

## CHANGES AND DEVELOPMENT DIRECTIONS IN THE SPATIAL DEVELOPMENT OF SMALL PORT TOWNS ON THE HEL PENINSULA FROM 2005 TO 2022

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### ABSTRACT

**Motives:** This research was undertaken in response to the small number of studies addressing the issue of changes in the spatial development and functions of small port towns.

**Aim:** The aim of this study was to identify the changes that have taken place in the space of the towns of Hel and Jastarnia in the context of permanent buildings. The dynamic development of the tourist function contributes to the degradation of the regional identity of the space and the unique character of the buildings in the towns that used to be fishing villages.

**Results:** Tourism is the driving force of the local economy in both towns, which is reflected in the local employment structure. Tourist traffic is linked to the satisfaction of tourist needs, including infrastructure. The total number of buildings increased by 36% in Jastarnia and by 43% in Hel during the study period. The increase in the number of residential and tourism-related buildings is particularly noticeable. The increase in the number of residential buildings is not correlated with the demographic situation of the two towns, but results from the development of their tourist functions.

**Keywords:** small port town, seaside towns, spatial planning, tourism, tourism development, Hel Peninsula

### INTRODUCTION

Hel Peninsula is one of the most attractive and unique regions in the country. One of the characteristic elements of small towns in Hel Peninsula is the presence of a seaport. These ports have small reservoirs, occupying a small area, and therefore do not overwhelm the town with their size. An element that integrates small towns and their ports is open quays stretching along the waters (Palmowski, 1995). Ports in small coastal towns were once one of the main factors ensuring the economic activation of coastal

municipalities, through the jobs and income they generated (Nowaczyk, 2015). Due to their size, their primary function is to serve the fishing (Palmowski, 1995). Ports in small towns, such as Hel and Jastarnia, are multifunctional economic structures. In recent years, there has been a noticeable regression in fishing activities (Nowaczyk, 2016). The systematically declining income from fishing has translated into the development of tourism (Szwichtenberg, 1996).

Among the biggest tourist attractions in the Baltic Sea in Poland, tourism geographers point to the Hel Peninsula in the first place. The Hel Spit is a unique

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ecosystem in the country, combining natural, landscape, climatic, and historical values (Borkowski, 2019). The climate of the coastal area is characterized by the smallest diurnal temperature fluctuations. The course of temperature extremes during winter and summer also shows the smallest range here, compared to other areas in Poland (Kiełczewska-Zaleska, 1956). The rate of change and the scale of investments undertaken for the development of the tourism sector in seaside towns are high. This is primarily the result of the ever-increasing tourist traffic. As a consequence, buildings associated with servicing the maritime economy are disappearing in the townscape at the expense of the development of buildings associated with the tourist economy. Increased tourist traffic and the density of infrastructure pose a significant threat to the natural environment of the Peninsula (Soldatke et al., 2023). Tourists using what are termed the “3S” – sun, sea and sand (Alipour et al., 2020) assets are of great social and economic importance. Mejjad et al. (2022) emphasise that the extensive and uncontrolled development of the tourist industry may adversely affect natural coastal areas. Both anthropogenic and natural hazards (e.g. erosion, storm surges) can pose instability to human well-being and cause significant damage to economic, social, and cultural assets (Fitton et al., 2020).

The spatial changes occurring in coastal settlements, including small port towns, can be considered in two categories. The first group is land use change in the context of permanent development, which is the focus of this study. On the other hand, the second category is the seasonality of tourist development, due to the non-permanent nature of the development – associated with the holiday season. Grossi and Mussini (2021) indicate that seasonality means that tourist inflows tend to be concentrated at certain periods of the year. When fluctuations are repeated with similar timing and magnitude from year to year, they are referred to as seasonal fluctuations (Grossi & Mussini, 2021). The availability and distribution of leisure time during the holiday season translates into the leisure time required for tourism (Sun et al., 2022). The phenomenon of seasonality of land use is

a result of increased tourist traffic during the summer period for the Hel Peninsula. It is often not worthwhile for local entrepreneurs to maintain permanent buildings all year round, due to the seasonal demand for their services (Getz, 2008). For this reason, they provide services in temporary buildings during the holiday season (Soldatke et al., 2023).

The purpose of this study is to indicate the changes that have occurred in the space of the towns of Hel and Jastarnia between 2005 and 2022 in the context of permanent buildings. The literature on spatial change in small port towns, taking into account the function and character of buildings, is scarce.

The article consists of six parts. The introduction (1) presents the importance of the port of Hel and Jastarnia and the impact of tourism on the spatial shape of the two towns. The chapter on research methods and tools (2) presents the five stages of the research. The third chapter (3) deals with the characteristics of the study area and the definition of a small port city. The results (4) are divided into four sections covering: (a) the employment structure of Puck County, (b) tourism traffic, (c) tourism function and (d) changes in permanent buildings between 2005 and 2022. The discussion (5) concerns the impact of tourism development on land use in both towns and the presentation of options for regulating development. The final part of the article is the conclusions (6).

## MATERIALS AND METHODS

The main materials used in the study are data such as orthophotos from the period 2005–2022. An orthophotomap is one of the basic elements of survey image processing. An orthoimage created based on scanned aerial photographs, devoid of distortions resulting from the angle of inclination or denivelisation of the terrain, provides information about the terrain that was up-to-date on the date the photo was taken (Gołuch, 2002). Maps were obtained from the website [geoportal.gov.pl](http://geoportal.gov.pl) (2023b), which serves as the central node of the Spatial Information Infrastructure in Poland, and using a plug-in in the Geographic Information Systems (GIS) program – QGIS “Archival

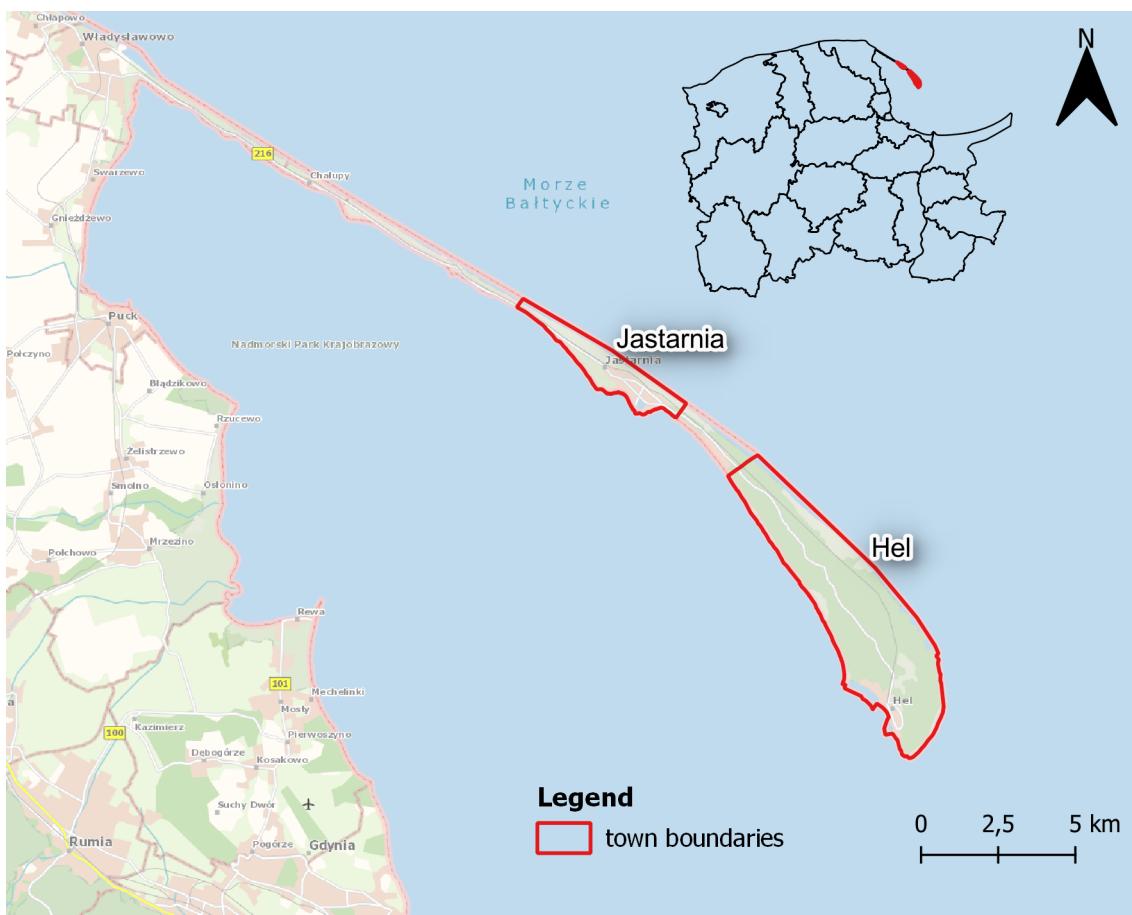
Orthophotomap". In this way, orthophotomaps from the years 2005, 2011, 2014, 2017, 2020, and 2022 were obtained. A vector layer presenting buildings, derived from the Topographic Database 10k – "BDOT10k", was also used in this work. This database covers the area of Poland and contains information on land use – topographic objects at a scale of 1:10 000 (Rubinowicz, 2017). Other materials used in the study were obtained from the Central Statistical Office (2025b), the Statistical Yearbooks of the Maritime Economy (2025a), and the Spatial Information Systems of the Municipality of Hel (2025) and the Municipality of Jastarnia (2025).

The study used quantitative and qualitative methods of data analysis. The study can be divided into five stages. The first involved a critical analysis of the literature on port and coastal towns – spatial development, tourism development of coastal towns, and functional and spatial transformations of small towns. The result was to propose the author's definition of small port towns. The second stage involved demonstrating an increase in employment of Puck County residents in the tourism economy. The next stage concerned the presentation of changes over time in tourist traffic and the identification of the tourism function of the study area using selected indicators. The indices used were: tourism development – Baretje-Defert and tourism intensity – Charvat and Defert. The fourth stage of the study consisted of a retrospective analysis of the changes taking place in the spatial development of the selected localities using an observation method. The collected data was analysed in QGIS software version 3.28.9. Each building was assigned information on the year of its identification in the town space. Based on the analyses carried out, cartographic studies depicting changes in the town's spatial development between 2005 and 2022 were prepared. Additionally, based on the cartographic studies, spatial changes were also presented in the form of selected statistical information. The final stage of the research was a field search and an observation method, resulting in the author's photographic documentation. This made it possible, above all, to show the changes in the character of buildings in small port towns.

## RESEARCH AREA

The study concerns small port towns located on the Hel Peninsula. According to the definition of the Central Statistical Office – "GUS" (2011), small towns are units with city rights, whose population does not exceed 20,000. A port city, according to Flis (1985), should be understood as "a city whose basic city-forming element is the transshipment of goods and the transfer of passengers from the land road to the waterway and vice versa". Krośnicka (2018) points out that port cities are characterized by a different spatial structure compared to inland cities. The differences are determined by the transport and logistics function performed and also by the coastal/waterside location (Krośnicka, 2008). In Poland, 15 towns are fulfilling both criteria presented, i.e. the term "small town" and "port city", of which 6 are located within the administrative borders of the West Pomeranian Voivodeship (Stepnica, Kamień Pomorski, Dziwnów, Nowe Warpno, Wolin, Darłowo), 7 are in the Pomeranian Voivodeship (Ustka, Łeba, Puck, Władysławowo, Jastarnia, Hel, Krynica Morska) and 2 are in the Warmińsko-Mazurskie Voivodeship (Tolkmicko, Frombork).

As Palmowski (1993) pointed out, the term "small port" is a subjective concept. In general, its role boils down to a complementary function among all the ports of a country (Palmowski, 1993). According to the Act of 20 December 1996 on Sea Ports and Harbours (1996), there are 4 ports of fundamental importance for the national economy in Poland – in Gdańsk, Gdynia, Szczecin and Świnoujście. On the Polish coast, there are 29 seaports not of primary importance for the national economy and 46 marinas (Uchwała nr 33/2015, 2015). The remaining ports of non-core importance for the national economy are most often referred to as 'small ports'. A definition of a 'medium port' can also be found in the literature. For audits carried out by the Supreme Chamber of Control – "NIK", a division of seaports in Poland into three groups was adopted: large, medium, and small (Najwyższa Izba Kontroli, 2018). According to the criteria adopted by the NIK at that time, there are



**Fig. 1.** Location of the small port towns analysed  
Source: own elaboration based on distributed data (2024).

6 large ports (including in Hel), 6 medium ports, and 21 small ports (including in Jastarnia) on the Polish coast (Jasiurska-Kluczek & Malcharek, 2019).

Additionally, the division of seaports can be made based on the settlement units within which they are located. Seaports in Poland can be found in both rural and urban areas. Examples of ports in rural areas are Mrzeżyno in the West Pomeranian Voivodeship, Rowy in the Pomeranian Voivodeship, and Kąty Rybackie in the Warmińsko-Mazurskie Voivodeship. Going further, seaports occurring in urban areas can be divided according to city size groups – small, medium, and large. According to the criteria of the Central Statistical Office (2011), in small towns, the number of inhabitants does not exceed 20,000 people, in medium-sized towns the number

of inhabitants ranges from 20,000 to 100,000 and in large cities the number of inhabitants reaches over 100,000. According to the criteria presented based on the number of inhabitants, Kołobrzeg, Świnoujście and Police in the West Pomeranian Voivodeship can be mentioned as a medium-sized port city. In turn, Szczecin in the West Pomeranian Voivodeship and Gdańsk and Gdynia in the Pomeranian Voivodeship are examples of a large port city.

For the application of the term 'small port', there are no unambiguously accepted and specific indices to qualify it into such a group. Given this, the paper uses and clarifies the phrase 'small port towns', which has clear criteria based on which a locality can be classified into a group of small port towns.

The study area was narrowed down to small port towns located on the Hel Peninsula (Fig. 1). It has an area of 3,160 ha and a length of 34 km, comprising the municipality of Hel, the urban-rural municipality of Jastarnia, and partly the urban-rural municipality of Władysławowo. The scythe-shaped sand dike, the result of sea currents and wind activity, borders the Baltic Sea to the north and Puck Bay to the south (Kwiatkowska & Marks, 2016). The study did not include the town of Władysławowo, which meets the criteria of a small port town because most of the municipality's area is not located on a peninsula (Staszewska, 2004). Small port towns located on the Hel Peninsula include Hel and Jastarnia (Fig. 1).

## RESULTS

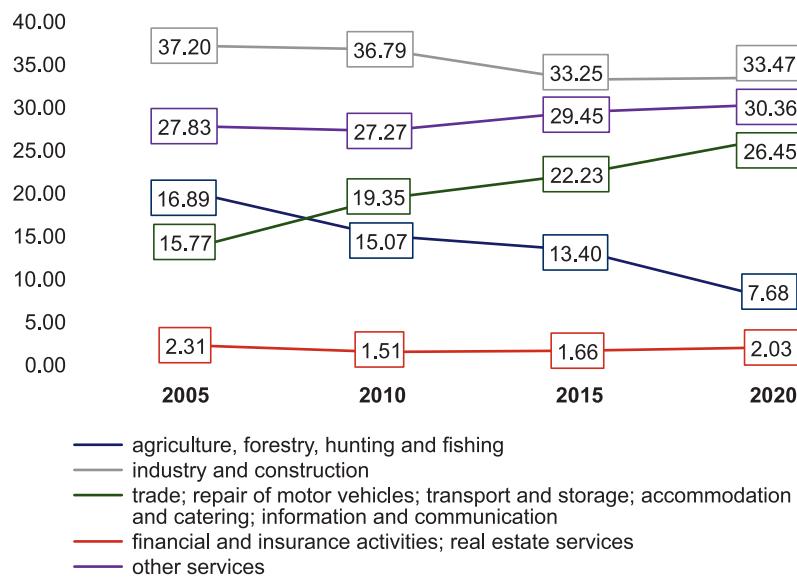
### The employment structure in Puck County

Most of the ports not having of primary importance to the national economy located in the Gdańsk Bay region is based on functions related to the development of tourism or fishing (Krośnicka et al., 2021). Based on the Report of the Supreme Chamber of Control (2022), the seaport of Hel is a multifunc-

tional economic structure that performs fishery service, transshipment and warehousing, passenger shipping, and sailing and is responsible for handling tourist traffic. The seaport in Jastarnia has three functions: fishery services, passenger shipping, and sailing. Unlike the seaport at Hel, the seaport at Jastarnia does not have transshipment and storage facilities (Najwyższa Izba Kontroli, 2022).

Ports of primary importance to the national economy are developing at an impressive rate, but other ports, including those in Hel and Jastarnia, are not experiencing such development (Jasiurska-Kluczek & Malcharek, 2019). In 2022, the port of Hel received 6.5% of all passengers arriving by ship in Poland. In relation to 2021, the port of Hel experienced a decrease of 13.9%. Compared to 2015, the number of travellers decreased in Hel by 18.1% (Główny Urząd Statystyczny, 2023a). There is a noticeable recession in the importance of ports to the economy of both towns. On the other hand, it is noticeable that the range of tourist and recreational services has expanded and there is a clear increase in demand for the development of these services (Pacuk & Michalski, 2002).

With the deterioration of the fish economy and the development of tourism, the share of people



**Fig. 2.** Employed by combined sections [%]  
Source: own elaboration based on GUS data (2024).

employed in the maritime economy has decreased and the share of people employed in the tourist economy has increased (Staszewska, 2004). Based on employment data for Puck County (to which the study area administratively belongs), the agriculture, forestry, hunting, and fishing section showed a decrease of 3.73% in the number of employees between 2005 and 2020 (Fig. 2). In the case of the combined section, which includes, *inter alia*, employment data for accommodation and catering, there was a 10.68% increase in employment over the 15-year period (Fig. 2). By comparison, in the 1970s and 1980s, in the fishing, forestry, and agriculture sector on the Peninsula, an average of 66.7% of the population in total employment was engaged mainly in fishing (Staszewska, 2004). The economic changes taking place in coastal towns condition the employment structure of the population. Segments of the local economy most closely linked to tourism in the broadest sense show an increase in employment (Beatty & Fothergill, 2004).

## Tourist traffic

Tourist attractiveness is the properties of an area or locality that arouse interest and attract tourists (Kurek & Mika, 2007). The Baltic coast is one of the most attractive regions in Poland in terms of tourism

(Durydiwka & Duda-Gromada, 2014; Kistowski et al., 2010). Among the tourist assets of small port towns, the presence of beaches, the proximity of sea waters and forests should be mentioned above all (Kistowski et al., 2010). The number of tourists using accommodation in the studied period of time in the case of the town of Hel increased almost tenfold, while in the case of the municipality of Jastarnia an increase of 47% was recorded (Fig. 3).

The dynamic growth of tourist traffic is related to the satisfaction of basic tourist needs, including accommodation needs. Data on the number of tourist accommodation establishments and facilities were obtained for the years 2012–2022. In the indicated time period, the number of tourist accommodation facilities in the town of Hel increased nearly threefold. In the case of Jastarnia municipality, fluctuations are visible (Fig. 4). In the town of Hel the number of total accommodation establishments in 2012 was 21, in 2022 it was 25, while the highest value was recorded in 2017 with a result of 31 (Główny Urząd Statystyczny, 2025b). In the municipality of Jastarnia, the number of total accommodation establishments in 2012 amounted to 44, and in 2022 presented a result of 47, while the highest value was recorded in 2016 with a result of 72 (Główny Urząd Statystyczny, 2025b). Referring to the number of nights provided to tourists,

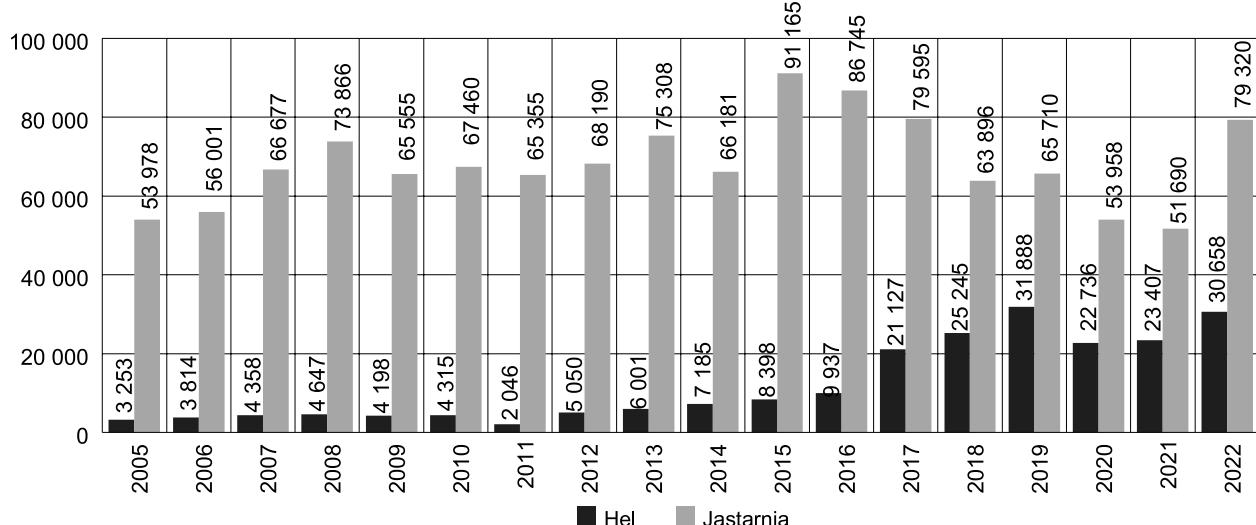
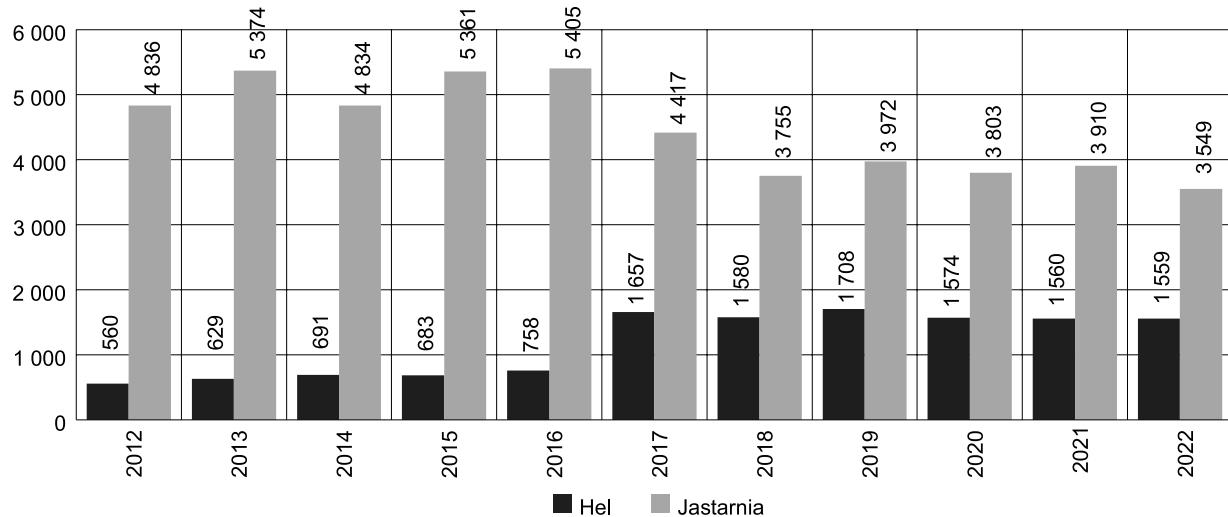


Fig. 3. Number of tourists using overnight accommodation

Source: own elaboration based on GUS data and Maritime Economy Statistical Yearbooks (2025).



**Fig. 4.** Number of tourist overnight accommodation places

Source: own elaboration based on GUS data and Maritime Economy Statistical Yearbooks (2025).

in the town of Hel in 2005 the result was 24,789 (Główny Urząd Statystyczny, 2025b), while in 2022 a value more than six times higher was recorded with a result of 156,858 (Główny Urząd Statystyczny, 2023b). In the case of the municipality of Jastarnia, 289,108 tourist nights were provided in 2005 (GUS), in 2022 277,532 (Główny Urząd Statystyczny, 2023b), while the highest number of tourist nights was provided in 2016, with a result of 406,791 (Główny Urząd Statystyczny, 2025a).

In the small port towns surveyed, tourist traffic presents an upward trend. The amount of tourist traffic translates into the importance of the role of tourism in the economic system of the locality and the degree of development of its tourism function (Kurek & Mika, 2007). The tourist reception area is associated with the provision of adequate conditions in terms of basic needs: accommodation, catering and other broadly understood accompanying services (Parzych, 2017; Soldatke et al., 2023).

## Tourism function

The elements that make up the tourism function of individual towns or areas are tourism assets, tourism development, and tourism traffic (Derek,

2008). Three indices were used to determine the degree of development of the tourism function in the municipality of Hel and the urban-rural municipality of Jastarnia. One of the indices of tourism development is the Baretje-Defert index:

$$W_{BD} = \frac{N_m}{L} \times 100 \quad (1)$$

where:

$N_m$  – number of tourist accommodation places;  
 $L$  – number of inhabitants.

Based on data from the Statistical Yearbook of the Maritime Economy (Główny Urząd Statystyczny, 2023b), the value of the index for the municipality of Jastarnia is 111, while the value for the town of Hel was recorded as 55. The interpretation of this index is viewed differently by many authors (Hendel, 2016). Adjusting the level of the index to the areas of Poland, Warszyńska (1985) indicates a value of 50 as the threshold value beyond which a well-developed tourism function can be indicated. Based on the presented interpretation of the index, both municipalities are characterized by a well-developed tourism function.

The Charvat index and the Defert index were used as indices of tourism intensity. The calculations used

data from the Statistical Yearbook of the Maritime Economy and data from the Central Statistical Office for 2022. The Charvat index is presented as follows:

$$W_{Ch} = \frac{N_n}{L} \times 100 \quad (2)$$

where:

$N_n$  – number of overnight stays provided;  
 $L$  – number of inhabitants.

The value of this index in 2022 for the municipality of Jastarnia was 7,884 and for the municipality of Hel – 5,201. However, the author of the index did not indicate a threshold value by which the area could be classified as well-developed in terms of its tourism function (Szromek, 2012). To compare the intensity of tourism, the Defert index was also used:

$$W_D = \frac{N_t}{P} \quad (3)$$

where:

$N_t$  – number of tourists staying overnight;  
 $P$  – area [ $\text{km}^2$ ].

The index allows a subjective assessment of tourist congestion in the municipality. For the municipality of Jastarnia, an index of 10,156 was recorded, and for the municipality of Hel a value seven times lower – 1,445. The literature on the subject does not present a uniform interpretation of this index (Szromek, 2012). Referring to the study area, it is also worth taking land cover forms into account when assessing the Defert index. In the case of the administrative boundaries of the town of Hel, as much as 86% of the area is covered by forests (Uchwała, 2003). In contrast, in the urban-rural municipality, within which the town of Jastarnia is located, forests constitute 35% of the area of the administrative unit (Uchwała, 2005). Despite the lack of unambiguous interpretation of the results based on the literature, simple calculations show that the municipality of Jastarnia presents many times higher values indicating the development of tourism functions and tourist congestion than the municipality of Hel.

It is worth noting that both towns experience increased tourism seasonally. The sea's natural attrac-

tiveness and weather conditions attract tourists especially in summer, from June to September each year. Seasonality is one of the main characteristics of the tourism industry (Dudziak & Borzyszkowski, 2016). Bigović (2011) generally indicates that seasonality means a certain annual regularity. Tourist seasonality causes periods of overcrowding to alternate with other periods (Corluka, 2019). The indices presented refer to annual data, but the holiday period plays a key role in the annual summaries.

## Changes in permanent housing between 2005 and 2022

The main tourist advantage of towns such as Hel and Jastarnia is their proximity to the sea and beaches. These continually attract travellers. Due to climatic conditions, a large influx of tourists is particularly noted in the summer period – from June to September. Intense tourist traffic is associated with satisfying the needs of those temporarily staying in the area. The key element of the tourist product of a specific area should be considered to be the existing tourist development, most often identified with its infrastructural resources. In material terms, the material base of tourism in a given area consists of four elements – accommodation, food (catering), transport, and accompanying facilities (Matuszewska, 2008).

Buildings from the BDOT10k database (Geoportal, 2023a) were examined for spatial changes in permanent buildings. According to the Construction Law (1994), a building is understood to be a structure which is permanently connected to the ground, separated from the space by means of building partitions and has foundations and a roof. Each building was assigned information about the year of its identification in the town space based on orthophotos from the years 2005–2022. Additionally, based on the function assigned to each building in the BDOT10k database, buildings were divided into three categories: residential buildings (1), tourist accommodation buildings (2), and other buildings (3) (Table 1). Residential buildings in Table 1 are understood as single-family residential buildings, residential buildings with two dwellings, residential buildings with three or more dwellings, and

**Table 1.** Changes in the different types of development of the analysed small port towns

Hel				
year	all buildings	buildings constructed by (year)		
		including		
		residential functions	providing accommodation	others
2005	590	306	64	220
2011	94	46	10	38
2014	11	6	1	4
2017	20	13	4	3
2020	40	30	2	8
2022	4	2	0	2
no data	44	36	2	6
Σ	803	439	83	281
Jastarnia				
year	all buildings	buildings constructed by (year)		
		including		
		residential functions	providing accommodation	others
2005	1,055	800	83	172
2011	237	186	11	40
2014	52	38	0	14
2017	71	61	1	9
2020	48	37	3	8
2022	32	29	2	1
no data	15	14	1	0
Σ	1,510	1,165	101	244

Source: own elaboration based on scattered materials (2024).

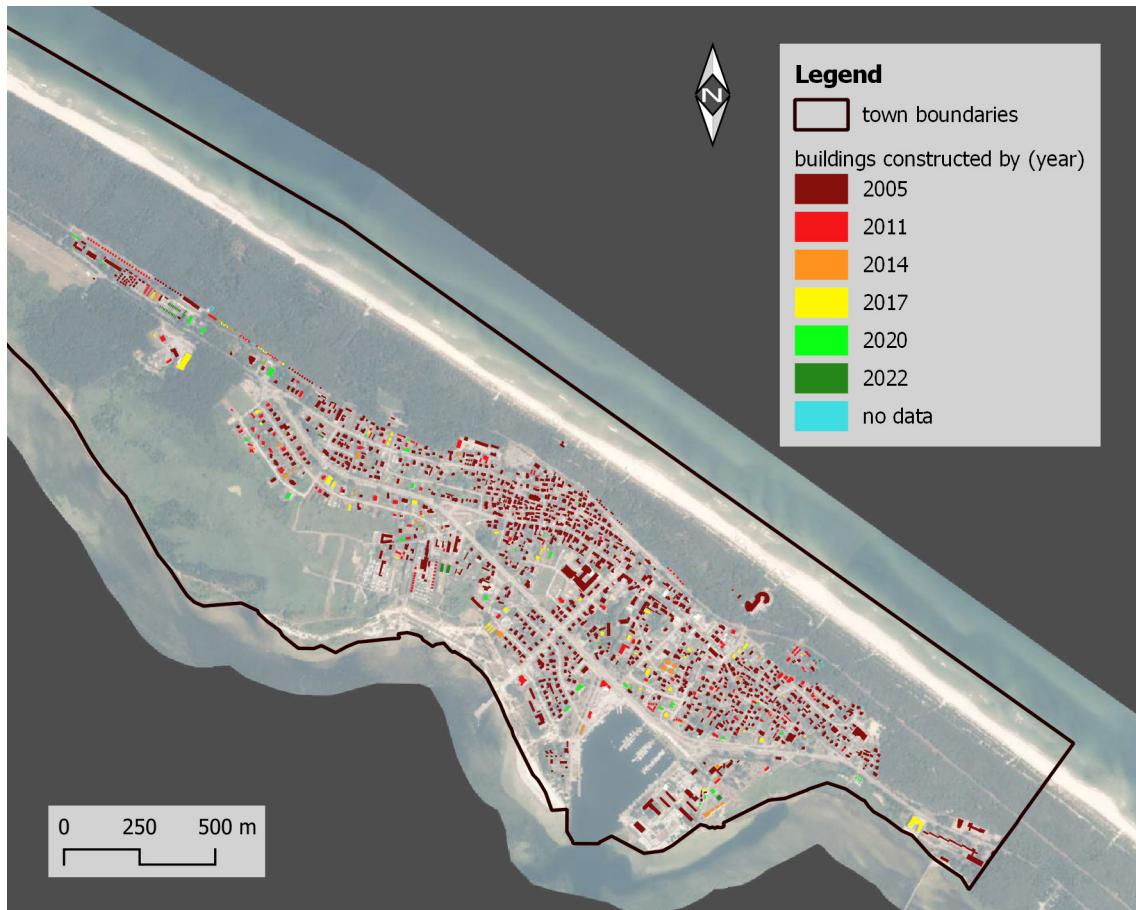
other residential buildings with three or more dwellings. Tourist accommodation comprises hotels, motels, inns, guest houses, camping cabins, chalets, and other tourist accommodation buildings (Rozporządzenie Ministra Rozwoju, Pracy i Technologii, 2021). ‘Other’ buildings in the table include office buildings, retail and service buildings, and industrial buildings.

In the spatial distribution of development, in the case of Jastarnia (Fig. 5), the development that was created between 2005 and 2022 complements the existing infrastructure. The new buildings were created in the vicinity of the existing ones. It is not possible to indicate areas of the town or settlements that have

grown later and constitute a separate area of the town, due to the age of the buildings. Due to the prevalent forest areas within the administrative boundaries, the built-up area of Hel is mainly concentrated at the base of the Hel Peninsula – 81% of the buildings (Fig. 6). Buildings that were constructed between 2005 and 2022 also complement the existing development, identical to Jastarnia. In the study area, there is no characteristic process in urban spatial development such as suburbanisation. This is due, among other things, to the limitations of the area – the towns are bordered to the north by the Baltic Sea and to the south by the Bay of Puck.

The number of all buildings between 2005 and 2022 in Jastarnia increased by 36% and in Hel by 43%. There was also an increase in the number of tourist accommodation buildings during the period studied. In the case of Jastarnia, this is an increase of 31%, and in Hel of 22%. The development of the accommodation base is linked to satisfying the basic subsistence needs of tourists, which is accommodation. The accommodation base is a component of the tourist function of a locality (Hendel, 2016).

Analysing only the data on the development of buildings with residential functions in Hel or Jastarnia, it can be concluded that the number of inhabitants is increasing every year. The number of residential buildings in Hel increased by 46% during the study period, while Jastarnia saw an increase of 43%. The demographic situation of the study area does not correlate with the increase in the number of residential buildings. In the case of Hel, the population has been declining every year since 2010 (Fig. 7). During the study interval, the number of inhabitants decreased by 28%. The same demographic situation applies to Jastarnia. The difference in population between 2016 and 2017 is due to the change in the status of the municipality. Up to and including 2016, Jastarnia had the status of an urban municipality. By ordinance, as of 2017, Jastarnia municipality obtained the status of an urban-rural municipality, which includes the town of Jastarnia and the rural area, the Kuźnica settlement, and the Jurata settlement (Rozporządzenie Rady Ministrów,

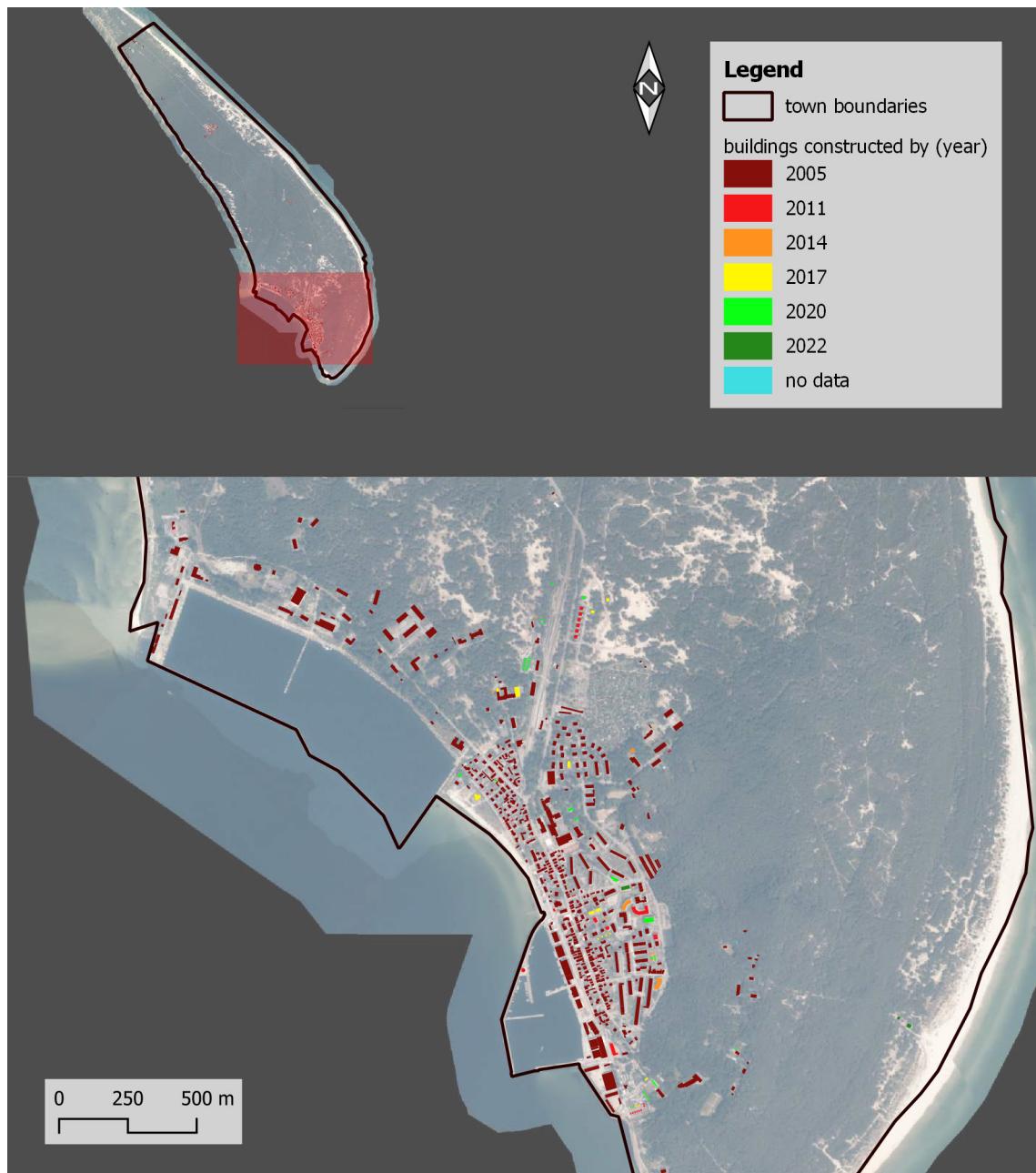


**Fig. 5.** Changes in the spatial development of Jastarnia  
Source: own elaboration based on scattered materials (2024).

2016). Despite administrative changes, the town has seen a decrease in population continuously since 2010. Between 2005 and 2016, the population decreased by 8%, and after the change in the status of the municipality, the population decreased by 4% between 2017 and 2022 (Fig. 8).

The increase in the number of buildings with a residential function, despite the population decline, is a result of the development of tourism in small port towns. This is because an important role of the accommodation base is played by rental accommodation in private houses. Due to the seasonality of tourist traffic, property owners make rooms available for rent for a specific period during the year. During this period, the occupants of the house use only part of the building, while in the off-season they have the

entire house at their disposal. The rental of private accommodation has a positive effect on the income of property owners (Dziegieć, 1988). Another aspect influencing the increase in housing is what is known as second home tourism. These are privately owned properties, built outside the place of permanent residence, which the owners use for leisure and recreational purposes (Mika, 1997). Owners of second homes can be referred to as the “invisible population” (Back & Marjavaara, 2017). Administrative systems, such as the National Census, record people as living in one place – a permanent residence. Pitkänen (2008) indicate that an important motive in the decision to buy or build a second home is the landscape. In the case of Hel and Jastarnia, the coastal location plays a key role.



**Fig. 6.** Changes in the spatial development of Hel  
Source: own elaboration based on scattered materials (2024).

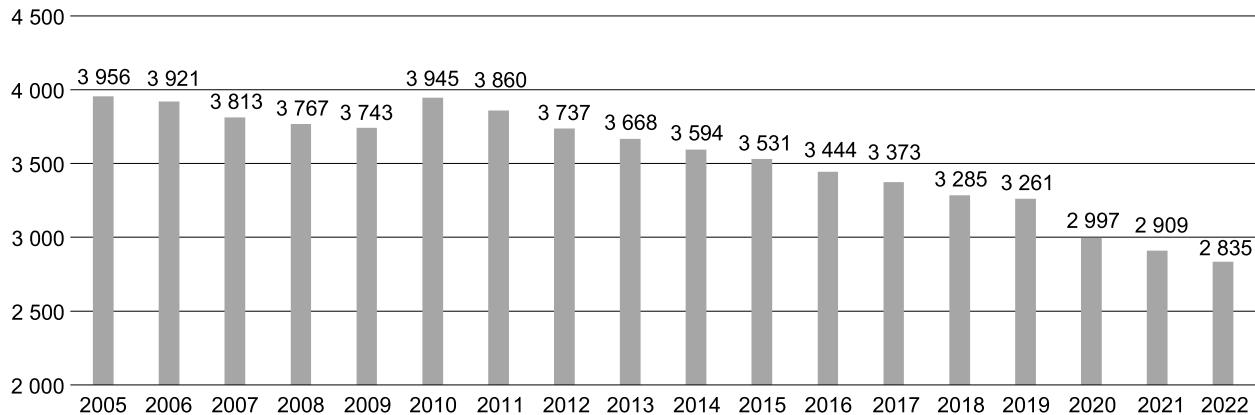


Fig. 7. Population in Hel [in persons]

Source: own elaboration based on GUS data (2024).

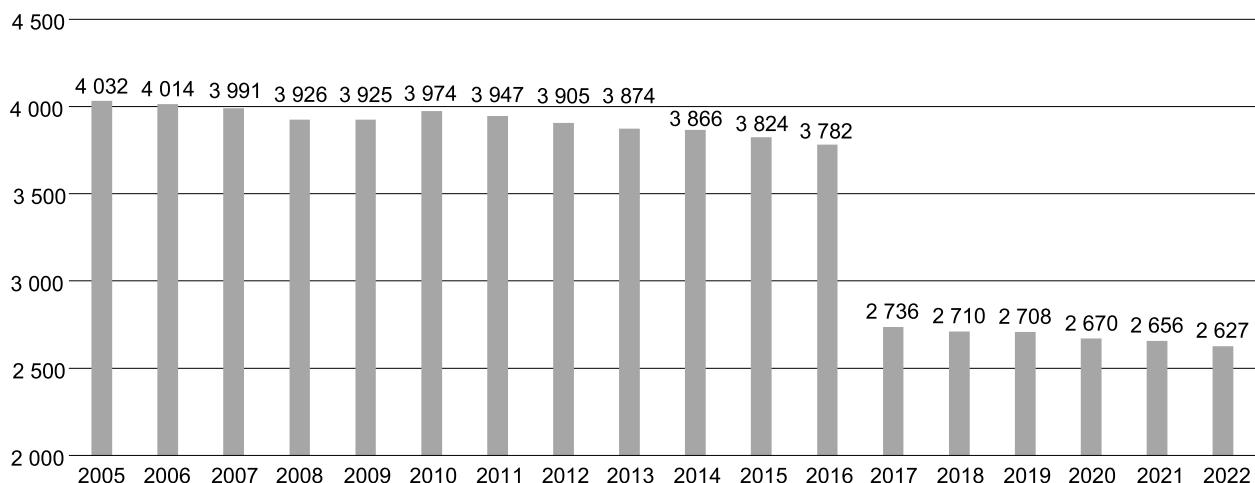


Fig. 8. Population in Jastarnia [in persons]

Source: own elaboration based on GUS data (2024).

## DISCUSSION

### Impact of tourism development on urban spatial planning

Hel was first mentioned in Danish documents from 1198. At that time it was a small fishing settlement, a Kashubian village under the name of "Gellen", which was the center of the herring trade. According to historical sources, Hel was granted town rights before 1266, granted under Lübeck law, and in 1378 the charter was confirmed by the Teutonic Knights (hel.info.pl, n.d.). On the occasion of the Teutonic Knights' privilege for Hel, the first references to

Jastarnia appear, under the name "Osternäs". In later historical documents the place names "Zesterna" (1570) and "Hesternia" (1627) appear, identified with Jastarnia. For the first time, the place name 'Jastarnia' appeared in historical sources from 1678 (Struck, n.d.). For many years Jastarnia was a small fishing village and in 1973 it was granted town rights (Kuźma, 2022).

The historical fact that both towns were once small fishing villages has influenced the nature of their spatial development. Fishermen's villages are a distinctive form of settlement due to their location and spatial arrangement, which results from economic and spatial relations (Staszewska, 2004). Rayss and

Górka (2013) indicate that there were two types of fishing villages on the Hel Peninsula: irregular island villages and street villages. The island village was distinguished by its irregular layout, which resulted from the limited availability of land and the organization of the fishermen's work. The type of island village included Jastarnia, which was characterized by compact buildings on a small scale (Fig. 10). An example of a street fishing village was Hel (Fig. 9). The characteristic element of this type of village was a regular frontage of buildings, set with a gable to the street (Rayss & Górk, 2013).



**Fig. 9.** Fishing house in Hel

Source: photograph taken by the author (2024).



**Fig. 10.** Fishing house in Jastarnia

Source: photograph taken by the author (2024).

Both small towns constitute the cultural landscape of the fishing villages. Fishermen's villages were distinguished from other towns by the type of buildings distinguished by small, timber-framed fishermen's houses usually built of brick (Wites-Gocel, 2022). Based on the field search carried out, traces of former buildings can be identified in both Hel and Jastarnia in today's townscape (Fig. 9, 10). There are also houses in the townscape which, with their volumes and gabled roofs, indicate that they were fishing houses. However, the renovations that have been carried out, particularly the facades of the buildings, have resulted in the original character of the buildings being lost to some extent.

Nowadays, small port towns are experiencing a process of change in the functions performed by ports and marinas, which indirectly results in a decline in their importance for the towns and villages within which they are located (Michalski & Kiniorska, 2023). For the local community, ports used to be one of the primary job generators (Nowaczyk, 2015). The importance of the existence of the port in both towns has diminished and the economic development force has become the tourist function. The increase in the tourist importance of a locality creates a certain correlation: the unique natural assets and location attract tourists, and the growing tourist traffic requires basic needs to be met. To this end, new infrastructure and buildings are created, as well as new jobs and sources of income for the local community.

As a result of the development of the tourism function of small port towns, their spatial development has followed (Fig. 5, 6). As Durydiwka and Duda-Gromada (2014) point out, the emergence of new tourist development elements, mainly large accommodation facilities, has been noticeable in recent years (Fig. 9, 10). Coastal tourist destinations are often insufficiently spatially planned, as a result of uncontrolled, improvised and hasty development processes (Soto & Clavé, 2017). The new buildings being constructed do not relate in their physiognomy to the original character of the buildings in Hel (Fig. 11) and Jastarnia (Fig. 12). Kwiatkowska and Marks (2016) point out that new developments are not connected to tradition and the

region. The expansive and uncontrolled spatial development of small port towns contributes to increasing spatial chaos and the obliteration of cultural identity, history, and tradition (Kwiatkowska & Marks, 2016).



**Fig. 11.** Contemporary buildings in Hel  
Source: photograph taken by the author (2024).



**Fig. 12.** Contemporary buildings in Jastarnia  
Source: photograph taken by the author (2024).

## How to influence urban spatial development?

One of the possibilities of controlling or defining the development of permanent buildings is the use of Local Spatial Development Plans – “LSDP”. According to legal regulations in Poland, a local plan

is an act of local law, consisting of a descriptive part and a graphic part. The prepared document is adopted in the form of a resolution of the municipal council (Act). The plan is an important tool in shaping space at the local level. It has a direct effect by providing for a specific land use (Nowak, 2013).

The basic objectives of spatial policy using, inter alia, local spatial development plans are spatial order and sustainable development. According to Woźniak (2015), the interpretation of spatial order in a given place and time is both the result of a certain cultural heritage and the resultant of the aspirations, ambitions and preferences of the members of a given community.

In order to determine the degree of coverage by Local Spatial Development Plans, data from the urban planning register located in the Spatial Information System for the town of Hel (2025) and the town of Jastarnia (2025) was used. The data was downloaded on 9 December 2024 and therefore presents an actuality as of that date. The downloaded sets of Spatial Planning Acts were analysed using GIS tools. The downloaded sets present, for each LSDP in force in the municipality, the descriptive part and the graphic part of the local law act, as well as its area of validity. On the basis of calculations in the QGIS software version 3.28.9, information was obtained on the total area covered by the LSDP for the municipalities of Hel, Jastarnia municipality and the town of Jastarnia. The percentage of coverage by local acts represents, respectively, the sum of the area of the MPZP in relation to the area of the administrative boundaries of the unit and the sum of the area of the MPZP in relation to the land area of the administrative units. The administrative boundaries of both municipalities, in addition to land, also include internal marine waters. Therefore, the share of the area covered by the LSDP in relation to the land area of the administrative units reflects the actual degree of coverage of the administrative units by acts of local law, as the calculation excludes the area of internal sea waters.

Local Spatial Development Plans in the study area are not sufficiently used by the municipal authorities. As of 9 December 2024, in the case of the town of Hel, only 0.61% of the land area of the town is regulated

**Table 2.** Degree of coverage by Local Spatial Development Plans of the town of Hel and Jastarnia

Administrative area	Area covered by Local Spatial Development Plans [km <sup>2</sup> ]	Share of the area covered by the LSDP in relation to the boundaries of the administrative units [%]	Share of area covered by the LSDP in relation to the land area administrative units [%]
Municipality of Hel	0.13	0.14	0.61
Urban-rural municipality of Jastarnia	3.83	3.68	49.04
Including the town of Jastarnia	1.55	30.69	36.99

Source: own elaboration based on scattered materials (2024).

by LSDP (Table 2). The urban-rural municipality of Jastarnia presents a better result, as 49.04% of the municipality's land area is covered by LSDP, while the town of Jastarnia itself presents a result of LSDP coverage of the towns' land area of 36.99% (Table 2).

As a local act, the local plan has many regulatory possibilities. Urban development involves the need to decide on the direction of changes to the space. This planning tool can regulate a range of development requirements, while above all maintaining spatial order and sustainability. Appropriate provisions in the Local Spatial Development Plan will make it possible to shape the development in such a way that the physiognomy and character of the new buildings will match those of the existing ones, complementing it in small port towns.

## CONCLUSIONS

For coastal towns, tourism development plays an important role. The Baltic coast is one of the most attractive tourist regions in the country (Durydiwka & Duda-Gromada, 2014). The presence of a seaport is also a characteristic element for small towns located on the Hel Peninsula. Ports in small coastal towns used to be one of the main factors providing jobs for the local community and providing income for both residents and municipalities. However, in recent years there has been a noticeable recession in the economic importance of the ports for both towns.

The functions of the small port towns of the Hel Peninsula have changed in the last two decades –

the service function related to tourism has started to dominate, at the expense of cargo handling and fishing functions. The intensive development of the tourism function in Hel and Jastarnia is evidenced by tourism development indices and tourism intensity indices. It is the area distinguished by the highest intensity of land use for tourism and the highest concentration of tourists per unit area (Durydiwka & Duda-Gromada, 2014).

Growing tourist traffic is associated with meeting the basic needs of tourists. Given this, new infrastructure and buildings are created, as well as new jobs and sources of income for the local community. The economy of coastal towns is based on tourism services and, to an increasingly lesser extent, on the maritime and fishing industry. The vast majority of residents are professionally involved in tourist services and activities for the benefit of tourists (Parzych, 2017). Working in the tourist services sector comes with a certain constraint, which is the seasonality of summer tourist traffic. The Sustainable Development Strategy of Jastarnia (2002) indicates that there is a lack of alternative sources of employment in the, and there is limited activity of economic entities in the off-season, which in effect generates unemployment.

Both towns were historically fishing villages. The fishing villages were distinguished from other towns by the type of buildings. Above all, fishing houses were a characteristic element of the landscape. The intensive development of the tourist function of both towns was followed by an expansive and

uncontrolled spatial development of the small port towns. The dynamic development of the tourist function degrades the regional identity of the space and the character of the buildings typical of small port towns. The new development introduces spatial chaos, which in effect degrades the *genius loci* of the individual small port towns, thus making them similar to each other (Borkowski, 2019). One way of controlling and regulating new development is for towns to make use of the planning tool provided for in Polish law, the local development plan.

The demographic situation of both towns presents a decrease in population, respectively for Hel between 2005 and 2022 by 28% (Fig. 7), for Jastarnia between 2005 and 2016 there was a decrease of 8%, and between 2017 and 2022 the population decreased by 4% (Fig. 8). There is a noticeable decline in the importance of the port in both towns for the local economy, with tourism being the driving force. This situation has translated into employment for residents. In Puck County, between 2005 and 2020, there was a 3.73% decrease in employment in the section including hunting and fishing, in contrast to the section including employment in accommodation and catering, where there was a 10.68% increase in employment (Fig. 2). Growing tourism requires various needs to be met, including infrastructure, which translates into the spatial development of towns. The number of total buildings between 2005 and 2022 in Jastarnia increased by 36% and in Hel by 43%. Focusing only on tourist accommodation buildings – the number of buildings increased by 31% in Jastarnia and by 22% in Hel (Table 1).

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