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The Polish Baltic coast as a tourist area in the light of tourism indicators

Abstract. The Polish coast is located at a considerable distance from the main areas of leisure tourism in Europe. In recent years this area has seen a significant growth in tourist accommodation and tourist traffic. The aim of this study was to analyse the quantitative and spatial differentiation of tourist traffic in the Polish coast. The analysis is based on statistical data from the Local Data Bank (BDL) maintained by Statistics Poland (GUS) about all seaside municipalities for which there is data on tourist arrivals. The author focuses on the most commonly used indicators of tourism activity: Baretje-Defert's index of the tourism development, Schneider's index of tourism intensity, Charvat's index of intensity of tourist traffic and Defert's index of tourist traffic density (based on data for 2014, except the number of tourist beds for 2019 year). The author found significant differences in the volume of tourist traffic across Polish coastal municipalities and between the Polish coast as a whole and other coastal areas in other European countries.

Keywords: tourist traffic, Polish seaside municipalities, seaside zone, Poland

JEL Codes: Q26; Z32

1. Introduction

Seaside regions are areas characterised by the highest concentration of tourist traffic on the global scale (Agarwal & Shaw, 2007; Birkic, Cubelic Pilija, & Kljaic Šebrek, 2014; Bramwell, 2004; Davenport & Davenport, 2006; Dronkers & de Vries, 1999; Egbuche et al., 2015; Klein & Osleeb, 2010; Pearce & Kirk, 1986;

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Wong, 1993). According to estimates of the World Tourism Organisation (United World Tourism Organization 2020), these regions account for a third of global tourism revenue. Polish seaside regions are also the most popular destinations of tourist traffic. Socio-economic changes in Poland since the 90s have also affected the coastal region. The socio-economic transformation of coastal industries, such as shipbuilding and fish industry, made it necessary to look for new paths of socio-economic development, one of which is tourism.

Tourism services are the main source of revenue for many costal communes in Poland. Moreover, changes in the organization of tourist traffic associated with a declining role of mass social tourism have triggered structural and quantitative changes in the development of tourism and tourist traffic in the Polish seaside region. Tourism along Poland's Baltic Coast depends strongly on favourable weather conditions, experiencing peak season during short summer holidays (Lijewski, Mikułowski, & Wyrzykowski, 2009). This is the time when the sea temperature is high enough for people to swim and bathe and when the offering of infrastructural facilities regarding transportation, accommodation and catering is the widest (Chabior & Owczarek, 2005; Girjatowicz, 2006). Tourism is particularly important in places, where recreational functions are enhanced by the presence of spa facilities (Hącia, 2016).

Tourism development can be measured by various indicators and synthetic measures. The main advantage of these indicators is that they can be calculated using publicly available statistical data at the national, regional and local level. The use of indicators is associated with the problem of interpreting results depending on spatial and demographic conditions of a given location and the conditions for the functioning of tourism in this area. The most popular indicators are those proposed by Baretje-Defert, Defert, Schneider and Charvat (Szromek, 2013). All of these indicators take into account the size of the accommodation base and the volume of tourist traffic. Baretje-Defert's index is used for measuring the development or density of tourist accommodation. It is defined as the number of bed places per 100 inhabitants and can be used for comparing the level of tourism development of different spatial units. Schneider's index of tourism intensity is the ratio of the number of tourists using accommodation services to the number of permanent residents in a given period. Charvat's index of tourism intensity is defined as the ratio of tourism intensity at accommodation establishments to the number of permanent residents in a given period. The scientific literature confirms the widespread use of these indicators in quantitative and spatial analyses of tourism development for different spatial units (Fernández-Latorre & Diaz del Olmo, 2011; Kyriakou Sourianos, & Vagiona, 2011; Maggi & Fredella, 2010; Niemczyk & Zacłona, 2013; Pearce & Kirk, 1986; Tsartas, 2003; Vojnovic & Knezevic, 2013). The main limitation of these indicators is the fact that their interpretation often depends on the criteria adopted by the researcher. The aim of the following study was to evaluate

the development of the tourist function in Polish coastal communes. The results reveal a variation in the level of tourist accommodation and tourist traffic across coastal communes and can be used for further research on the conditions and dynamics of the development of tourism in Poland's coastal zone.

1.1. The study area

The Polish coast of the Baltic is 528 km long. It covers an area of 19,000 km^2 and is divided into three macro regions: the Szczecin Coast, the Koszalin Coast and the Gdańsk Coast (Fig. 1). The region includes 91 settlements located within administrative borders of 38 seaside communes. Most of these settlements are classified as rural areas and only 16 have town privileges. There are three cities located in the metropolitan area of Gdańsk (Gdańsk, Sopot, Gdynia) with a total population of 900,000. Other major towns along the coast include Świnoujście, Międzyzdroje, Kołobrzeg, Ustka and Władysławowo.

2. Methods

2.1. Research methods

2.1.1. Sample description

Poland's coastal zone is strongly differentiated in terms of the level of tourism development, which is the result of both natural factors (climate conditions, coast type, length of the bathing season) and historical and socio-economic ones. The aim of the following study was to analyse this variation. The analysis is based on statistical data from the Local Data Bank (BDL)[1] maintained by Statistics Poland (GUS) about the population, tourist accommodation and tourist traffic in seaside municipalities for which there is data on tourist arrivals. Because most recent statistics were only partially available, the indicators of tourism development were calculated for 2014, with the exception of the total number of bed places, which was available for 2019.

2.1.2. Data collection and analysis

Information about the following quantities was collected:
   – the number of bed places at tourist accommodation establishments in all coastal communes in 2019,

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[1] https://bdl.stat.gov.pl/BDL/start

– the area and population of all coastal communes in 2014,

– the number of tourists who visited all coastal communes in 2014,

– the number of overnight stays at tourist accommodation establishments in all coastal communes in 2014,

– the number of foreign tourists who visited all coastal communes in 2014,

The following indices of tourism development were used (Smith, 2010):

– Schneider's index of tourism intensity (the ratio of tourists using accommodation services to the number of permanent residents in a given year),

– Charvat's index of tourism intensity (the ratio of nights spent at accommodation establishments to the number of permanent residents in a given year),

– the average length of a tourist stay at the coast,

– Defert's index of tourist traffic density (the number of tourists per 1 km^2).

Intensity of tourist traffic and the number of overnight stays in the coastal region was described in terms of the Lorenz asymmetry coefficient and was illustrated with concentration maps.

2.1.3. Justification of the methods used and their limitations

The indicators used in the analysis reveal a quantitative and spatial differentiation in tourist traffic recorded in Poland's coastal region and enable comparisons with other selected seaside areas in Europe. One important limitation of such comparisons is the fact that compared areas are of different size. For example, Lundgren found huge disproportions in the values of Defert's index for different Baltic ports (Lundgren, 2006). Many authors recommend using Baretje-Defer's index for analysing tourist development (Borzyszkowski, Marczak, & Zarębski, 2016; Defert, 1966), while others (Plettner, 1979) advocate the application of tourist nights index and tourist density index (Plettner, 1979).

3. Results and discussion

3.1 Distribution of the accommodation base

Tourism development is an important element of the socio-economic development of Poland's coastal communes, which is the highest in the country, as evidenced by the biggest number of accommodation facilities (Matczak, 2005; Meyer, 2006; Parzych, 2009). The seaside zone in Poland, like in other countries, experiences a high concentration of tourist traffic (Lundgren, 2006; Tsartas, 2003).

In 2019, bed places in accommodation establishments located in seaside provinces accounted for over 30% of Poland's whole accommodation base. The biggest number of accommodation establishments in the seaside area are situated in Rewal (rural commune – 212), Władysławowo (town – 187), Gdańsk (186), Kołobrzeg (town – 162), Kołobrzeg (rural commune – 153), Łeba (137). Communes with the smallest number of accommodation facilities include Międzyzdroje (the rural part of the urban-rural commune – 1), Smołdzino (2), Kamień Pomorski (the rural aprt of the urban-rural commune – 4), Będzino (rural commune – 6), Kosakowo – rural commune – 6). The majority of accommodation facilities along the Baltic Sea coast are located in the communes of the Szczecin Coast and in the western part of the Koszalin Coast. The seaside communes of the Gdańsk Coast, excluding the region of Tri-City, are considerably less developed in terms of the accommodation infrastructure. This is due to differences in settlement density and a considerably greater number of seaside towns in the Koszalin Coast and the Szczecin Coast. Other important factors include differences in the duration of the sea bathing season (which is much longer on the Szczecin Coast and the Koszalin Coast), the proximity of the German inbound tourism market. In terms of the size of the accommodation base, the seaside communes of Gdańsk, Władysławowo, Ustka, Kołobrzeg, Mielno, Świnoujście (Fig. 1) have the biggest resources (over 10.000 bed places each). Other researchers indicate significant differences in tourism development of other parts of the Baltic coastal zone (Lundgren, 2006; Schernewski & Sterr, 2002). Coastal mass tourism is characterised by the spatial concentration of tourist traffic (Bramwell, 2004). Areas with the highest concentration of accommodation facilities include the Tri-City metropolitan area, the section of the coast between Rewal and Ustronie Morskie as well as the communes
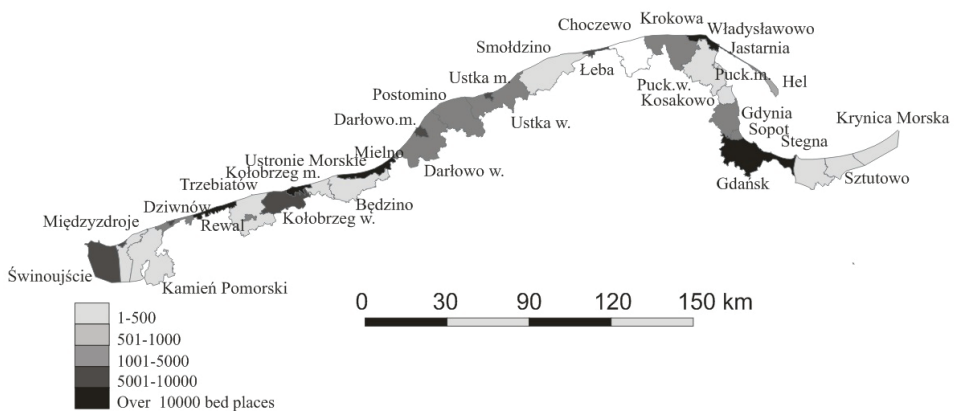

Fig. 1. The number of bed places in Polish coastal communes in 2019

Source: based on data from the Local Data Bank (BDL) maintained by Statistics Poland.

of Świnoujście and Międzyzdroje (Fig. 1). The concentration of accommodation facilities is associated with the proximity of large agglomerations and spas, which is confirmed by other authors (Smith, 2010; Leijzer & Denman, 2013).

3.2. Distribution of tourist traffic

According to data in the Local Data Bank maintained by Statistics Poland, in 2014 the seaside communes received 2,678,538 tourists, which accounts for about 25% of the total number of tourists in Poland. By comparison, the coastal region of Latvia was visited by 856,435 tourists which was about 76.8% of the total number of tourists in Latvia in 2009 (Muska & Bite, 2011). In 2013, the coastal part of the Kaliningrad Region received about 238,700 tourists (Afanasyeva 2014).

Communes with the largest number of tourists in 2014 included Gdańsk (719,412), Kołobrzeg (424,604), Sopot (250,912), Świnoujście (232,825) and Międzyzdroje (148,683), Rewal (144,844) and Gdynia (116,810), while the smallest numbers of tourists were recorded in the rural communes of Międzyzdroje (50), Kamień Pomorski (117), Smołdzino (619 people), Będzino (780) (Fig. 2).

3.2.1. Schneider's index of tourism intensity

In terms of Schneider's index, the highest intensity of tourist traffic was recorded in the communes of Dziwnów (the rural part) – 5671, Rewal – 3750, Krynica Morska – 3403, Łeba 2270 and Międzyzdroje (the urban part) – 2782 (see Fig. 3, Table 1).
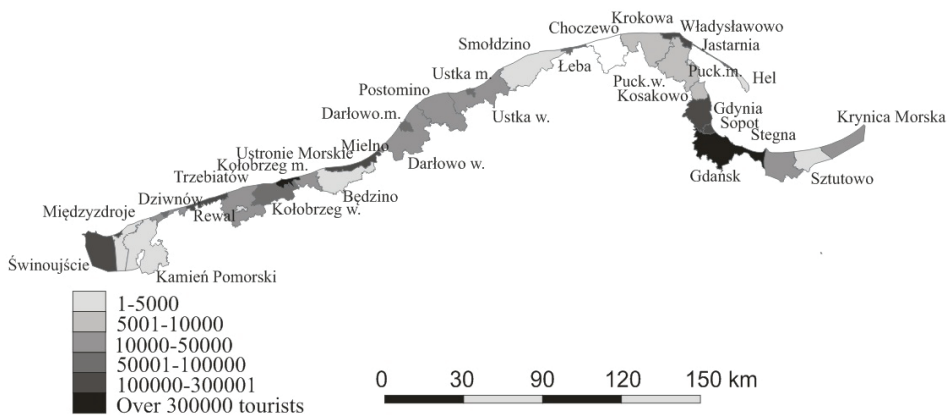

Fig. 2. The number of tourists visiting costal communes in 2014

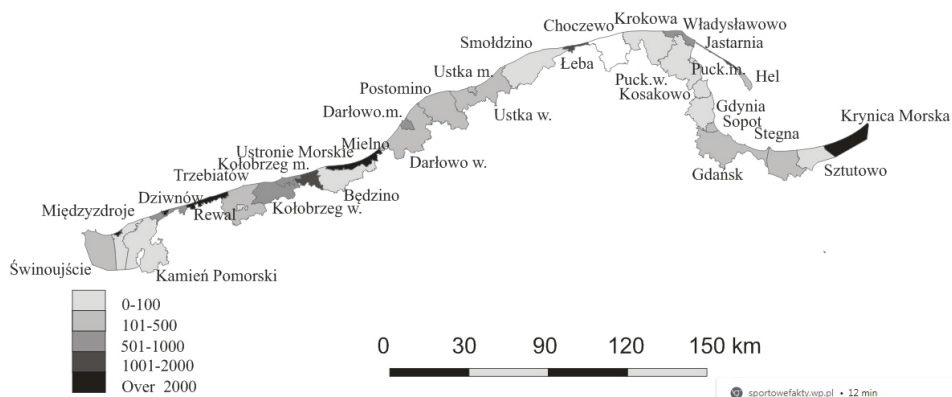Source: based on data from the Local Data Bank (BDL) maintained by Statistics Poland.

Fig. 3. Values of Schneider's index in coastal communes in 2014

Source: based on data from the Local Data Bank (BDL) maintained by Statistics Poland.

Table 1. Communes with the highest values of Schneider's and Charvat's indexes

Commune name	Commune type	Schneider's index	Commune name	Commune type	Charvat's index
Dziwnów (rural area)	urban-rural	5671.1	Dziwnów (rural part)	urban-rural	38285.1
Rewal	rural	3750.5	Rewal	rural	22374.7
Krynica Morska	urban-rural	3403.4	Krynica Morska	urban-rural	17092.8
Międzyzdroje (town area)	urban-rural	2782.8	Łeba	town	13336.7
Łeba	urban	2270.3	Ustronie Morskie	rural	12904.9
Ustronie Morskie	rural	1780.3	Międzyzdroje (urban part)	urban-rural	12130.8
Kołobrzeg	urban	917.9	Kołobrzeg	urban	7018.8
Kołobrzeg	rural	767.8	Trzebiatów (rural part)	urban-rural	4835.7
Sopot	urban	702.5	Kołobrzeg	rural	4604.9
Trzebiatów (rural area)	urban-rural	697.5	Dziwnów (urban part)	urban-rural	4235.8

Source: based on data from the Local Data Bank (BDL) maintained by Statistics Poland.

High values of Schneider's index were also obtained for the communes of Łeba. Dziwnów, Ustronie Morskie and Jastarnia. The lowest values were recorded for the commune of Choczewo (0.65), the rural part of Kamień Pomorski (2.1), the

rural part of Międzyzdroje (4.5) and for rural communes of Będzino (9.0) and Smołdzino (18.0). By comparison, in Europe the highest values of Schneider's index can be observed in coastal regions of Mediterranean countries. For example, the average value calculated for the Italian coast in 2008 was about 3800 (Maggi & Fredella, 2010).

3.2.2. Defert's index of tourist traffic density

The biggest number of tourists per 1 km^2 was recorded for the communes of Rewal – 3368, Łeba – 4809, Ustka (urban commune) – 7506, Jastarnia (urban part) – 8223, Sopot – 14,759, Kołobrzeg (urban commune) – 16,330 and Międzyzdroje (urban part) – 29,736. The lowest values of the index were recorded for the communes of Miedzyzdroje (rural part) – 0.45, Kamień Pomorski (rural part) – 0.59, Smołdzino – 2.38, Będzino – 4.69, Choczewo – 13.0 and Wicko – 19.74. Values of Defert's index density for coastal communes are many times higher than those for the remaining part of the country: the average value for Poland in 2010 was 77.74 (Niemczyk & Zacłona, 2013).

3.2.3. Inbound tourism in the Polish Baltic coastal region

Inbound tourism plays a very significant role in the tourism industry of Poland's coastal region. The last several years have seen an growing number of foreign tourists who decided to visit the Polish coast. In 2014, seaside communes were visited by almost 587,000 foreign tourists, accounting for 25% of all visitors in this region. This figure is much lower compared to other coastal areas in Europe,
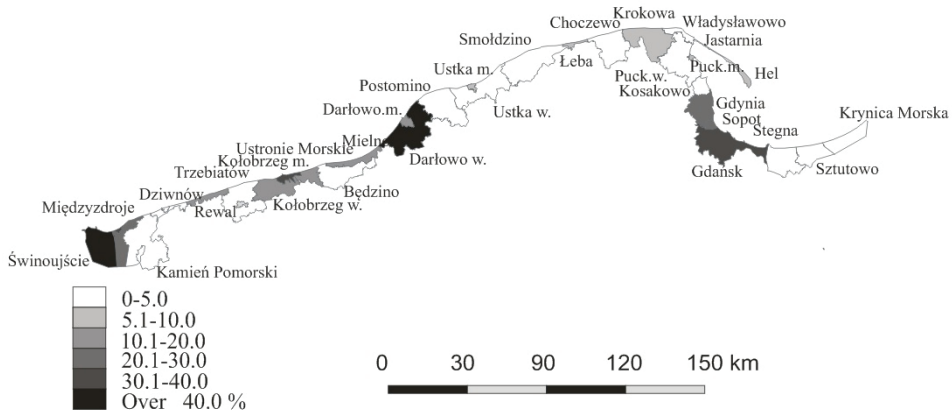

Fig. 4. The percentage of foreign tourists in the total number of tourists visiting coastal communes in 2014

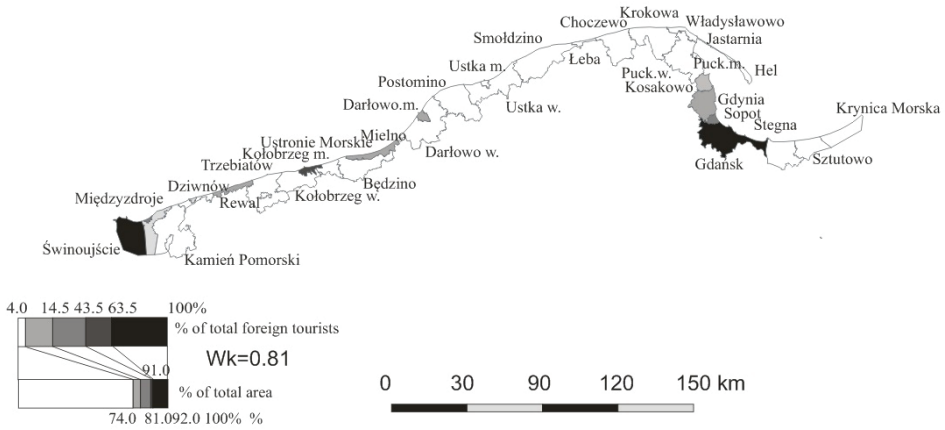Source: based on data from the Local Data Bank (BDL) maintained by Statistics Poland.

Fig. 5. Concentration of foreign tourists in coastal communes in 2014

Source: based on data from the Local Data Bank (BDL) maintained by Statistics Poland.

especially those around the Mediterranean Sea. For example, in 2006 foreign tourists represented 85% of all tourist arrivals to the coast of the Balearic islands (Garín-Muñoz & Montero-Martín, 2007) and in the case of Greek islands and other coastal areas of Greece, foreign tourists accounted for about 40% of all tourists in 2002 (Tsartas, 2003).

In 2014, the highest share of foreign tourists in the total number of tourists was recorded in the rural commune of Darłowo and in urban communes of Świnoujście, and Kołobrzeg (over 40% of all tourists). The lowest share of foreign tourists was recorded in communes situated along the coastal belt from Postomino to the metropolitan area of Gdańsk, where the share of foreign tourists did not exceed 5% (Fig. 4 and 5).

Most foreign tourists visiting the Polish coast are German – in 2014, they accounted for over 60% of all foreign tourists in Polish coastal communes (Fig. 6). Other foreign visitors came from Scandinavian countries, especially Norway, Denmark, Russia and Great Britain. The structure of foreign tourist traffic in the Polish coast is similar to that recorded in the Balearic islands and Greek islands and other coastal areas of Greece (Garín-Muñoz & Montero-Martín, 2007; Tsartas, 2003).

In 2014, the biggest number of foreign tourists visited the communes of Gdańsk 265,635), Kołobrzeg (urban commune) – 141,220, Świnoujście – 111,690, Sopot – 69 329. The communes least popular with foreign tourists included Choczewo, where official statistics indicated no foreign tourists, the rural commune of Kosakowo (6), the rural part Kamień Pomorski (3), Smołdzino (15), and rural communes of Choczewo (113), Kamień Pomorski (140).
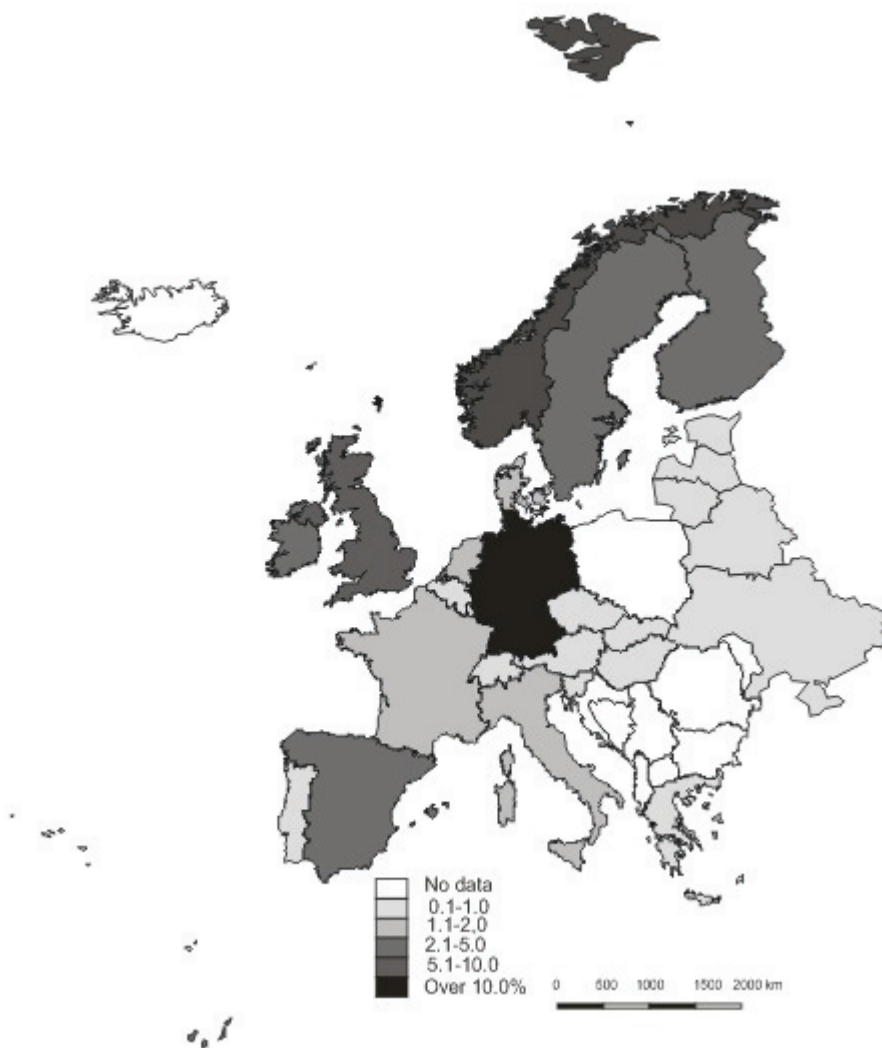
Fig. 6. Foreign tourists visiting coastal communes in 2014 by country

Source: based on data from the Local Data Bank (BDL) maintained by Statistics Poland.

As regards the density of foreign tourists in Polish coastal communes, the highest concentration of foreign tourists was recorded in the metropolitan area of Tri-City, in the region of Kołobrzeg and in the communes of Rewal, Międzyzdroje and Sopot (see Fig. 5). The distribution of foreign tourists in coastal communes is characterized by a high spatial disproportion, as shown by the map of concentration and the Lorenz asymmetry coefficient. As can be seen in the map, 63.5% of all foreign tourists who visited the Polish coast in 2014 stayed in communes that

occupied only 9% of the total area of the coastal region, which indicates a high degree of spatial concentration. The highest concentration of foreign tourists was recorded in Kołobrzeg, Gdańsk and Świnoujście. The Lorenz asymmetry coefficient was equal to $Wk = 0.81$, (0-0.25 – low concentration, 0.25-0.5 – moderate, 0.5-1.0 – high, Zioło 1968). Besides, in 2014, the more intense tourist traffic in the Tri-City agglomeration and Kołobrzeg was due to the influx of visitors in connection with to the European Football Championships.

3.2.4. Analysis of overnight stays and the average length of stay in the Polish coastal region

Another dimension that needs to be taken into consideration in the analysis is the number of overnight stays (see Fig. 7).

In 2014, 12,938,473 overnight stays of which 3,000,044 were nights spent by foreign tourists. Communes with the biggest numbers of overnight stays include Kołobrzeg (urban commune – 3,246,825), Gdańsk (1,688,650), Świnoujście (1,454,669), Rewal (864,111) and Sopot (686,390). Relatively high numbers of overnight stays were also recorded in Władysławowo, Ustka (urban commune), Sopot and Międzyzdroje (the urban part). The smallest number of overnight stays was recorded in rural areas of communes: Kamień Pomorski (658), Międzyzdroje (750), Smołdzino (2816), Będzino (3332). The Lorenz asymmetry coefficient of the cumulative distribution function describing the number of overnight stays of foreign tourists in individual communes amounted to $Wk = 0.84$.

Communes with the highest concentration of overnight stays include Gdańsk, Kołobrzeg (urban commune) and Świnoujście (see Fig. 8). Tourists resting in
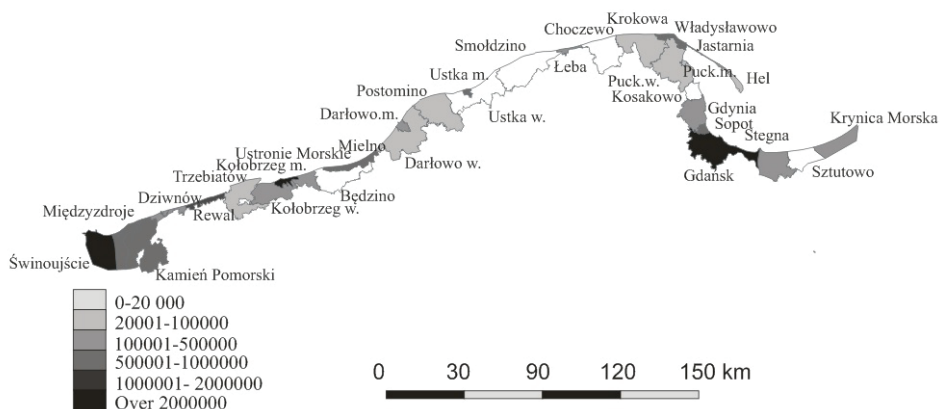

Fig. 7. The number of overnight stays recorded in coastal communes in 2014

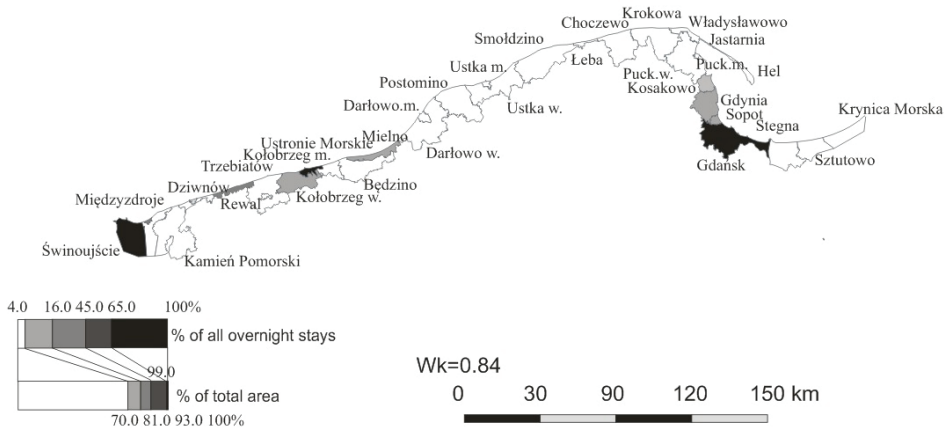Source: based on data from the Local Data Bank (BDL) maintained by Statistics Poland.

Fig. 8. Concentration of overnight stays by foreign tourists in coastal communes in 2014

Source: based on data from the Local Data Bank (BDL) maintained by Statistics Poland.

coastal communes spent about 12 million nights. Schernewski quotes a similar figure of about 13 million of overnight stays with regard to tourists visiting the German Baltic coast in 1998 (Schernewski & Sterr, 2002). The average length of stay calculated by dividing the number of overnight stays by the number of tourists amounted to 4.8 nights per 1 tourist. Muska and Bite (2011) show similar results for the Baltic coast in Latvia: 4.7 nights per 1 tourist in 2010 A much longer average period of stay of 9.7 nights was observed for tourists visiting Greek islands (Kyriakou Sourianos, & Vagiona, 2011). Similar figures have been recorded in coastal regions of Spain (Artal Tur, García Sánchez, & Sánchez García 2012) and in the Istrian Peninsula (Vojnovic & Knezevic, 2013). In the Italian coast the average length of stay is about 5 nights per 1 tourist (Maggic & Fredella, 2010). The results clearly indicate the length of stay depends on climatic conditions. The longest average stays were recorded in Świnoujście – 10.5 nights, Stegna – 9.1, Kołobrzeg – 9.3, Mielno – 7.8, Ustka – 7.4, Dziwnów and in the rural commune of Darłowo – 7.5. The reason why tourists, on average, spend more days in these places is connected with the fact that they are all popular holiday and benefit from a longer bathing season. Communes with the shortest average length of stay include Trzebiatów (1.23 nights per tourist), Ustka (0.54), Kosakowo (1.05), Dziwnów (1.96), Gdańsk (2.54) and Gdynia (2.17). These places are either big urban centres or have a less developed tourism infrastructure.

3.2.5. Analysis of Charvat's index of tourism intensity

Table 1 shows two measures of tourism intensity: Schneider's index, which is the ratio of tourists using accommodation services to the number of permanent resi-
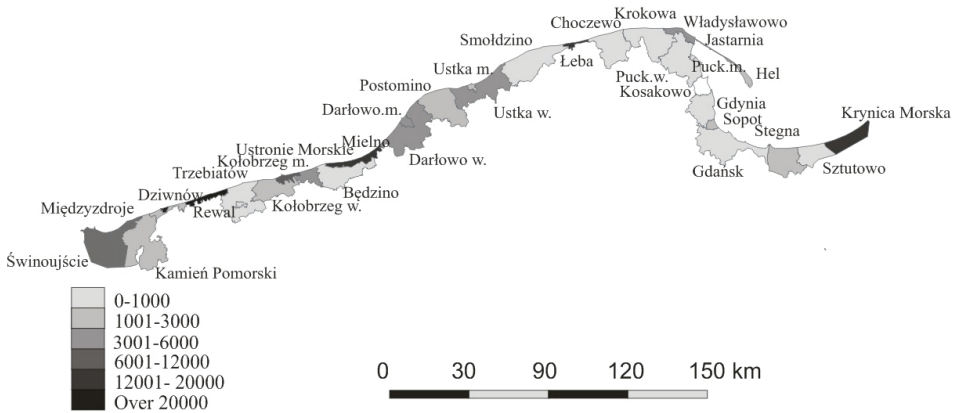
Fig. 9. Values of Charvat's index for coastal communes in 2019

Source: based on data from the Local Data Bank (BDL) maintained by Statistics Poland.

dents in a given year, and Charvat's index, which is the ratio of nights spent at accommodation establishments to the number of permanent residents in a given year.

Communes with the lowest values of Charvat's index include Kamień Pomorski (the rural part), Będzino, Smołdzino and Kosakowo (Fig. 9).

The index reaches its highest values for communes with the highest concentration of accommodation establishments in the coastal region. Values of Charvat's index for Polish communes are much lower compared to other coastal areas, especially Mediterranean coastal areas (Maggi & Fredella, 2010; Tsartas 2003). For example, Charvat's index for the Greek island of Rhodes was 82 982 in 2010 (Kyriakou Sourianos, & Vagiona, 2011).

3.2.6. Seasonality of tourist traffic

Tourist traffic in Polish seaside communes is highly seasonal. This fact is confirmed by results of many studies conducted over the years (Durydiwka, Duda--Gromada, 2014a, b; Matczak, 2005; Meyer, 2006; Parzych 2009). According to Hącia (2016), indicators of tourist traffic in Świnoujście are 34% higher in the summer months than in the remaining months of the year, and this difference is even higher in other coastal towns. One important additional element of the tourist offering provided by seaside towns during the holiday season is a wide range of festivals and other cultural events: e.g. the Sunrise Festival in Kołobrzeg, the Stars Festival in Międzyzdroje, the Light Festival in Ustka, the International Kite Festival in Łeba. The majority of tourists come in July and August. In 2014, tourist arrivals recorded in these two months in the two seaside provinces, Zachodniopomorskie and Pomorskie, represented 25.8% and 24% of all annual ar-

rivals, respectively. In some coastal communes of Italy tourist arrivals recorded in August account for 60% of the annual total (Maggi & Fredella, 2010). High seasonality of tourist traffic in most coastal communes in Poland is due to the weather conditions, which determine the relatively short bathing season. The only exceptions are communes which are known as popular spa destinations (Kołobrzeg, Świnoujście, Dąbki, Sopot).

A comparison of index values calculated for Polish coastal municipalities with results obtained for other European regions did not provide conclusive results because the compared areas were of different sizes. For this reason, it would be more appropriate to use synthetic measures that take into account not only quantitative data about tourist traffic but also the size of a given area and its population.

4. Conclusions

The analysis of tourist traffic in the Polish Baltic coast presented above reveals its main spatial and quantitative characteristics. The development and tourist traffic in seaside municipalities in 2014 was characterized by a considerable degree of variation in both quantitative and spatial terms. This variation reflects the number and quality of the accommodation establishment, as well as the length of the tourist season in the Polish Baltic coastal zone.

For one thing, it can be seen that accommodation establishments and tourist traffic were concentrated around big metropolitan areas and spa resorts. The intensity of tourist traffic (in 2014, except for data about the number of bed places in 2019) is similar to those recorded in other areas of the Baltic coastal zone but is significantly lower than that found in Mediterranean coast areas. This is due to less favourable climatic conditions, a shorter tourist season and the number and diversity of tourist accommodation establishments. It is also worth noting that in some Polish seaside communes there is a large percentage of foreign tourists.

Tourist traffic in the Polish seaside is highly seasonal, with most tourists arriving in July. Because of climatic conditions the bathing in most seaside destinations is relatively short.

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Polskie wybrzeże Bałtyku jako obszar recepcji turystycznej w świetle wskaźników funkcji turystycznej

Streszczenie. Polskie wybrzeże położone jest w znacznej odległości od głównych obszarów turystyki wypoczynkowej w Europie. W ostatnich latach na tym obszarze nastąpił znaczący wzrost bazy noclegowej i ruchu turystycznego. Celem pracy była analiza ilościowego i przestrzennego zróżnicowania ruchu turystycznego w polskiej strefie przybrzeżnej Bałtyku. Analizę przeprowadzono na podstawie danych statystycznych Banku Danych Lokalnych Głównego Urzędu Statystycznego dla wszystkich nadmorskich gmin turystycznych, dla których istnieją dane o frekwencji odwiedzających. Wykorzystano najczęściej stosowane wskaźniki rozwoju funkcji turystycznych: wskaźnik funkcji turystycznej Baretje i Deferta, wskaźnik natężenia ruchu turystycznego Schneidera, wskaźnik natężenia ruchu turystycznego Charvata oraz wskaźnik gęstości zaludnienia Deferta. Wyniki wskazują na znaczne różnice w ruchu turystycznym między różnymi gminami nadmorskimi w Polsce oraz między polskim wybrzeżem a wybrzeżami innych krajów europejskich.

Słowa kluczowe: ruch turystyczny, polskie gminy nadmorskie, Polska