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# DEMOGRAPHIC ASPECTS OF URBAN DEVELOPMENT IN TOURIST REGIONS IN POLAND

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**Abstract:** Demographic processes in well-developed countries constitute an urgent research problem especially in terms of developmental opportunities of local settlements. It is an important issue in tourist regions which allows to conduct appropriate population policy. If the impact of demographic factors on economic development turned out to be significant, it should become a subject of scientific and practical analyses. Pomerania Province is one of the most profitable tourist regions in Poland. The summer season and leisure tourism at the seaside are of the utmost importance. The analysis concerned the towns of Pomerania Province in terms of demographic changes and their impact on the economic development. The analysis was conducted in the years 1995-2020 and it covered the changes that had taken place before Poland joined the EU (2004) as well as the period of fully functioning market economy. Apart from the time period which gives a picture of trends and intensity of the changes, the towns were also distinguished in terms of size showing various trends in big cities and medium-size and small towns.

**Key words:** tourist region, towns, Pomerania Province, Poland, economic development, demographic changes

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## INTRODUCTION

A tourist region has been interpreted in many different ways in the subject literature depending on the researcher's interests. According to one of the more general interpretations, a tourist region is a relatively homogeneous area which is characterized by definite natural and acquired features (Liszewski, 2003) or a part of a physical space which is or may be related to tourist traffic (Mazurski, 2009). As many researchers notice, the notion of a tourist region as well as an attempt to delimit it is evolving and new categories to understand it are introduced (Kruczek, 2009; Butler, 1980; Bachvarov, 2003; Stoffelen, 2022). Nearly all the attempts at delimitation of tourist regions in Poland are based on their natural values and development of tourist facilities (Mazurski, 2009). However, the development of research on tourist economics highlights the necessity to take into consideration both the demand and the supply. Due to the development of tourism, the significance of tourist regions for territorial governments and appropriate regional and local policy is emphasized (Gaworecki, 2000; Gołembski, 2000; Kornak and Rapacz, 2001; Dredge, 2001; Koufodontis and Gaki, 2020). At present, there is a conviction confirmed by research (Logan and Molotch, 1987; Clark, 2003; Shoval, 2018; Musavenganea et al., 2020) that tourism is the most important factor enhancing growth of tourist regions including the development of cities and towns. Tourism generates income for the residents of those cities and towns and for their governments. It also impacts the expenditure structure which shows in greater care to keep the towns clean and tidy and develop the road and tourist infrastructure (Derek at al., 2005). Urban tourism understood in this way, when it is not the city's basic function but an additional one, may determine and facilitate demographic and social changes. A thorough theoretical and empirical analysis of relationships between demographic changes and local and regional development is presented in the study by R. Wiśniewski et. al. (2020). The authors point to a certain model of relationships between social and economic development and demographic processes which includes four main components: the level of general economic development which conditions the level of consumption, living conditions and the quality of life. The latter ones relate to the movements of people guided by their choice of a particular destination that constitutes the fourth and the last component of the model (Wiśniewski et al., 2020, p. 21). Numerous empirical studies undertaking an explanation of cause and effect relationships between economic development and demographic changes emphasize the complexity of those relationships and non-obviousness of the conclusions (Taylor and Hall, 1967; Leibenstein, 1975; Becker, 1992; Śleszyński, 2010; Johnston, 2019; Dolińska et al., 2020).

There are several tourist regions in Poland in of view of environmental determinism. They include the Carpathian Mountains, the Sudeten Mountains, the Lesser Poland Upland, the Masurian Lake District and the Coast.

The Carpathian Mountains is the only area with high mountain landscape. Natural values are the main attractions of the region. There are not many historical sites. Wooden architecture and vivid folklore constitute its main attractions. They attract mostly tourists who practise hiking, skiing and mountain cycling. The mountains also have a lot of recreational values (forests, clean air, lakes: Rożnowskie, Solińskie, Żywieckie). There are a few well-known health resorts (e.g. Krynica, Rabka). The Carpathian Mountains have varied tourist infrastructure and facilities with the best ones in the Silesian Beskids, the Tatra Mountains and Podhale. The Sudeten Mountains are one of the best developed regions in terms

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of tourism. They have varied geological structure and topography. There are accommodation and hospitality facilities, a well developed road network and a network of marked tourist trails. In the Sudeten Mountains there are numerous health resorts (e.g. Kudowa-Zdrój, Duszniki-Zdrój). The most attractive regions in the Sudeten Mountains are: Jelenia Góra Valley, Kłodzko Valley, the Karkonosze, the Stołowe Mountains and the Śnieżnik Mountains.

The Lesser Poland Upland is poorly developed in terms of tourism. Its tourist values include interesting topography, national parks (Ojców National Park and Świętokrzyski National Park) as well as historical sites in Cracow and Częstochowa. The most tourist traffic focuses in three regions: the Kraków-Częstochowa Upland with interesting karst landscape, the Świętokrzyskie Mountains, Cracow and Wieliczka. The greatest attraction of the Masurian Lake District are lakes and forests. There are also anthropogenic attractions (Teutonic castles, open-air museums and museums). This region has well-developed accommodation facilities especially campsites. The most tourist traffic takes place in the summer. The main tourist areas are the Great Lakes District, the surroundings of Augustów, Ełk anf Wigry Lake.

The Coast is the region with the most tourist traffic in the summer season. It is a region of exceptional tourist and leisure values. There are sandy beaches, forests, coastal lakes (Łebsko, Jamno, Gardno). The coast has the most accommodation facilities including a large number of campsites. The anthropogenic attractions include the hisorical sites of Gdańsk, Szczecin, Kołobrzeg and Słupsk. The main aim of this article is to present the demographic factors affecting the development of cities and towns in a selected tourist region in Poland. Consequently, it is an attempt to determine the relationships between demographic and economic factors in local terms. The area to be studied was selected on the basis of delimitation within the administrative borders of the provinces. It was due to the way of aggregating statistical data by the Central Statistical Office (GUS) in Poland which are collected by admistrative units that are not always the same as the tourist regions. Ultimately, the analyzes were carried out for all cities of the Pomeranian Voivodeship.

## MATERIALS AND METHODS

In order to determine the area of research, an analysis of the budgets of communes and towns with county rights was conducted according to the Budget Classification System – category 630 Tourism. The data are collected by the Local Data Bank of the Central Statistical Office in Poland (www.stat.gov.pl). The analysed data are available in the statistics for the years 2008-2020 (Table 1). The selection of the area to analyse was made on the basis of the reported average annual income from tourism so as to avoid deviations from the trend to achieve that income. They were calculated as the arithmertic mean of the years 2008-2020. The communes in Pomerania have the highest average income from tourism among the 16 provinces in Poland. When different anuual periods are taken into account, Pomerania Province is always on the forefront of the regions which have the highest income from tourism. In the last few year (2018-2020), Lesser Poland Province had a bigger share and in the previous years West Pomerania Province, Warmia-Masuria Province and Łódź Province occasionaly had a bigger share. In the end, all analyses of the social and population changes took into account all the towns in Pomerania Province as one of the most profitable tourist regions in Poland (Table 1).

Table 1. Budget income of communes and towns with county rights in the category 630 Tourism in provinces in Poland in the years 2008-2020 (Data source: Public finances, GUS, Warszawa, www.stat.gov.pl, 30.09.2021, the author's own study)

| Administrative unit | Average income from tourism in the years 2008-2020 (PLN) | Share in the income from tourism in Poland in the years 2008-2020 (%) |
|---|---|---|
| POLAND | 203 721 440.66 | 100.00 |
| LOWER SILESIA PROVINCE | 19 318 617.24 | 9.48 |
| KUJAWY-POMERANIA PROVINCE | 4 215 504.73 | 2.07 |
| LUBLIN PROVINCE | 10 096 359.49 | 4.96 |
| LUBUSKIE PROVINCE | 8 269 221.38 | 4.06 |
| ŁÓDŹ PROVINCE | 18 933 871.66 | 9.29 |
| LESSER POLAND PROVINCE | 20 367 615.50 | 10.00 |
| MAZOVIA PROVINCE[ | 4 752 356.36 | 2.33 |
| OPOLE PROVINCE | 3 758 400.17 | 1.84 |
| SUBCARPATHIA PROVINCE | 8 751 214.29 | 4.30 |
| PODLASIE PROVINCE | 9 711 327.65 | 4.77 |
| POMERANIA PROVINCE | 29 880 891.23 | 14.67 |
| SILESIA PROVINCE | 11 626 898.84 | 5.71 |
| ŚWIĘTOKRZYSKIE PROVINCE | 8 724 765.82 | 4.28 |
| WARMIA-MASURIA PROVINCE | 18 271 173.66 | 8.97 |
| GREATER POLAND PROVINCE | 9 727 951.87 | 4.78 |
| WEST POMERANIA PROVINCE | 17 315 270.76 | 8.50 |

The Polish statistics, i.e. the Local Data Bank (BDL) of the Central Statistical Office (GUS) in Poland were the source of data for this research. The data analysed in the study concerned the demographic characteristics and economic data, finances of the territorial governments and the labour market. The analyses of the demographic and economic characteristics were conducted for the years 1995-2020. They were divided into two sub-periods due to comparability of data with economic variables: 1995-2005 and 2006-2020. The analysis of the demographic changes covered the whole period and, additionally, the two sub-periods which allowed to identify the pace of change. It is important due to the political situation of Poland as the first period of dynamic population changes is connected with Poland's accession into the European Union. The economic data in the first period under analysis (1995-2005) were incomplete and incomparable due to numerous changes in the reporting. The data were used for the analyses, however, it is necessary to remember that they were incomplete.

The inaccuracies of the statistics also relate to the current population states. It is a result of underestmating and overestimating the population states. This mainly results from the fact often pointed to by numerous researchers that some of the foreign and internal migrations were not registered (Sakson, 2001; Śleszyński, 2004; Michalski, 2014; Wiśniewski et al., 2020). 5 variables were applied to evaluate the demographic situation and changes:

- W-1 the rate of population growth/decline dynamics (% of the population growth/decline compared to the previous year);
- W-2 the average rate of population aging (number of inhabitants aged 65+ per 100 inhabitants under 14 years of age);
- W-3 the average feminisation rate for the population of marriage age (number of women per 100 men aged 25-44);
- W-4 the average rate of the population growth/decline (anual balance between live births and deaths per 1000 inhabitants);
- W-5 the average migration rate (annual balance of registered immigrants and emigrants in foreign and internal migrations per 1000 inhabitants).

The following 5 variables were applied to analyse the economic situation and changes:

- W-6 the rate of increase/decrease dynamics of the total commune's income per capita (% of the increase/decrease of income compared to the previous year);
- W-7 the average share of the commune's own income in the total budget;
- W-8 the average rate of economic entities (number of economic entities per 1000 inhabitants);
- W-9 the average share of investment spending in the commune's total spending;
- W-10 the average registered unemployment rate (number of registered unemployed people per 100 working-age population).

For the indicators W-6, W-7, W-9 and W-10 in urban-rural communes, the data were calculated for the whole commune due to lack of data for the town itself. Additionally, data from the years 2003-2020 were applied for indicator W-10 due to lack of comparable data from the previous period. Only two of the 10 variables mentioned above were defined as destimulants: the average indicator of population aging (W-2) and the average registered unemployment rate (W-10).

Then, the average level of the demographic and economic characteristics of the town was calculated. In order to compare the analysed variables, stimulating and normalizing transformations were conducted with the use of zero unitarization method which affects the sensitivity of primary data the least (Kukuła, 1999). The transformation of the diagnostic characteristics was reduced to a form where the volatility range is stable and equals 1. In this method, the distance between the variable from one of the ranges of variation is divided by the range which is the difference between the maximum and minimum value. This is a non-negative method and the calculating procedure is as follows (Młodak, 2006):

for stimulant: $\mathbf{Z}_{ij} = (x_{ij} - \min x_{ij}) / (\max x_{ij} - \min x_{ij})$;

for destimulant: $\mathbf{Z}_{ij} = (\max x_{ij} - x_{ij}) / (\max x_{ij} - \min x_{ij})$; where: $Z_{ij}$ – standardized value of characteristics $x_j$, $\min x_{ij}$ – minimum value of characteristics $x_j$, $\max x_{ij}$ – maximum value of characteristics $x_j$.

Furthermore, the correlation between the demographic variables and the economic development of the town was shown. To do that, the method of Pearson's correlation coefficient was applied.

## RESULTS AND DISCUSSION

### Characteristic of towns in Pomerania Province

Pomerania Province, one of the most attractive tourist regions in Poland, has unique natural values, coastal location and unique cultural heritage of the etnographic lands: Kaszuby, Kociewie, Krajna and Bory Tucholskie. In terms of economy, they are really varied regions. The tri-city agglomeration is an outstanding area and its core part the Tri-city accumulates the biggest part of the human and economic capital. The towns in the west of the province are not so much affected by its capital. They are different in terms of history which is more connected with the Slovincian culture and its specificity resulting from exchange of a large part of the population after World War II. In the south and west of the province, there

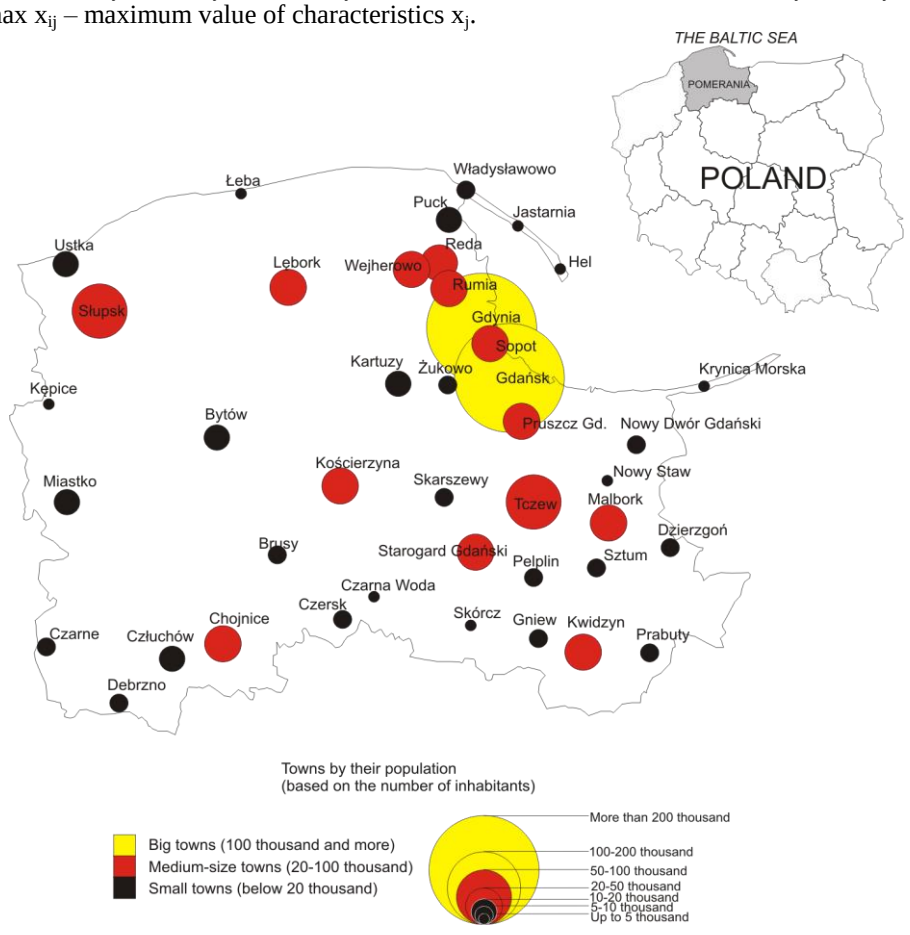


Figure 1. The towns of Pomerania Province according to their population in 2020
(Source: Population, BDL, GUS, www.stat.gov.pl, 30.09.2021, the author's own study)

are two large ethnic groups of Kashubian and Kociewie people who are the most closely connected with Pomerania region. The other towns are located on the coast and their roots and developmental trends are closely connected with marine economy and leisure tourism. Thus, the Pomeranian towns are characterized with great diversity in terms of their functions, which results in different behavioural models in the area of social and economic growth (Dutkowski, 2017).

As far as the size is concerned, there are only two towns with more than 100 thousand inhabitants: Gdynia and Gdańsk (Figure 1). 13 towns are medium-size towns with the population between 20 and 100 thousand. Most of the Pomeranian towns i.e., 27 are small towns with the population under 20 thousand. In terms of location, most of the towns are situated within the tri-city agglomeration and along the most important transport routes of Pomerania Province both roads and railways.

In Pomerania, 42 places are granted the town status (Table 2). Administratively, there are towns with county rights which function both as urban communes and county towns, urban communes and urban-rural communes. In 2020, 4 towns had the status of towns with county rights i.e., Gdańsk, Gdynia, Sopot and Słupsk. There were 18 towns with the status of urban communes and 20 towns in urban-rural communes.

Table 2. Admistrative status and Pomeranian towns' classification according to size in 2020.
(Data source: Administrative division, Population, BDL, GUS, Warszawa, www.stat.gov.pl, 30.09.2021, the author's own study)

| Administrative status | Small towns (up to 20 thousand inhabitants) | Medium-size towns (20-100 thousand inhabitants) | Big towns (over 100 thousand inhabitants) |
|---|---|---|---|
| Towns with county rights | - | Słupsk, Sopot (2) | Gdańsk, Gdynia (2) |
| Rural communes | Człuchów, Łeba, Krynica Morska, Hel, Puck, Ustka, Skórcz (7) | Chojnice, Pruszcz Gdański, Kościerzyna, Kwidzyn, Lębork, Malbork, Starogard Gdański, Tczew, Reda, Rumia, Wejherowo (11) | - |
| Towns in urban-rural communes | Bytów, Miastko, Brusy, Czersk, Czarne, Debrzno, Kartuzy, Żukowo, Prabuty, Dzierzgoń, Nowy Staw, Sztum, Nowy Dwór Gdański, Jastarnia, Władysławowo, Kępice, Czarna Woda, Skarszewy, Gniew, Pelplin (20) | - | - |

**Demographic changes in towns of Pomerania in Poland**

The demographic changes in Poland at the begining of the 1990s are connected with political and economic changes. In this period, birth rate dramatically declined (Kurek, 2008). The population growth slowed down. A similar situation took place in the towns of Pomerania Province although the depopulation changes were rather slow in this region.

The population of Pomerania Province in the years 1995-2020 did not change significantly but tended to grow compared to the population in Poland (Table 3). However, it increased in the rural areas compared to medium-size and small towns, which is the result of suburbanization processes taking place in Ponad (Wiśniewski et al., 2020).

Table 3. The population of Poland and Pomerania Province in the years 1995-2020 (Data source: Population, BDL, GUS, Warszawa, www.stat.gov.pl, 30.09.2021, the author's own study)

| **Administrative unit** | **Population (in thousands)** | | **Change (%)** |
|---|---|---|---|
| | **1995** | **2020** | **1995-2020** |
| **TOTAL** | | | |
| Poland | 38 639.34 | 38 265.01 | -0.89 |
| Pomerania Province | 2 165.68 | 2 346.67 | +8.36 |
| **TOWNS** | | | |
| Poland | 23 876.67 | 22 905.09 | -4.07 |
| Pomerania Province | 1 496.12 | 1 482.78 | -0.89 |
| **RURAL AREAS** | | | |
| Poland | 14 732.73 | 15 359.92 | +4.26 |
| Pomerania Province | 669.56 | 863.89 | +29.02 |

Table 4. Average annual rate of population change in the towns of Pomerania Province in the years 1995- 2020 (Data source: Population, BDL, GUS, Warszawa, www.stat.gov.pl, 30.09.2021, the author's own study)

| Average annual rate of population change (%) | Small towns (up to 20 thousand inhabitants) | Medium-size towns (20-100 thousand inhabitants) | Big towns (over 100 thousand inhabitants) |
|---|---|---|---|
| **1995-2005** | | | |
| from -1.81 to -1.01 | 2 | 0 | 0 |
| from – 1.00 to 0.00 | 14 | 10 | 1 |
| from 0.00 to +1.00 | 8 | 1 | 1 |
| from +1.01 to +1.98 | 3 | 2 | 0 |
| **2006-2020** | | | |
| from -2.41 to -1.01 | 3 | 0 | 0 |
| from – 1.00 to 0.00 | 17 | 6 | 1 |
| from 0.00 to +1.00 | 7 | 5 | 1 |
| from +1.01 to 2.54 | 0 | 2 | 0 |
| **1995-2020** | | | |
| from -1.54 to -1.01 | 3 | 0 | 0 |
| from – 1.00 to 0.00 | 16 | 8 | 1 |
| from 0.00 to +1.00 | 7 | 3 | 1 |
| from +1.01 to 2.31 | 1 | 2 | 0 |

In individual towns of that region, the average annual rate of population growth/decline was from -1.54 to +2.31 in the years 1995-2020 (Table 4). The most favourable changes occured in the towns near Tri-city, in medium-size and small towns i.e., Rumia, Pruszcz Gdański, Wejherowo, Żukowo which grow naturally as a result of the suburbanization processes. Unfortunately, a majority of the towns of Pomerania Province lose their population resources including the coastal towns like Ustka, Łeba, Władysławowo, Jastarnia and Hel. Depopulation is increasing in each decade which is confirmed by the extreme values of the average rate of population decline. In the years 1995-2005, two small towns (Hel and Kępice) were in the first range of the highest decline with an average annual decline -1.81% and -1.04 % respectively. In the years 2006-2020, there were three towns with a much higher average population decline (Hel: -1.36%, Jastarnia: – 2.41% oraz Władysławowo: -2.18%).

Depopulation of the Pomeranian towns is accompanied by constant increase of the average population aging rate (Table 5.). Sopot reported the highest rate of population aging of all the Pomeranian towns. During the whole period under research, the population aging rate in Sopot increased 2.5 times. At present, there are more than 258 people aged 65 and

older per 100 people aged 0-14. Sopot does not offer many new houses due to its limited possibilities of urban development as it is situated between Gdańsk and Gdynia. Young people and promising families would definitely be interested in new housing opportunities though. Unfortunately, lack of opportunities in this area results in the significant decrease of the population age. The aging rate of the Sopot population is one of the lowest. In many other towns, the increase of the average rate of population growth is much less favourable. In small towns like Ustka, Człuchów and Miastko the share of older population increased fivefold and in Hel even tenfold. In general, all the towns recorded an increase of the average population aging rate. Moreover, the number of towns with the highest population aging rate increased from 1 to 14.

Table 5. Average rate of demographic aging in the towns of Pomerania Province in the years 1995- 2020
(Data source: Population, BDL, GUS, Warszawa, www.stat.gov.pl, 30.09.2021, the author's own study)

| Average rate of demographic aging (%) | Small towns (up to 20 thousand inhabitants) | Medium-size towns (20-100 thousand inhabitants) | Big towns (over 100 thousand inhabitants) |
|---|---|---|---|
| **1995-2005** | | | |
| from 22.88 to 50.00 | 18 | 6 | 0 |
| from 50.01 to 100.00 | 10 | 6 | 2 |
| from 100.01 to 146.89 | 0 | 1 | 0 |
| **2006-2020** | | | |
| from 43.24 to 50.00 | 0 | 1 | 0 |
| from 50.01 to 100.00 | 18 | 9 | 0 |
| from 100.01 to 227.35 | 9 | 3 | 2 |
| **1995-2020** | | | |
| from 34.63 to 50.00 | 3 | 1 | 0 |
| from 50.01 to 100.00 | 23 | 11 | 2 |
| from 100.01 to 108.61 | 1 | 1 | 0 |

The average feminisation rate of marriage age[1] population is an important indicator of procreational and growth possibilities of territorial units. If there is a big disproportion between the sexes, it is likely to disrupt the lifecycle, especially in terms of starting families and procreation. In the small towns of Pomerania Province in Poland, certain disproportions are observed (Table 6). In the big towns, the number of men of childbearing age (25-44) was slightly higher than the number of women. Although this disproportion was bigger at the beginning of the research period, in 1999-2010 the proportions became more equal and then a systhematic decline of the share of women in this age category occured. Overall, the feminisation indicator in this population group increased in the period under study in small towns, which resulted in favourable changes and equalization of proportions between the sexes. In this group of towns, only Pruszcz reported a decrease in the average share of marriage age women compared to men of the same age. Starogard Gdański, on the contrary, recorded an increase of the feminisation rate from 97.70 in 1995 to 109.96 in 2020. In small towns the feminisation rate tends to increase, which is clearly visible in the period of 2006-2020. Provided that this rate does not rise significantly, the current situation should be considered as normal. However, leaving small towns by men of marriage age is a serious threat to those towns from future point of view. The biggest disproportions, and hence the fastest increase of that rate, are observed in a few small towns i.e., Hel, Miastko, Pelplin and Czarna Woda.

Table 6. Average rate of feminisation of marriage age people in the towns of Pomerania Province in the years 1995- 2020
(Data source: Population, BDL, GUS, Warszawa, www.stat.gov.pl, 30.09.2021, the author's own study)

| Average rate of feminisation of marriage age people | Small towns (up to 20 thousand inhabitants) | Medium-size towns (20-100 thousand inhabitants) | Big towns (over 100 thousand inhabitants) |
|---|---|---|---|
| **1995-2005** | | | |
| from 91.73 to 100.00 | 18 | 12 | 2 |
| from 100.01 to 105.00 | 5 | 1 | 0 |
| from 105.01 to 114.75 | 4 | 0 | 0 |
| **2006-2020** | | | |
| from 94.11 to 100.00 | 6 | 6 | 2 |
| from 100.01 to 105.00 | 16 | 6 | 0 |
| from 105.01 to 116.48 | 5 | 1 | 0 |
| **1995-2020** | | | |
| from 95.01 to 100.00 | 10 | 12 | 2 |
| from 100.01 to 105.00 | 13 | 1 | 0 |
| from 105.01 to 115.75 | 4 | 0 | 0 |

Natural birth rate is one of the elements of the demographic transition creating population growth and structure according to age. The towns of the tri-city agglomeration recorded population decline in the whole period under research, which is characteristic for depopulating Polish towns (Table 7). Positive fluctuations and increase of the natural birth rate was observed in Gdańsk in the last 14 years. This is the result of migration of young people to the Province capital initially to continue their education and then to seek employment and settle down in a big and growing town. Overall, the best birth rates were recorded in the growing tri-city agglomeration both in small and medium-size towns such as Pruszcz Gdański, Żukowo, Władysławowo, Rumia, Reda, Wejherowo. Some of the Kashubian towns seem specific in this respect as they had

[1] After Wiśniewski R. et al. (2020) the marriage age was corrected from the usually applied age of 19-33 due to a constant trend observed in Poland for many years now getting married at an older age and a bigger share of second marriages. This proces is convergent with West European trends where the average age of the newlyweds is still 4 years older and similar to the age 25-44 applied in the study.

significantly higher rates (Bytów, Brusy, Debrzno, Kościerzyna). The worst situation in this respect occured in coastal towns and western part of the province where, on average, population decline was observed (Łeba, Jastarnia, Puck, Ustka, Kępice).

Migration balance is another factor next to birth rate which directly affects population numbers. General trends in Poland are not favorable (Demograpic situation in Poland..., 2021). The situation is similar in Pomerania Province (Table 8). Towns with positive migration balance are situated within the tri-city agglomeration: Pruszcz Gdański, Reda, Rumia, Żukowo. The other towns, both medium-size and small ones, experienced large population decline. It was caused by resettlements to suburban areas and leaving for big cities especially in the case of young people.

Table 7. Average rate of population growth/decline in the towns of Pomerania Province in the years 1995- 2020 (Data source: Population, BDL, GUS, Warszawa, www.stat.gov.pl, 30.09.2021, the author's own study)

| Average rate of population growth/decline (‰) | Small towns (up to 20 thousand inhabitants) | Medium-size towns (20-100 thousand inhabitants) | Big towns (over 100 thousand inhabitants) |
|---|---|---|---|
| **1995-2005** | | | |
| from -5.61 to 0.00 | 1 | 1 | 2 |
| from 0.01 to 5.00 | 22 | 11 | 0 |
| from 5.01 to 7.88 | 4 | 1 | 0 |
| **2006-2020** | | | |
| from -5.52 to 0.00 | 16 | 3 | 1 |
| from 0.01 to 5.00 | 9 | 8 | 1 |
| from 5.01 to 9.11 | 2 | 2 | 0 |
| **1995-2020** | | | |
| from -5.56 to 0.00 | 7 | 3 | 2 |
| from 0.01 to 5.00 | 19 | 9 | 0 |
| from 5.01 to 7.84 | 2 | 1 | 0 |

Table 8. Average level of migration balance in the towns of Pomerania Province in the years 1995- 2020 (Data source: Population, BDL, GUS, Warszawa, www.stat.gov.pl, 30.09.2021; the author's own study) * There are no data concerning foreign migration for Polish communes available for 2015. Internal migration balance was used to calculate the migration balance for this year

| Average level of migration balance (‰) | Small towns (up to 20 thousand inhabitants) | Medium-size towns (20-100 thousand inhabitants) | Big towns (over 100 thousand inhabitants) |
|---|---|---|---|
| **1995-2005** | | | |
| od -13.45 do -5.00 | 6 | 0 | 0 |
| od -5.01 do 0.00 | 13 | 7 | 1 |
| od 0.01 do 10.59 | 8 | 6 | 1 |
| **2006-2020** | | | |
| od -18.05 do -5.00 | 9 | 0 | 0 |
| od -5.01 do 0.00 | 17 | 9 | 1 |
| od 0.01 do 14.63 | 1 | 4 | 1 |
| **1995-2020** | | | |
| od -16.11 do -5.00 | 5 | 0 | 0 |
| od -5.01 do 0.00 | 19 | 10 | 1 |
| od 0.01 do 12.92 | 3 | 3 | 1 |

Table 9. Average dynamics of total commune's income growth in the towns of Pomerania Province in the years 1995- 2020 (Data source: Public finances, BDL, GUS, Warszawa, www.stat.gov.pl, 27.05.2022; the author's own study)

| Average dynamics of total commune's income per capita (%) | Small towns (up to 20 thousand inhabitants) | Medium-size towns (20-100 thousand inhabitants) | Big towns (over 100 thousand inhabitants) |
|---|---|---|---|
| **1995-2005** | | | |
| from 10.46 to 15.00 | 10 | 6 | 2 |
| from 15.01 to 20.00 | 10 | 7 | 0 |
| from 20.01 to 28.96 | 7 | 0 | 0 |
| **2006-2020** | | | |
| from 6.81 to 15.00 | 25 | 13 | 2 |
| from 15.01 to 20.00 | 1 | 0 | 0 |
| from 20.01 to 20.25 | 1 | 0 | 0 |
| **1995-2020** | | | |
| from 8.57 to 15.00 | 23 | 13 | 2 |
| from 15.01 to 20.00 | 3 | 0 | 0 |
| from 20.01 to 23.73 | 1 | 0 | 0 |

**Economic changes in Pomeranian towns in Poland**

Local economic changes leading to the development of communes and towns are an individual issue. According to Wiśniewski et al. (2020), the following factors are significant: interaction between residents, spatial accessibility, natural conditions, and factors connected to the local specificity, e.g. the presence of the local leader. The study analyses the commune's income (W-6, W-7), intensity of economic activity (W-8), investment spending (W-9) and the unemployment rate as a factor destabilizing local development (W-10). The average commune's income growth rate per capita decreased in the years 1995-2020 (Table 9). Although a majority of towns in Pomerania recorded income growth by 15-20% in the years 1995-2005, the income growth dynamics decreased to less than 15% in the next period under study. Krynica Morska

recorded the highest commune's income growth per capita. It is one of the smallest towns in Poland. It is located in the Vistula Spit and surrounded by the Baltic Sea (Gdańsk Bay) from the north and the Vistula Lagoon from the south. There are great conditions for leisure tourism thanks to large areas of pine and beech forest. In terms of economy, the town is focused on the development of tourism. The town's aim is to be granted the health resort status due to the curative properties of the climate and mineral water resources. Communes' own income tells us about potential finacial independence of the territorial government units and measure their potential growth possibilities (Table 10). The lowest share of own income in the commune's total income was reported in Brusy while the highest one in Krynica Morska. Krynica Morska was described above and its enterprising character focused on tourism development was confirmed. Brusy belongs to the group of small towns. It is located in the Tuchola Forest in the Kashubia ethnic region. In terms of tourism, the town promotes Kashubian culture and the natural values of the region. The surroundings are characterized by numerous natural conservation zones. The town is focused on multifunctional growth and acquiring capital for tourism development. The town's deveopment is also connected with agriculture. However, it struggles with the problems of unemployment and tourism development requires significant investment. Overall, small and medium-size towns are the most financially independent.

Table 10. Average share of the commune's own income in total income in the towns of Pomerania Province in the years 1995- 2020 (Data source: Public finances, BDL, GUS, Warszawa, www.stat.gov.pl, 27.05.2022; the author's own study)

| Average share of the commune's own income in total revenue (%) | Small towns (up to 20 thousand inhabitants) | Medium-size towns (20-100 thousand inhabitants) | Big towns (over 100 thousand inhabitants) |
|---|---|---|---|
| **1995-2005** | | | |
| from 25.39 to 40.00 | 13 | 0 | 0 |
| from 40.01 to 60.00 | 11 | 13 | 2 |
| from 60.01 to 72.48 | 3 | 0 | 0 |
| **2006-2020** | | | |
| from 25.37 to 40.00 | 10 | 0 | 0 |
| from 40.01 to 60.00 | 11 | 10 | 0 |
| from 60.01 to 77.79 | 6 | 3 | 2 |
| **1995-2020** | | | |
| from 25.69 to 40.00 | 12 | 0 | 0 |
| from 40.01 to 60.00 | 9 | 10 | 1 |
| from 60.01 to 75.54 | 6 | 3 | 1 |

Economic activity is reflected in the opportunities to create economic entities that bring real financial benefits for the town's economy. The bigger number of economic entities, the better working conditions for the local population. The average level of entrepreneurship in Pomeranian towns tends to increase (Table 11). This is particularly visible in small and medium-size towns where the value of this indicator rose significatly in the last 15 years. The highest economic activity was reported in the small coastal towns: Łeba, Jastarnia, Władysławowo, Krynica Morska. In those towns, the number of economic entities is connected with the development of tourism. The worst conditions were observed in the towns of west and south Pomerania. Property expenditures, especially investment spending, are a measure of economic activity. This indicator tells us whether the local authorities invest a part of their own income or rather spend it on current expenses (Table 12). Resilience of local authorities is rather varied in the towns of Pomerania Proivince. Definitely, the fastest pace of investment implementation is reported in the following towns: Łeba, Jastarnia, Krynica Morska and Pruszcz Gdański. This confirms the engagement of their authorities in the develpment of those towns. On the other hand, there are several towns with the lowest investment level. They are towns located in the south of the province: Prabuty, Czarna Woda, Skarszewy and Gniew. Słupsk and Kwidzyn are characterized with stagnation in the whole period under study.

Table 11. Averag rate of economic entities per 1000 inhabitants in the towns of Pomerania Province in the years 1995- 2020 (Data source: National economic entities registered in REGON, BDL, GUS, Warszawa, www.stat.gov.pl, 27.05.2022; the author's own study)

| Averag rate of economic entities per 1000 inhabitants | Small towns (up to 20 thousand inhabitants) | Medium-size towns (20-100 thousand inhabitants) | Big towns (over 100 thousand inhabitants) |
|---|---|---|---|
| **1995-2005** | | | |
| from 46.88 to 100.00 | 20 | 9 | 0 |
| from 100.01 to 200.00 | 3 | 4 | 2 |
| from 200.01 to 336.79 | 4 | 0 | 0 |
| **2006-2020** | | | |
| from 80.70 to 100.00 | 10 | 2 | 0 |
| from 100.01 to 200.00 | 13 | 10 | 2 |
| from 200.01 to 359.31 | 4 | 1 | 0 |
| **1995-2020** | | | |
| from 66.39 to 100.00 | 15 | 5 | 0 |
| from 100.01 to 200.00 | 8 | 8 | 2 |
| from 200.01 to 345.07 | 4 | 0 | 0 |

Unemployment as a constant phenomenon on the labour market is justified at a certain level and even desired in the relationships between labour supply and demand. However, exceeding that level results in social and economic turbulance and crises. Depopulation, demographic structure and migration processes may significantly affect the unemployment rate (Gołata, 2002; Szukalski, 2015; Guzikowski, 2016). The average unemployment rate tends to decrease. At the beginning of the XXth century, its average rate in most small towns was 20-25% and in medium-size towns 10-15%. However, it

improved in the last few years and in 2020 the unemployment rate did not exceed 9.5%. Definitely, the best opportunities to find jobs are in the big towns and in towns situated within the tri-city agglomeration (Table 13). The small towns, especially those located in the south and west Pomerania struggle periodically to equalize labor demand and supply.

Table 12. Average share of property investment spending in total spending in the towns of Pomerania Province in the years 1995- 2020 (Data source: Public finances, BDL, GUS, Warszawa, www.stat.gov.pl, 27.05.2022; the author's own study)

| Average share of property investment spending in total spending (%) | Small towns (up to 20 thousand inhabitants) | Medium-size towns (20-100 thousand inhabitants) | Big towns (over 100 thousand inhabitants) |
|---|---|---|---|
| **1995-2005** | | | |
| from 8.65 to 15.00 | 8 | 3 | 0 |
| from 15.01 to 20.00 | 7 | 5 | 2 |
| from 20.01 to 33.07 | 12 | 5 | 0 |
| **2006-2020** | | | |
| from 9.39 to 15.00 | 9 | 3 | 0 |
| from 15.01 to 20.00 | 11 | 7 | 1 |
| from 20.01 to 34.25 | 7 | 3 | 1 |
| **1995-2020** | | | |
| from 9.47 to 15.00 | 7 | 2 | 0 |
| from 15.01 to 20.00 | 11 | 8 | 1 |
| from 20.01 to 31.42 | 9 | 3 | 1 |

Table 13. Average unemployment rate in the towns of Pomerania Province in the years 1995- 2020 (Data source: Labour market, BDL, GUS, Warszawa, www.stat.gov.pl, 27.05.2022; the author's own study)

| Average share of investment spending in total spending (%) | Small towns (up to 20 thousand inhabitants) | Medium-size towns (20-100 thousand inhabitants) | Big towns (over 100 thousand inhabitants) |
|---|---|---|---|
| **1995-2005** | | | |
| from 5.70 to 10.00 | 2 | 4 | 2 |
| from 10.01 to 20.00 | 13 | 9 | 0 |
| from 20.01 to 25.50 | 12 | 0 | 0 |
| **2006-2020** | | | |
| from 2.60 to 5.00 | 2 | 4 | 2 |
| from 5.01 to 10.00 | 15 | 9 | 0 |
| from 10.01 to 14.70 | 10 | 0 | 0 |
| **1995-2020** | | | |
| from 3.10 to 5.00 | 1 | 3 | 2 |
| from 5.01 to 10.00 | 12 | 10 | 0 |
| from 10.01 to 16.50 | 14 | 0 | 0 |

**Correlation of demographic aspects with the development of towns in Pomerania Province in Poland**

Determining the cause and effect relationships of the demographic changes and the local development is not easy. Studying different elements of those phenomena leads to various conclusions (Wiśniewski et al., 2020). Referring to the Pomeranian towns in general, the average demographic growth is the most favourable in the first urbanized zone of the tri-city agglomeration (Figure 2). The zone includes small and medium-size towns whose development occurs along Gdańsk Bay due to their location. The suburbanization processes encourage young people to settle down in the Tri-city surroundings with good transportation to the places of work and education. The lowest rate of demographic growth including depopulation occurs mostly in the towns located on the coast and the west of the province. Sopot compares negatively in terms of the demographic aging rate and depopulation. The town is struggling with serious demographic problems and lack of spatial growth possibilities. The situation of the towns under study is different in terms of the economic growth (Figure 3). The coastal towns such as Łeba, Jastarnia and Krynica Morska have the highest economic growth rate as well as demographically stable Sopot or demographically growing Pruszcz Gdański. The towns in the south and west part of the province are not so resilient in terms of economy.

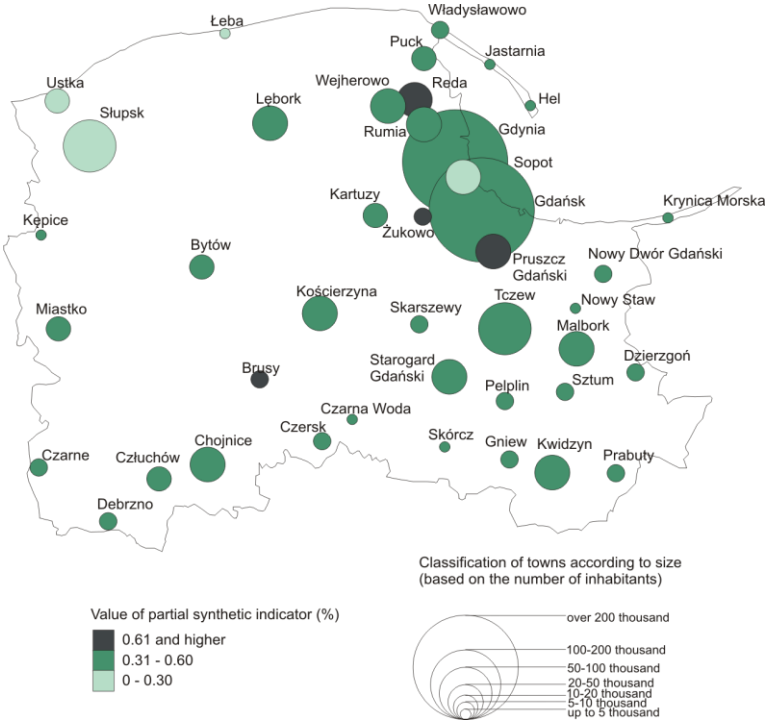


Figure 2. Average rate of population growth of the towns in Pomerania Province in 1995-2020 (Source: the author's own study)

In order to determine the correlations of demographic characteristics with economic growth of Pomeranian towns, Pearson's correlation coefficient was calculated. It is assumed that the correlation value from 0 to 0.3 means weak correlation, from 0.3 to 0.5 moderately strong correlation and the value from 0.5 to 1 points to a very strong correlation of the characteristics under analysis. Overall, Pearson's correlation coefficient calculated for the average level of all the demograhic characteristics together and the economic characteristics together amounted to -0.2, which suggests a weak negative correlation between the characteristics under research (Table 14). Among the demographic characteristics under analysis, the relatively strongest negative correlation was observed for indicator W-2 (population aging indicator) and W-3 (feminisation of marriage age population indicator). That means that a decrease in one of the indicators might decide about the economic growth and vice versa. The analysis of partial correlation in the category of the towns' size shows that medium-size towns have a moderate positive correlation with migration balance (W-5). A higher migration balance could significantly improve the economic situation of those towns.

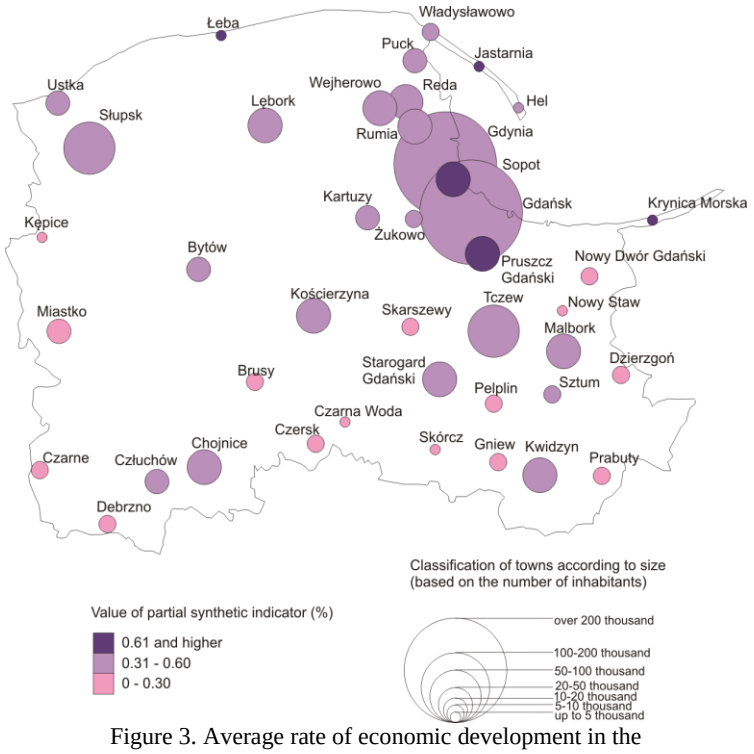


Figure 3. Average rate of economic development in the towns in Pomerania Province in 1995-2020 (Source: the author's own study)

Also, the correlation between the feminisation rate (W-3) in medium-size towns tends to grow in a negative direction. The population structure according to sex, especially its procreative part i.e., the working age population may significantly impact the character of economic changes. Pearson's correlation coefficient in big towns tends to assume extreme values of a strong correlation, but it was measured for two towns only, which significantly decreases its interpretational value.

Table 14. Correlation of demographic characteristics with the economic development of Pomerania Province towns in the years 1995-2020 (Data source: the author's own study)

| Pearson's correlation coefficient | Small towns (up to 20 thousand inhabitants) | Medium-size towns (20-100 thousand inhabitants) | Big towns (over 100 thousand inhabitants) | Total towns |
|---|---|---|---|---|
| | **Together W-6 – W-10** | | | |
| W-1 | -0.32866 | 0.29298 | 1.00 | -0.07697 |
| W-2 | -0.32694 | -0.13744 | -1.00 | -0.24514 |
| W-3 | -0.16747 | -0.50477 | -1.00 | -0.27153 |
| W-4 | -0.10631 | -0.20633 | 1.00 | -0.13747 |
| W-5 | 0.00366 | 0.40824 | 1.00 | 0.17427 |
| **W-1 – W-5** | **-0.34616** | **0.01483** | **1.00** | **-0.20023** |

## CONCLUSION

Conducting research on the cause and effect relationships between the demographic changes and the local development is not an easy task. Difficulties occur due to the spatial scale of the units under study and the local specificity of the settlement units. The specificity may result from historical, environmental and even etnographic conditions.

The analysis of the demographic characteristics in Pomerania, one of the most profitable tourist regions in Poland, shows their internal heterogeneity and the impact of local factors including the size of the towns, their spatial location and cultural conditions. Positive demographic trends such as population growth, relatively positive birth rate and migration balance are observed in small and medium-size towns located within the tri-city agglomeration. Kashubian towns of the middle and south Pomerania report quite good birth rate. Unfortunately, the other elements of demographic changes, especially migration processes, are not so optimistic. The coastal towns and Sopot report the biggest population decline.

Economic development measured by the local governements' income, their entrepreneurship and labour market supply also indicated relatively good conditions for the development of towns located within the impact zone of the tri-city agglomeration. Additionally, above-average level of development is observed in those tourist towns on the coast which did not report population growth. The towns in the south of Pomerania Province have the lowest average rate of economic development, which does not translate into economic activity despite good demographic situation. The towns located in the west of the province deprived of the impact of the agglomeration and not showing economic resilience remain in the worst situation. In view of the above considerations, the correlations between demographic changes and economic development are conditioned by geographic location, existence of growth engines such as a large nearby city (agglomeration impact), unique natural environment characteristics (tourist value of the coastal towns) and cultural conditions (procreative ethnic characteristics of the Kashubian people) rather than an existing or non-existent demographic trend. The above is confirmed by the Pearson's correlation coefficients which point to rather low dependence of demography and economic development.

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