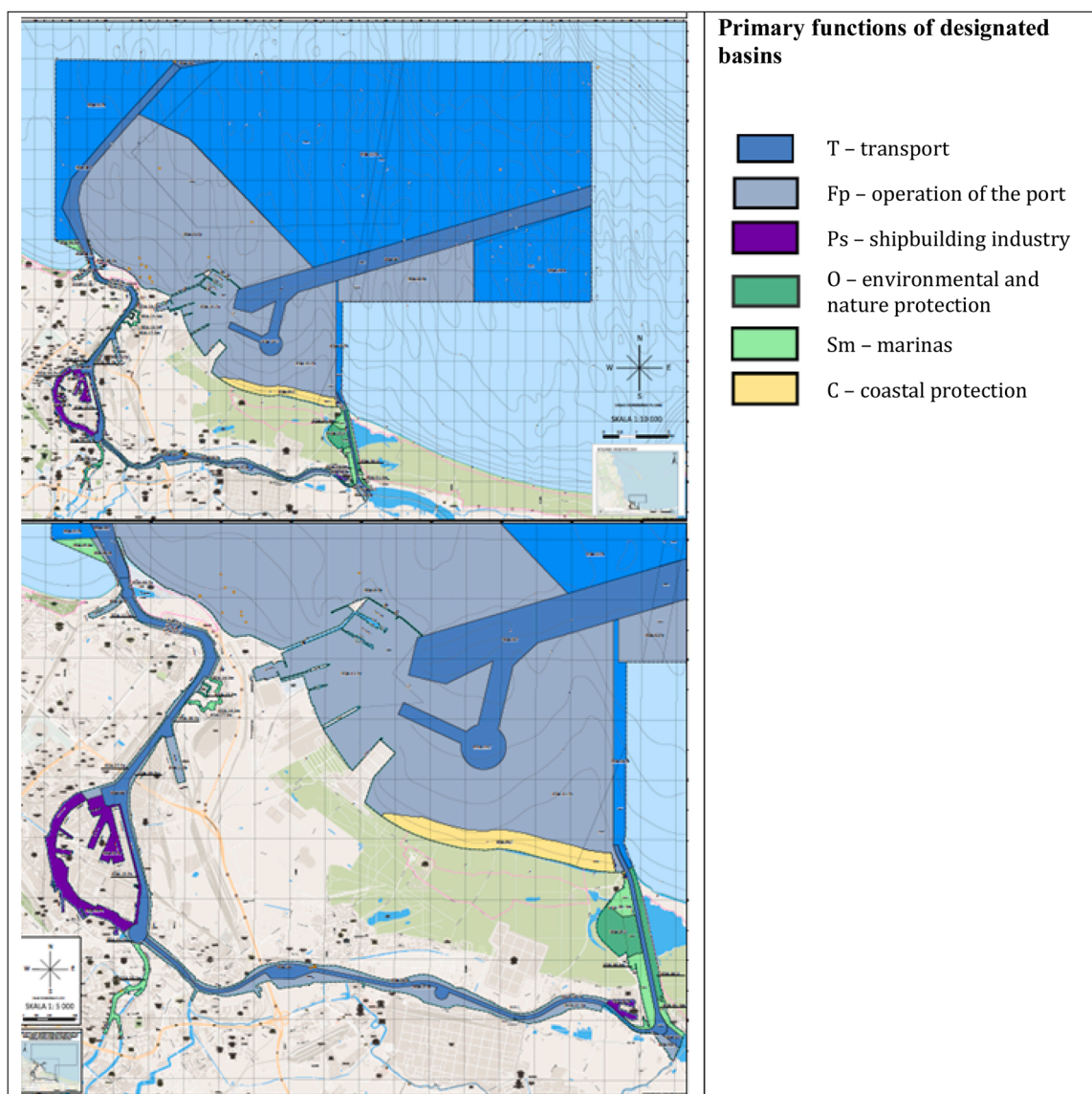


Fig. 5. Draft of maritime spatial plan for the port of Gdańsk version 2 (V.2). Above: plan of all waters of Gdańsk port on a scale of 1:10,000. Below: the part of the plan for the most intensively used areas of the port on a scale of 1:5000.

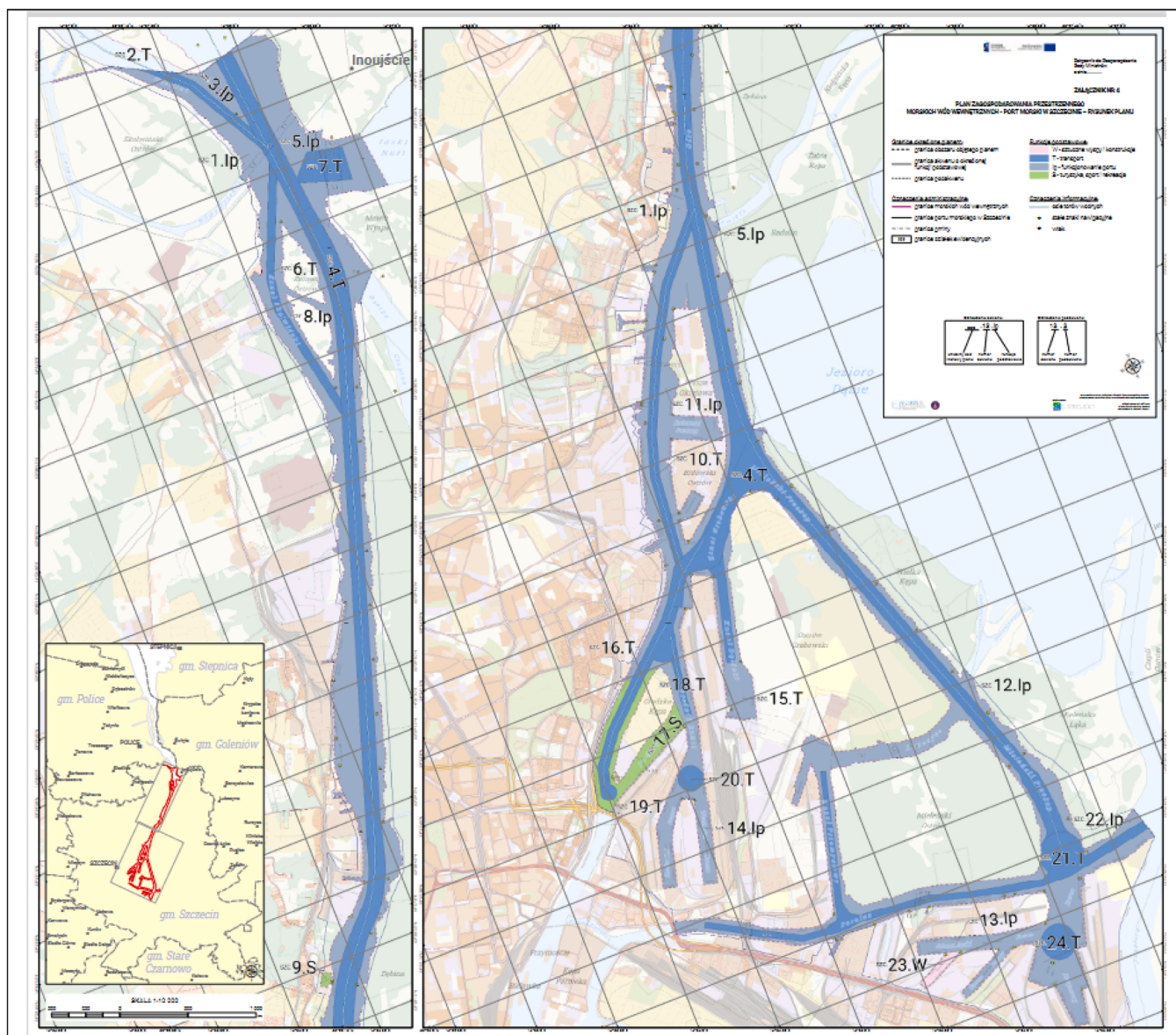
Source: Draft spatial development plan for the water areas of the seaport in Gdańsk. Version 2 [34].

the time the plan was drawn up.

The port of Szczecin, situated in the heart of the city and being a river port (spread along the Odra River), is a complex mosaic of channels and port basins (Fig. 6). The level of advancement of the draft maritime plan for the port of Szczecin is XI (legislative assessment of the draft legal act). The primary function involving *port activities* for the Szczecin port occurs in nine of the 24 designated basins and covers 4.142 km<sup>2</sup>, which constitutes 57.4% of the total area of the port subject to planning. In the remaining 15 basins, however, the *port* function is only allowed twice, and this is in both cases in basins where *tourism*, or *sport and recreation* is defined as the primary function. Their total area constitutes only 2.3% of all areas of the Szczecin harbour, which means that 40.3% of the total area of the Szczecin port is not assigned to *port* functions as the primary or a permissible function. *Transport* is the most accepted primary function in Szczecin harbour, allocated to as many as 12 basins, accounting for 40% of the plan area. It is primarily covered by shipping lanes, delineated into port channels and turning basins. Interestingly, its acceptance as the primary function for a given basin is followed by the exclusion of the functions *scientific research and exploration*, *prospecting*, and *extraction of minerals from deposits*. The *transport* function is also

accepted as permissible in areas where the main function is *functioning of the port* or *tourism, sport, and recreation*. *Local transport* is not foreseen in the plan for Szczecin at all, while transport-related activities are covered by the *transport* function.

The *port activity* function is dominant in Szczecin (almost 60%), whereas in Elbląg and Gdańsk, the *transport* function covers almost 70% of the water areas. Comparison of the three maritime spatial plans shows that the primary function occurring only in the Szczecin port is *constructions of artificial islands*, while unique primary functions for Gdańsk are *local transport*, *shipbuilding*, *marinas*, *nature protection* and *seashore protection*. The greatest diversity of functions is observed in the plan of the Elbląg port, which indicates such primary functions as *cultural waterfronts*, *defence and state security* and *future development*. The *port* and *transport* functions and other industrial functions (such as *shipbuilding* and *reserved for future development*) constitute almost 90% of the port water area in the draft plans of Gdańsk and Szczecin, and in Elbląg, less than 90% (Fig. 7, Fig. 8.). In the plan of the Gdańsk port, the *infrastructure* and *artificial islands and structures* functions are present in all basins as permissible. The *scientific research* function is not enumerated in the areas of particular basins in the Gdańsk port as a permissible



**Primary functions of basins**

- T – transport
- W – artificial islands and constructions
- Ip – operation of the port
- S – tourism, sport and recreation

Fig. 6. Draft maritime spatial plan of the port of Szczecin version 2 (V\_2).  
 Source: Draft plan of spatial development of water areas of the seaport Szczecin. Version 2 [21].

function, but it is allowed thanks to information about it being included in the ‘General arrangements’ part of the maritime plan.

To sum up, as was to be expected, the dominant primary function for almost all ports, considering the number and area of delimitations, is *port activities*. Curiously enough, there are also functions within the ports’ water areas that seem to not be connected directly with the port activities, such as *tourism, sport and recreation, floating houses, and cultural heritage*. This could be explained by the fact that the more detailed the scale of the plan, the larger the variety of functions. Another reason might be the diverse surroundings that influence the planning decisions (for example, port areas encompass the historical city centres in some cases, like in Elbląg and Gdańsk). Interestingly, for many basins with a

basic function other than port activity, the possibility of carrying out port operations is not mentioned as a permissible function.

The authors of the port waters’ plans did not use all the functions available in the catalogue specified by the regulation defining the legal framework for MSP in Poland. The primary functions implemented in port waters’ plans from the catalogue are *cultural heritage, environmental and nature protection, artificial islands and structures, transport, tourism, sport and recreation, and national defence and security* (Table 1). Among the primary functions from the catalogue, *technical infrastructure, mineral exploration and extraction, fishing, aquaculture, and renewable energy* did not occur at all in any of the plans for Elbląg, Gdańsk or Szczecin. However, they appear in some basins as permissive functions.



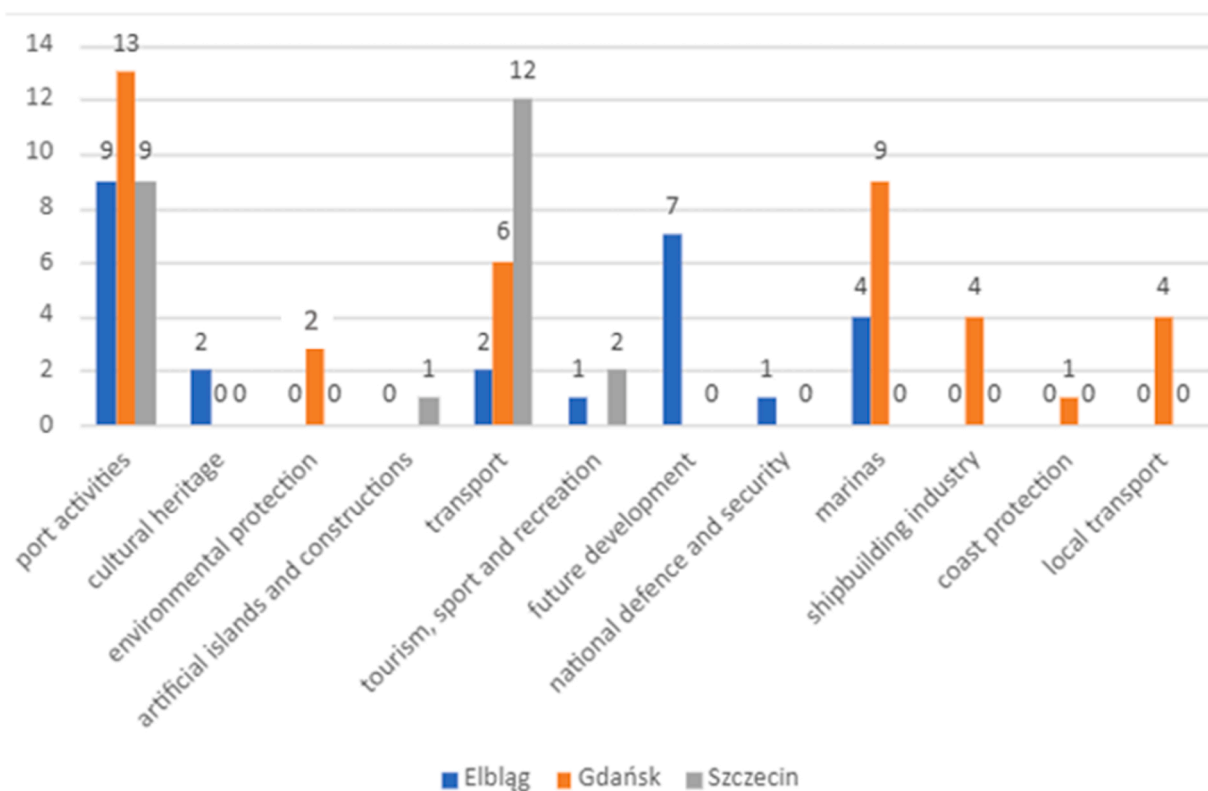


Fig. 7. Quantitative structure of basins according to their primary function in the port plans of Elbląg, Gdańsk and Szczecin. Source: Own elaboration based on data from [32,34,35].

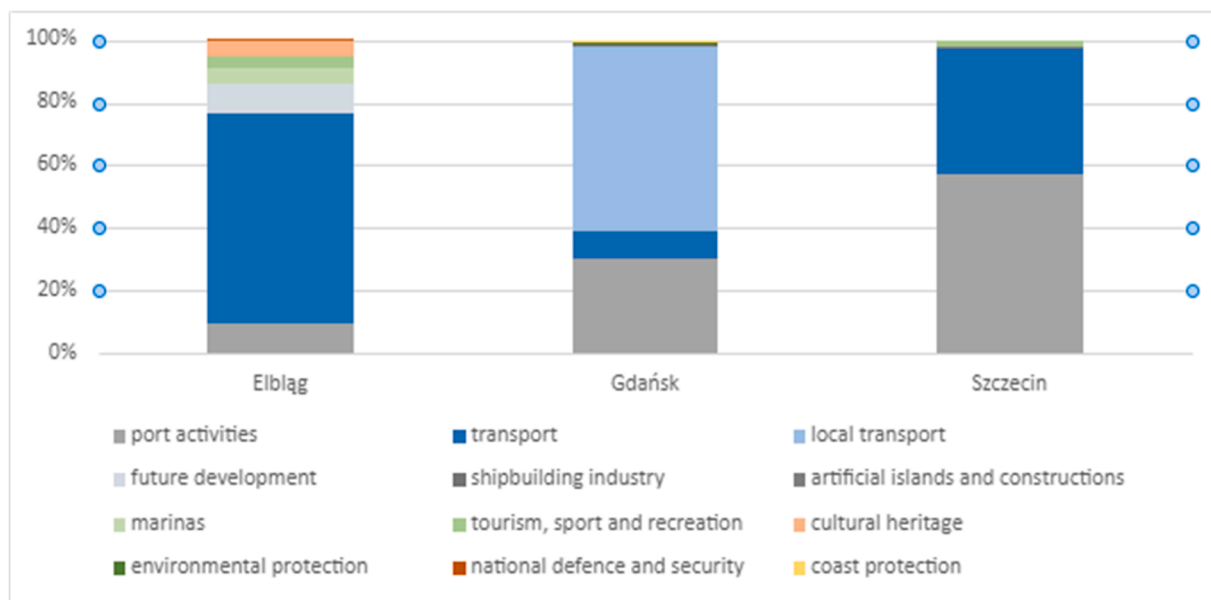


Fig. 8. Share of primary function types in port plans of Gdańsk, Szczecin and Elbląg. Source: Own elaboration based on data from [32,34,35].

Additionally, some new functions outside the catalogue were added to the list of primary functions, which more precisely define the different types of activities taking place within the port administration borders, such as reserved for future development, marinas, shipbuilding industry, seashore protection, and local transport (Table 1). As an additional permissive function, floating houses was listed in Gdańsk. Particularly important was the introduction of the function of local transport in the

plan for the port of Gdańsk next to the transport function. It was distinguished as the authors of those plans wanted to separate the areas with a purely transshipment function (port function) from the transport function (local transport).

The second most frequent primary function in the analysed draft plans is transport. Other functions that appear quite frequently in the plans as primary ones are tourism, sport, and recreation, and national

defence and security. They are specified differently for each of the ports due to their various cargo profiles, capacities (Fig. 1) and physical conditions.

#### 4. Interpretations of definitions of primary functions in maritime spatial plans of Polish ports

The analysed draft plans for the waters of the ports in Gdańsk, Szczecin and Elbląg were created almost simultaneously, as part of the MSP process led in Poland for the first time ever. Therefore, they contain some imperfections due to the lack of a complete data set, lack of previous experience with the development of such plans and some differences in understanding of the meanings of some concepts. Analysing the draft plans for Gdańsk, Szczecin and Elbląg ports, one can also notice differences in the description and definition of the primary functions themselves, which influence how the plans are read and implemented, and how the decisions on human activities in those areas might be made. Therefore, the definitions of the primary functions used in particular draft plans will be analysed further and the differences between them in the various ports will be shown.

In the maritime spatial plans for the chosen seaports, the port function is defined as follows:

- in the draft plan for the port of Szczecin: ‘means the maintenance, construction and use of port infrastructure, in particular: quays and port basins, turning basins, breakwaters, piers, jetties, slips, navigation marks, and places for the construction, repair and dismantling of vessels and other facilities associated with the operation of the port’;
- in the draft plan for the port of Gdańsk: ‘a) provision of conditions, space and infrastructure for cargo handling and passenger traffic, including passenger accommodation, b) provision of conditions and space for berthing and manoeuvring of vessels and services related to their operation, such as maintenance, replenishment of supplies, waste disposal, fuel supply, c) provision of space for existing and planned infrastructure providing access to the port and port infrastructure’;
- in the draft plan for the port of Elbląg: ‘means the realisation of tasks connected with the functioning of the port, such as trading, transshipment, service and maintenance, distribution and logistics, and other activities’.

Each of the definitions mentioned above points to the provision of space for port infrastructure. The definition used in the Szczecin draft plan is of an infrastructural character, where the elements of the port infrastructure are listed in detail. A direct indication of port activities (berthing, transshipment, services, maintenance, etc.) is not visible in this definition. The definition used for the Port of Gdańsk is the most detailed one – it indicates both the infrastructural aspects and the port activities, even listing in detail the permitted components of port operation, such as replenishment, waste disposal and bunkering. The definition used in the Elbląg plan is the most general and does not mention infrastructure or the specific use of different parts of the port in detail, but only indicates general port services. From the point of view of the port user and manager, it is preferable to use general definitions, leaving more freedom in the management of the space. The analysed projects also show differences in the approach to the location of the shipbuilding industry. In the Szczecin plan, shipbuilding, ship repair and ship dismantling are included in the definition of the *functioning of the port*, as is the case in the Elbląg plan, where it can be found in the general formulation of *service and maintenance activities*. In contrast, in the Gdańsk plan, shipbuilding was indicated as a separate priority function. In Elbląg, shipbuilding services are currently being withdrawn, and the resumption of these activities is unlikely (no applications of this nature were submitted to the plan either). The situation is different in Gdańsk, where shipyards are an important part of the city’s development, so separating this function seems justified.

Another criterion for comparative analysis is the question of the *future development* function. In the Gdańsk definition, we find an

explicit provision for ‘existing and planned infrastructure’, while in the definition of the Szczecin plan, with respect to port infrastructure, we find the term ‘construction, opening up possibilities for future investments’, while in the Elbląg plan, the definition is general enough to include ‘future port investments’. It is worth mentioning a function that only appears in the Elbląg plan – *reserve for future development* – which is defined as *not prejudged development of space as a reserve for future port development*. This indicates areas that remain undeveloped during the planning process and for which no applications were submitted. These areas are also located outside of intensive port activity, and it was difficult to prejudge what function should be developed there.

Differences in the definitions in the maritime spatial plans of the Elbląg, Gdańsk and Szczecin ports also occur with the *transport* function, which is defined as follows:

- in the draft plan for the port of Szczecin: ‘means enabling the safe passage of vessels by designating and maintaining fairways, anchorages, turning basins, ship passing places, navigation marking and other devices for the safety of navigation’;
- in the draft plan for the port of Gdańsk: ‘means ensuring sufficient space for the movement of transport units and ensuring navigational safety’;
- in the draft plan for the port of Elbląg: ‘means ensuring sufficient space for the passage of vessels for the commercial transport of goods and people and ensuring navigational safety, including the possibility of dredging and maintaining appropriate parameters of the waterway’.

Each of the definitions indicates that the essence of areas with a *transport* function is to provide space for the passage and navigational safety of vessels (the Gdańsk plan uses the less clear term ‘transport unit’). The Szczecin and Elbląg plans indicate in more detail the issues of maintaining or even improving the relevant parameters of the waterways (e.g., depth). This indication is probably due to the river character of the ports and the associated risk of siltation. Considering the types of craft that are covered by the definition of *transport*, the Elbląg plan narrows their choice to craft used for commercial transport, which automatically excludes yachts, sports boats, and other tourist boats from the definition. Allowing non-commercial vessels, therefore, requires allowing another function, in this case, *tourism, sport and recreation*. In the Gdańsk plan, the use of the undefined term ‘transport unit’ also implies a similar restriction. In Szczecin’s case, we see no such exclusion/restriction. It seems that this function applies to all units. In the Szczecin plan, the definition of the *transport* function also includes access infrastructure elements such as anchorages, navigational markings, and safety devices. These elements are missing from the Elbląg definition. No anchorages exist in this area, and the authors of this plan in principle have stated that the anchorages are covered by the function of *port activity*, and second, navigational safety equipment is included in the definition of *technical infrastructure*. In the Gdańsk plan, a new function was created to include anchorages and other elements, referred to as *local transport* and defined as (1) *providing space for the passage of vessels, the navigation route, and the fairway*, and (2) *providing space for the manoeuvring and berthing of vessels, including anchorages*. This definition is somewhat inconsistent as, on the one hand, it uses the broad term ‘watercraft’, allowing all types of craft, while on the other hand, it also includes anchorages and space for manoeuvring, where restrictions for non-commercial craft should occur.

In conclusion, it should be emphasised that the definitions of the primary functions in all the analysed ports cover all the key elements for the efficient functioning of a port. However, differences occur in the exact meanings of definitions, which can be confusing and inconsistent from the point of view of a potential user or investor, who will have to understand the logic of each of the plans separately. Moreover, they can lead to differences in the legal interpretation of a particular function.

Restrictions applied in the draft plans resulted from such factors as: the need to protect the area and maintain safety, the location of

technical infrastructure, other regulations (ex. establishing a building-free zone at a distance of 10 m from the outline of an oil pipeline), national defence needs, requirements regarding ports meeting the ISPS code, safety of users (e.g. prohibition of designating swimming sites in the vicinity of waterways, port entrances, strong currents, etc.), location of land transport infrastructure (including the route of tunnels, bridges and crossings and the minimum clearance around high-voltage lines), and port regulations.

Restrictions on activities in particular basins have been introduced related to sailing, fishing, and sport, and to the management of technical infrastructure (e.g., by introducing minimum clearance parameters for power lines, and prohibiting the introduction of mobile structures).

Sometimes, the provisions of the plans may introduce functional limitations on land, especially when it comes to sustaining the safety of navigation or safety of users. For example, in the plan of Elbląg port, there is a prohibition on creating mooring places at the site of future ship turntable. Such prohibition might have a restrictive effect on planned tourist development or sport and recreation on land. Another (of similar character) example is the prohibition on establishing swimming sites.

## 5. Discussion

The maritime administration made the assumption that all maritime areas of the Republic of Poland should be covered by maritime spatial plans. However, due to the varied intensification of activities in selected maritime areas, different scales of detail of the development of plans were adopted. Due to a lack of previous experience in maritime spatial planning (the first plan was adopted in Poland in 2021), a very cautious and flexible approach was also assumed, which would not block the possibility of use and management in situations that are currently difficult to foresee.

In the process of planning the different parts of the Polish maritime areas, the designers of the plans were permitted to individually define the functions. This approach may on the one hand make the interpretation of a given function difficult at the national level, but on the other hand also provides the opportunity to check the effectiveness of various records in practice, and in the future may constitute the basis for discussion while monitoring the execution of the plans. As the process is being undertaken for the first time, the aforementioned differences, which can create interpretive challenges, may also be the result of the administration's limited experience in working with different planning teams in different areas.

Clear differences between the plans of the ports can be seen in how the functions were defined within city centres. In the city centre of Gdańsk, which is an outstanding cultural and tourist attraction, the port water areas are defined by the *marina* function. In Elbląg, on the other hand, an equally historic but less popular tourist city, the maritime plan introduces the function of *cultural waterfronts*, providing greater integration of the water space with the waterfront. The differences in the provisions of the plans here are again mainly due to the different approaches of the various planning teams, but also to the requests made by the authorities of the individual cities. In Elbląg, the city authorities did not apply for the use and development of the port water area adjacent to the city boulevards. As a result, the idea of introducing *cultural waterfronts* came from the planners and was based on the collected planning materials. In Gdańsk, a request was made to allow the *marina* function to continue into the city centre. Perhaps this situation is a result of the proper functioning of the water space in the centre of Gdańsk, or perhaps of the lack of an integrated approach in relation to water and land space. It can be concluded that in the reality of the first maritime planning process, planning decisions often result from the experience of the planners and their approaches to the maritime areas and their surroundings. All applications submitted to each of the port's plans by stakeholders had to be listed and responded to by the planners in the form of a document published on the website of the Polish Maritime Administration. It is noted that, in some plans, the spatial designations

of the basin's functions are mainly based on the submitted applications, in others also on the knowledge gathered by planners during the process. That approach allowed elements that were not supported by the applications to also be included in the plans, although this was not needed from a formal point of view. The difference in the approach depended on the planners' experience in maritime planning and their attitudes.

Another challenge is the design of the basin cards imposed by law, which is not intuitive and may cause problems with understanding and interpreting the records. The rather 'rigidly' designed form of the basin cards, describing detailed provisions for particular basins, results in difficulties in entering a number of more detailed information connected with the specificity of the designated basin. The inflexible scope of the provisions, with the simultaneous complexity of the processes taking place in the given areas, especially in ports, result that some information cannot be placed directly on the card and is instead scattered across various parts of the plan.

Restrictions for a given basin may vary from complete restriction of a particular activity to only partial restriction of, e.g., selected scopes of functions (such as permission to build artificial islands, but only for the port function). In addition, restrictions may be permanent or temporary (e.g., temporary protection of salmon, or protection of bats during their hibernation periods). This variation in scope and timing, as well as those related to limitations imposed by higher-level documents [29], means that the logical structures of the provisions of the three plans are somewhat different. It should also be underlined that these differences mainly result from different interpretations of the regulations by the planning teams.

An extremely important issue in defining the plans was the scale of the plans being developed. The plan developed for all marine areas of the Republic of Poland required a less detailed approach than the plans currently being developed for individual ports. For this reason, the level of precision of the definitions was also different. It seems that once the planning experience is gathered and all the plans are adopted, a broad discussion with all the planners, led by the maritime administration, should take place as part of monitoring the plan implementation process to introduce improvements and enhancements, including, among other things, those related to increasing the flexibility of detailed provisions. Thus, the first phase of monitoring should consist of a discussion of the provisions of the individual plans to correct the definitions, the general provisions and the detailed provisions included in the basins cards.

While it is relatively easy to regulate the development of port areas, e.g., by issuing permits for marine structures, based on planning provisions, the safety of navigation and other traffic in ports is subject to other regulations. Port waters are, by definition, managed by the maritime administration through the harbour master or chief mate, based on the port regulations. This issue was regulated in the Polish MSP process by inviting harbour masters into the process of consultations of particular draft plans. Still, it is therefore important to consider the relationship of the port regulations to the provisions of the plan, and to determine the hierarchy between the two regulations.

The experiences, both negative and positive, gathered during the first MSP process in Poland indicate places for possible corrections and more precise coordination, and open up a broad discussion on the detailed solutions applied in maritime spatial planning.

## 6. Conclusions

Maritime spatial planning, especially on a detailed scale, is a relatively new issue, not yet fully established, in which some uncertainties can be noticed. In this context, the effects and evaluation of the fact that the draft plans are drawn up by different planning teams appears to be an important area of research. The Polish experience in the development of detailed plans for port areas carried out in separate proceedings, and therefore often by different planning teams, shows that it is extremely valuable for the institution responsible for the implementation of the plan to prepare in advance such a legal system in which, irrespective of

each project developer, the final effect will have a structure, form and nomenclature that can be compared across projects. The noted structural content discrepancies appeared despite the validity of the Regulation [30]. The authors showed that there are significant differences in the definitions of even the primary functions for the designated port water areas using the example of differences between the plans for the Gdańsk, Szczecin, and Elbląg ports. This introduces conceptual inconsistencies that might be difficult to understand for a potential investor, who will have to relate the same type of investment to different definitions in different ports. Given that the ports' areas are managed by different Maritime Offices, these inconsistencies might further influence the plans' interpretations and needed decisions.

Analysing the process of elaboration of maritime plans for water areas of the three Polish ports (Elbląg, Gdańsk and Szczecin), the following conclusions can be drawn:

- planning the port water areas on a detailed scale brings methodological challenges;
- excessive generality in defining functions can lead to interpretation problems and investment uncertainty;
- beyond the legally binding Regulation [30], some guidance on how to prepare the plans and interpret particular definitions of functions should be prepared, as the analyses shows that the plans created by different planning teams differ from each other;
- the maritime administration should ensure coherence between detailed plans elaborated by different planning teams, as currently they are not fully coherent in terms of interpretation of the functions' definitions and structures of the plans;
- the process of elaborating the detailed plans for Polish port areas exhibited more land-sea challenges, such as the still insufficient dialogue between the maritime administration (responsible for planning in the port's waters), cities authorities (responsible for land planning) and port authorities (responsible for strategic planning of the whole port area). Such challenges were recognised only during the planning process and require further in-depth research into the nature of these conflicts (content-wise or competence-wise) and the possibility of resolving them in subsequent planning cycles;
- defining the function of the basin might in some circumstances introduce some functional limitations on land;
- detailed plans create better knowledge about the port area, which is available to all interested parties;
- the process of plan elaboration should involve all stakeholders.

The basic activity in the construction of the plans is to allocate space to different primary functions. For such designated basins, the permissible functions are given and the detailed provisions are created, defining the prohibitions or restrictions on use, planned public purpose investments and conditions for the use of the port's waters. However, the plan does not fully define the acceptable forms of development. It is worth further examining whether, in practice, the provisions in the port's plans, despite being agreed with the stakeholders operating in land areas adjacent to the waters, enable the harmonisation of functional developments in both the land and water parts. The local spatial development plans are in force on the land, but they have slightly different conceptual assumptions and a different degree of resolution of the entries. It would be interesting to monitor if such differences result in a lack of functional coherence or if this is not an issue. Another challenge is that the port's plans do not explicitly mirror the provisions of the port's strategy as the plan's provisions should take into consideration all human activities in the area, especially when the port's waters are located in a city centre. Such a coordination challenge should also be a subject of monitoring and evaluation with regard to the port's plans. This approach resulted from the need for flexible planning in conditions of dynamic changes, especially in changing socio-economic and political conditions both in the global and local context.

It also seems that the involvement of ports' authorities in the process

of drafting plans of port water areas should be stronger in order to better secure space for their strategic development goals. Therefore, it can be concluded that despite some methodological challenges, reserving areas for functions desired in the future is an extremely important achievement of the plans created for the port waters, which is conducive to stabilising the spatial planning in the medium term in the areas where the competences of the port authority, maritime administration and municipal authorities intersect.

#### CRediT authorship contribution statement

**Ernest Czermański:** Conceptualization, Supervision, Writing-Original Draft, Writing – Review & Editing, Project Administration, Funding Acquisition. **Magdalena Matczak:** Methodology, Formal analysis, Investigation, Resources, Writing – Original Draft. **Aneta Oniszczyk-Jastrzābek:** Investigation, Resources, Data Curation, Writing-Original Draft, Visualization. **Karolina Krośnicka:** Conceptualization, Methodology, Investigating, Writing-Original Draft, Writing – Review & Editing. **Joanna Witkowska:** Investigation, Writing-Original Draft, Validation, Resources, Visualization. All authors have read and agreed to the published version of the manuscript.

#### Declaration of Competing Interest

The authors declare no conflict of interest.

#### Data Availability

No data was used for the research described in the article.

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