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## **DEPOPULATION IN PERIPHERAL REGIONS OF EASTERN POLAND – DETERMINANTS AND CONSEQUENCES**

Key words: rural areas, peripheral regions, Eastern Poland Macroregion, NUTS-2, depopulation

**ABSTRACT.** The study examines demographic processes and the resulting challenges for the development of areas at risk of depopulation. The research covered regions defined as NUTS 2 in European Union nomenclature and classified as the Eastern Poland Macroregion in Polish regional policy. This macroregion is counted among the peripheral regions of Poland. The demographic processes taking place within these regions, and especially in many local administrative units (LAU 2), point to a threat of depopulation. The scope of the detailed study is from 2010 to 2020. Descriptive, tabular and graphical methods, as well as demographic projections until 2040 were used to analyse and present the materials for the analysed provinces. It was found that unfavourable demographic processes are intensifying and pose a threat to socio-economic development, especially for the peripheral rural communes of these regions. Progressing decline in fertility, increasing life expectancy, as well as intensified migration processes lead to unfavourable changes in the population structure, and, in the long run, to depopulation, which will undoubtedly multiply economic and social problems in these regions.

## **INTRODUCTION**

The statement that human beings play a key role in socio-economic development can be considered a truism. However, this does not change the fact that considerations and actions related to socio-economic development should always focus on the proper identification and use of human potential. This applies to the creation and implementation of specific development concepts, but also to the use of the results of such activities. Hence, in development processes, the human factor, which is the basic, endogenous factor of development of any territorial unit [Ślusarz 2005], should be perceived and considered through broadly understood demography that is closely related to a specific

territory. It follows from the essence of demography that it deals with the observation, analysis and forecasting of population processes, the study of interrelationships of demographic events and the interaction of demographic phenomena and the conditions of human existence [Kędelski, Paradysz 2006]. Demography, understood in this way, is closely related to a specific place or territory. It is the foundation of the socio-economic development of individual countries and their constituent territorial units. The considerable spatial differentiation of territorial units significantly affects demographic processes and the demographic potential located within their territory. The demographic potential of individual territorial units, on the one hand, is the basis for the formation of socio-economic processes on their territory (is a factor of development) and, at the same time, is a specific reflection of these processes (the level of socio-economic development in a given territory may stimulate or inhibit demographic processes). There is a kind of feedback loop between this potential and the level of socio-economic development [Ślusarz 2016, 2017].

The main quantitative changes in the state and structure of the population are due to natural and migratory movements [Mrkić et al. 2014]. At the current stage of development, one of the biggest demographic challenges that Poland, as well as other European countries, is facing is the issue resulting from rapid population ageing. Major causes of population ageing include declining fertility and increased life expectancy [Okólski, Tucholska 2010]. In many regions, this is compounded by migration processes that increase the danger of depopulation.

The most common causes of migration, in addition to political, social and cultural aspects, are economic and demographic factors, such as poverty, unemployment, low wages, high birth rates, lack of medical care and deficiencies in the education system [Miłaszewicz, Siedlikowski 2016].

Among the areas most threatened by the effects of adverse demographic processes are peripheral and less economically developed regions and, in particular, the rural areas of such regions. Peripherality is a complex phenomenon. Hence, the concept of peripherality is ambiguous and has not yet received a clear definition. Many definitions of peripheral regions or areas can be found in geographical, social, and economic sciences [EC 1997, Copus, Skuras 2006, Grosse 2007, Komornicki, Śleszyński 2009, Mischuk 2010, 2013, Wójcik 2011, Idczak 2013, Guzal-Dec 2015]. Without going into detail, it is possible to list the most important features of these definitions, indicating the peripherality of territorial units, such as:

- remoteness from centres of socio-economic and political-administrative life and limited communication accessibility,
- low levels and low rates of development, low wage levels,
- an underdeveloped social and technical infrastructure,
- a high degree of poverty and social exclusion,
- high dependence on the transfer of state aid and external investment funds (from central regions),

- low population density, an unfavourable age structure of the population with a high share of elderly people, intensified migration processes accompanying the depopulation of such areas, and all this leads to a deterioration of human capital,
- a high unemployment rate and, in the case of rural areas, additionally high hidden unemployment and the domination of small and economically weak farms,
- the specificity of the geographical environment resulting, for example, from being located in mountainous and foothill areas, or in border regions lagging behind in development.

All of the above mentioned peripherality characteristics occur, to a greater or lesser extent, in the area covered by the study, i.e. in regions included in the Eastern Poland Macroregion, composed of the following provinces: Lublin, Podlasie, Subcarpathia, Holy Cross (Świętokrzyskie) and Warmia-Masuria. The aim of the study is to evaluate demographic processes and the resulting challenges for the development of areas at risk of depopulation in the Macroregion formed by provinces with dominant peripherality characteristics.

## MATERIALS AND METHODS

Part of the results of a broader study on demographic processes in peripheral regions threatened by depopulation are presented. Regions defined as NUTS 2 in EU nomenclature [Regulation (EC) No 1059/2003] were adopted as basic empirical units. In the Polish administrative structure, these correspond to provinces. In part of the research, results are presented for communes corresponding to Local Administrative Units (LAU 2) in current EU nomenclature [Eurostat 2003], and formerly NUTS 5 units. The spatial scope of research covers regions (provinces) included in the Eastern Poland Macroregion in Polish regional policy. This scope was not only selected on the basis of geographical but also economic criteria, because it consists of regions with the lowest GDP *per capita*, mainly located in south-eastern Poland. This Macroregion was covered by the Operational Programme Eastern Poland 2014-2020 (OP EP), which was an instrument to support socio-economic development for least developed areas. It consists of 5 out of 16 Polish provinces: Lublin, Podlasie, Subcarpathia, Holy Cross and Warmia-Masuria. Those regions are far from large metropolitan areas – the leading growth poles in the country. They have a low GDP *per capita*, are less populated and less urbanised, and a large part of their area is occupied by border areas (except for the Holy Cross Province). It should be added that the Macroregion includes 1,399 km of the state border, which constitutes 45.6% of the total length of the Polish land border. However, another important thing is that the internal EU border is only 238 km long (104 km with Lithuania and 134 km with Slovakia), and the remaining 83.0% of it is an external EU border (418 km with Belarus,

208.3 km with the Kaliningrad Oblast, Russia and 535 km with the Ukraine). This poses significant constraints on taking advantage of the border location to boost socio-economic development, as is the case, for example, in cooperation between border regions in France, Germany and Switzerland [Walther, Reitel 2013].

In addition, in the Subcarpathia and Holy Cross Provinces there are mountain and foothill areas, characterised by the presence of large areas of valuable nature, covered by various forms of nature protection measures. This creates many constraints to achieving development goals, especially in the economic sphere. In practice, the development of the economic function in environmentally valuable areas is connected with the challenging need to ensure the economic effectiveness of activity with the simultaneous provision of public goods, such as the preservation of natural and landscape values [Ślusarz 2018]. This is not conducive to the acceleration of socio-economic development processes.

These features, among others, are the reason why these regions are classified as peripheral regions of Poland. The demographic processes taking place within these regions, and especially in many local units, point to a threat of depopulation. These regions cover 31.7% of the land area of Poland and are home to 20.9% of the country's population. The time scope of the detailed study is from 2010 to 2020. The report presents selected indicators characteristic of the regions covered by the research, enabling an assessment of the researched processes. Economic growth, which determines the development of the economy, as measured by GDP, is a prerequisite for socio-economic development. Therefore, the study presents selected indicators reflecting demographic processes in the studied regions against GDP *per capita*, entrepreneurship saturation (number of SMEs per 1,000 inhabitants) and the unemployment rate. The following indicators were used in the analysis: the population and its dynamics during the research period, the population density (persons per 1 km<sup>2</sup>), the average growth/decline rate for 2020 (%), the demographic structure – status and projections, the overall permanent migration balance and population density in communes (local administrative units – LAU 2). Descriptive, tabular, and graphical methods were used to analyse and present the materials. Literature on the subject was used, as well as data taken from the statistical offices of the regions covered by the study (including demographic projections until 2040) and from the Local Data Bank.

## RESULTS

Unfavourable demographic processes, especially those related to depopulation, are becoming the greatest threat to socio-economic development. Depopulation leads to an increasing imbalance of various socio-economic structures, translates into a lower attractiveness of the region as a place to live and locate economic activities. The consequences of the above include multifaceted social and economic impacts in both

micro- and macroeconomic terms, leading to the marginalisation of individuals and entire territorial units. The main reason for growing depopulation processes in these regions is the declining birth rate and migration, closely linked to socio-economic development, of which economic growth is an indispensable condition. When assessing the examined regions in terms of GDP *per capita* as a measure of such growth (Table 1), it should be emphasised that they are far behind, not only in relation to regions with the highest level of this indicator, but also in relation to the national average.

In terms of GDP *per capita*, the highest place in the examined group was taken by the Holy Cross Province, with GDP at 72.3% of the national average. The Lublin Province, last on the list, only achieved 67.8% of the average. It should be stressed that this situation has persisted for many years. There was only a slight reshuffling at the bottom of the ranking.

As regards poorly urbanised areas, which include Eastern Poland Macroregion provinces, where the urbanisation indicator (with the exception of the Podlaskie Province) is below the national average (Table 1), the key role in economic development is played by the SME sector, and, in particular, by micro and small enterprises. In 2018, micro and small enterprises accounted for 99% of all companies in Poland [GUS 2019] and generated nearly 40% of the Gross Domestic Product (GDP), while all enterprises in Poland generated 74% of the GDP [PARiP 2019]. They not only provide jobs for their owners, but also create jobs in local markets. Unfortunately, in the studied regions, the saturation of enterprises included in the SME sector significantly deviates from the Polish average, not to mention the regions with the highest GDP *per capita* (Table 1). The poor development of the job-creating SME sector is seen as one of the main barriers to rural development. This is particularly noticeable in rural areas distant from urban agglomerations and important transport routes [Kłodziński 2013], which is typical of rural areas within the Macroregion. One consequence of this is that the unemployment rate in the labour market of the studied area also differs significantly from other regions in Poland (Table 1). With regard to unemployment in rural areas compared to urban areas, it should be emphasised that there is both overt unemployment and much higher hidden unemployment. Added to this is the fact that this is mostly long-term unemployment, with all associated consequences. Furthermore, there are individual districts within the regions where the unemployment rate significantly exceeds (negatively) provincial averages. In the Lublin Province, such districts include: the Włodawa District – 15.5%, the Hrubieszów District – 13.3%, and the Chełm District – 13.2% [WURP 2019b]. In the Podlasie Province, unemployment was highest in the districts of Kolno – 14.1%, and Grajewo – 13.7%, and 37.6% of the unemployed lived in the rural areas of the region [WURP 2019a] (this was the lowest rate in the examined area). In Subcarpathia, the highest unemployment rates were 16.6% in the Nisko District and 16.5% in the Lesko District. In this region, as many as 63.1% of the unemployed lived in rural areas [WURP 2019c] and this was the highest share of the unemployed living in rural areas in the entire Eastern Poland Macroregion, going hand

Table 1. Selected indicators characterising the examined area compared to the entire country in 2018

Region (NUTS 2)	GDP <i>per capita</i> [PLN]	Urbanisation indicator [%]	SMEs/1,000 inhabitants	Unemployment rate [%]
Mazovia Province	88,626	64.4	76.3	4.9
Lower Silesia Province	60,562	68.6	59.1	5.2
Greater Poland Province	59,643	54.3	62.2	3.2
Silesia Province	57,384	76.7	50.9	4.3
Pomerania Province	53,669	63.7	60.7	4.9
Łódź Province	51,393	62.5	51.8	6.1
Lesser Poland Province	50,861	48.2	59.2	4.9
West Pomerania Province	45,949	68.5	59.5	7.4
Lubusz Province	45,443	64.9	50.2	5.8
Kujawy-Pomerania Province	44,854	59.1	46.8	8.8
Opole Province	43,879	53.3	42.6	6.3
Holy Cross Province	39,926	44.9	42.3	8.3
Podlasie Province	39,622	60.7	43.3	7.7
Subcarpathia Province	39,019	41.1	40.3	8.7
Warmia-Masuria Province	38,094	58.9	41.0	10.4
Lublin Province	37,458	46.5	42.1	8.0
Poland	55,230	60.1	55.5	5.8

Source: own compilation based on Poland Statistics data

in hand with the lowest urbanisation rate in the region. In the Holy Cross Province, these were the Skarżysko-Kamienna District – 15.7% and the Opatów District – 13.7%, and 56.7% of the unemployed resided in rural areas [US Katowice 2019], and in the Warmia-Masuria Province – the Braniewo District, where the unemployment rate was as high as 21.0%, and the Bartoszyce District – 18.8%, and 52.0% of the unemployed resided in rural areas of the region [ZWW-M Olsztyn 2019].

The indicators presented confirm the occurrence of peripheral features in the studied regions, which translates into the underlying demographic processes and the intensification of unfavourable demographic trends. Admittedly, when analysing the changes in the total population in the examined regions over 10 years (based on provincial averages), it is difficult to see any major risks. In two regions (the Lublin and Subcarpathian Provinces), a slight increase in the population can even be observed (but it is more a case of maintaining



the status quo), while the biggest decrease was noted in the Holy Cross Province and amounted to less than 4 p.p. However, in the case of the Holy Cross Province, the situation is even more worrying as it is one of the fastest ageing regions in the country and forecasts indicate that this situation will only get worse [Piotrowska-Piątek, Królik 2017]. Another alarming finding is that all the regions experienced a decline in the population in 2020 and, with the exception of the Subcarpathia Province, it was higher than the national average (Table 2).

In relation to the examined regions, the greatest concern should not be the size of the population (although this is also important), but its structure and the forecasts for this structure over the next few decades. The age and gender pyramid of the population is a good reflection of the state and changes taking place. Analysis shows that all the regions, already at this stage, are dealing with a stagnant pyramid and, with time (according to the forecasts for the upcoming years), its shape will change to a more spindly one, which, in the theory of economics, is considered a regressive shape. Such a pyramid features a weakening base, associated with a decreasing share of young people in the population structure and, at the same time, a growing upper part, i.e. an increasing share of older people – this indicates a clear population ageing process (Figure 1-5).

There is another important detail related to the ageing process – namely that as life expectancy increases, a large “surplus” of women over men (especially over 70) emerges in the population structure. In practice (with the disappearance of the tradition of multi-generational, cohabiting families in Poland), this may mean an intensification of problems related to the provision of care for single, older women. These will be particularly difficult to resolve in rural, poorly urbanised areas. Undoubtedly, one of the main reasons for

Table 2. Selected indicators characterising the population of the examined regions

Region (NUTS 2)	Population 2010 [thousand]	Population 2020 [thousand]	Population dynamics 2010 = 100%	Population density persons per 1 km <sup>2</sup>	Average growth/decline rate 2020 [%]
Lublin Province	2,057.2	2,095.3	100.01	85	−0.62
Podlasie Province	1,189.7	1,173.3	98.62	59	−0.43
Subcarpathia Province	2,101.7	2,121.3	100.01	119	−0.28
Holy Cross Province	1,270.1	1,224.6	96.41	107	−0.76
Warmia-Masuria Province	1,427.1	1,416.5	99.2	60	−0.44
Poland	38,167.3	38,382.6	100.01	121	−0.31

Source: own compilation based on Poland Statistics data



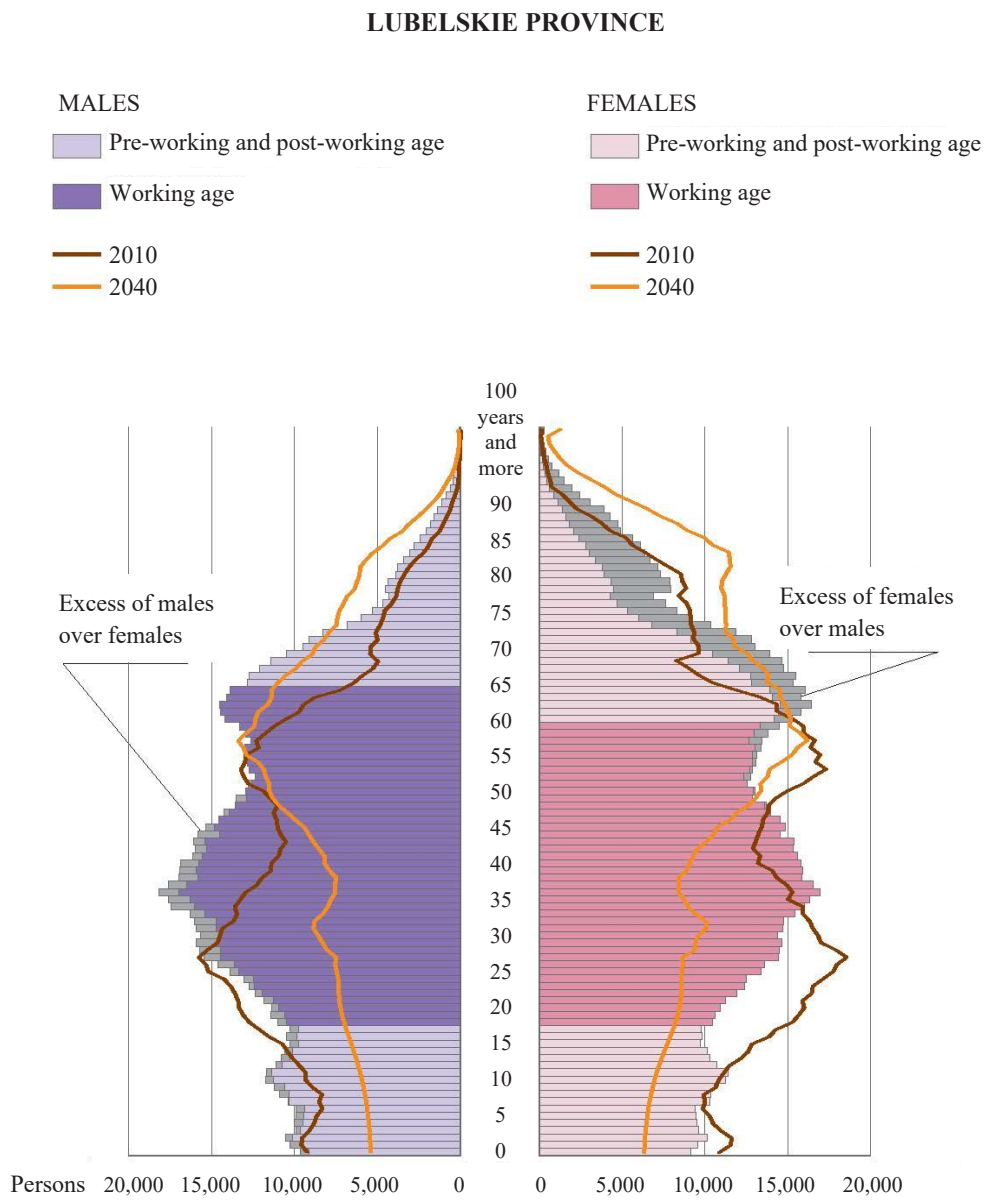


Figure 1. Population by gender and age – the Lublin Province in 2010, 2019 and 2040  
Source: [US Lublin 2020]

PODKARPACKIE PROVINCE

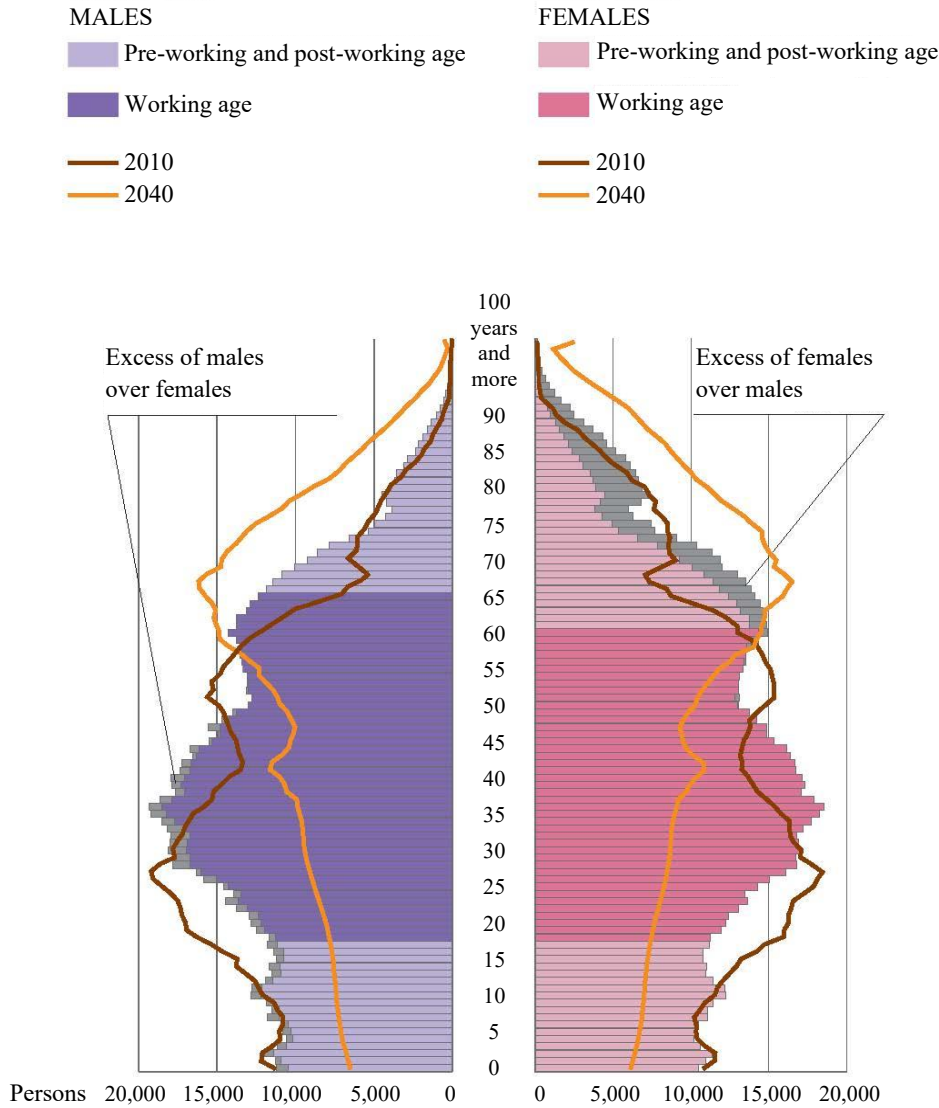


Figure 2. Population by gender and age – the Subcarpathia Province in 2010, 2019 and 2040  
Source: [US Rzeszów 2020]

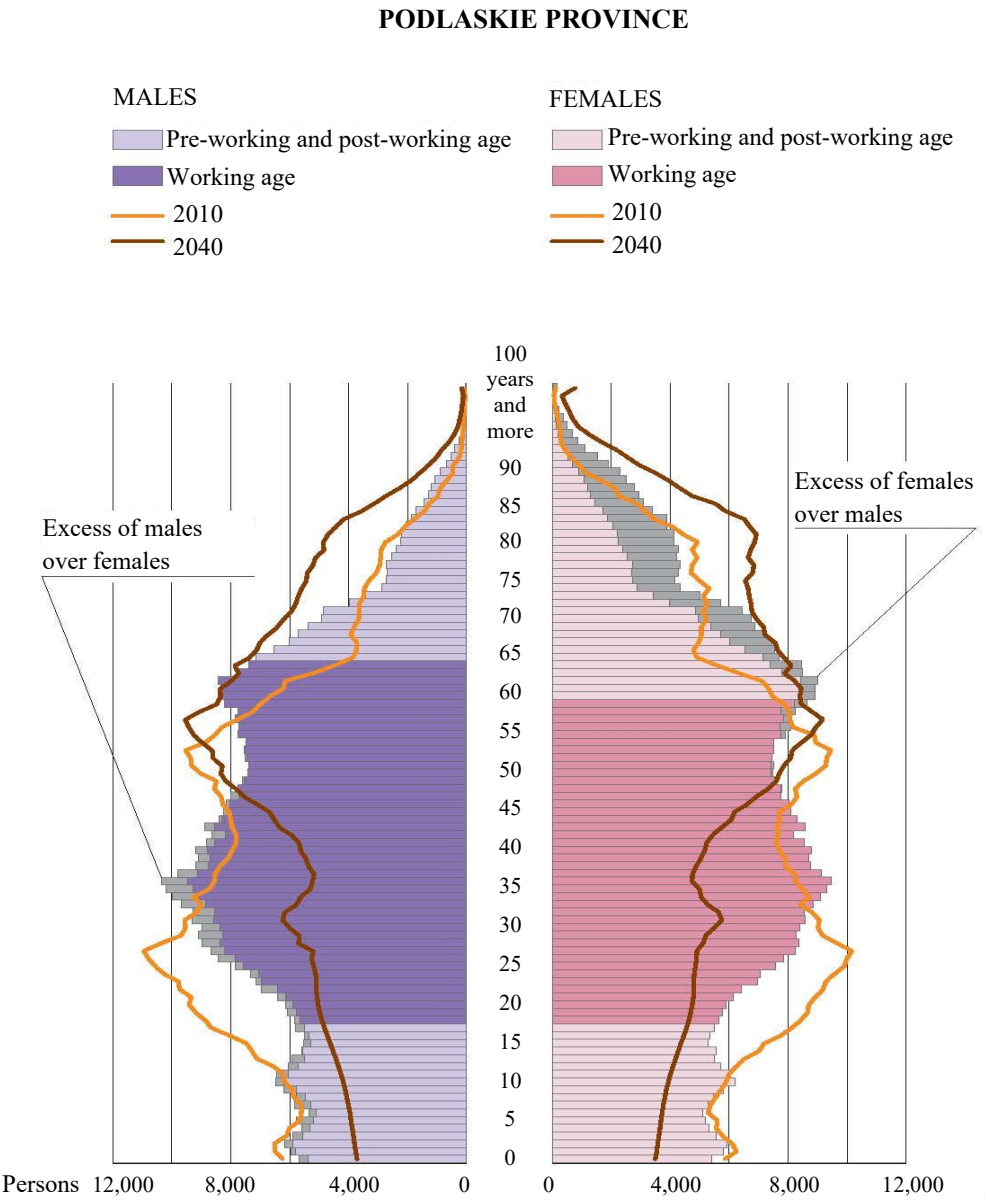


Figure 3. Population by gender and age – the Podlasie Province in 2010, 2019 and 2040  
Source: [US Białystok 2020]

ŚWIĘTOKRZYSKIE PROVINCE

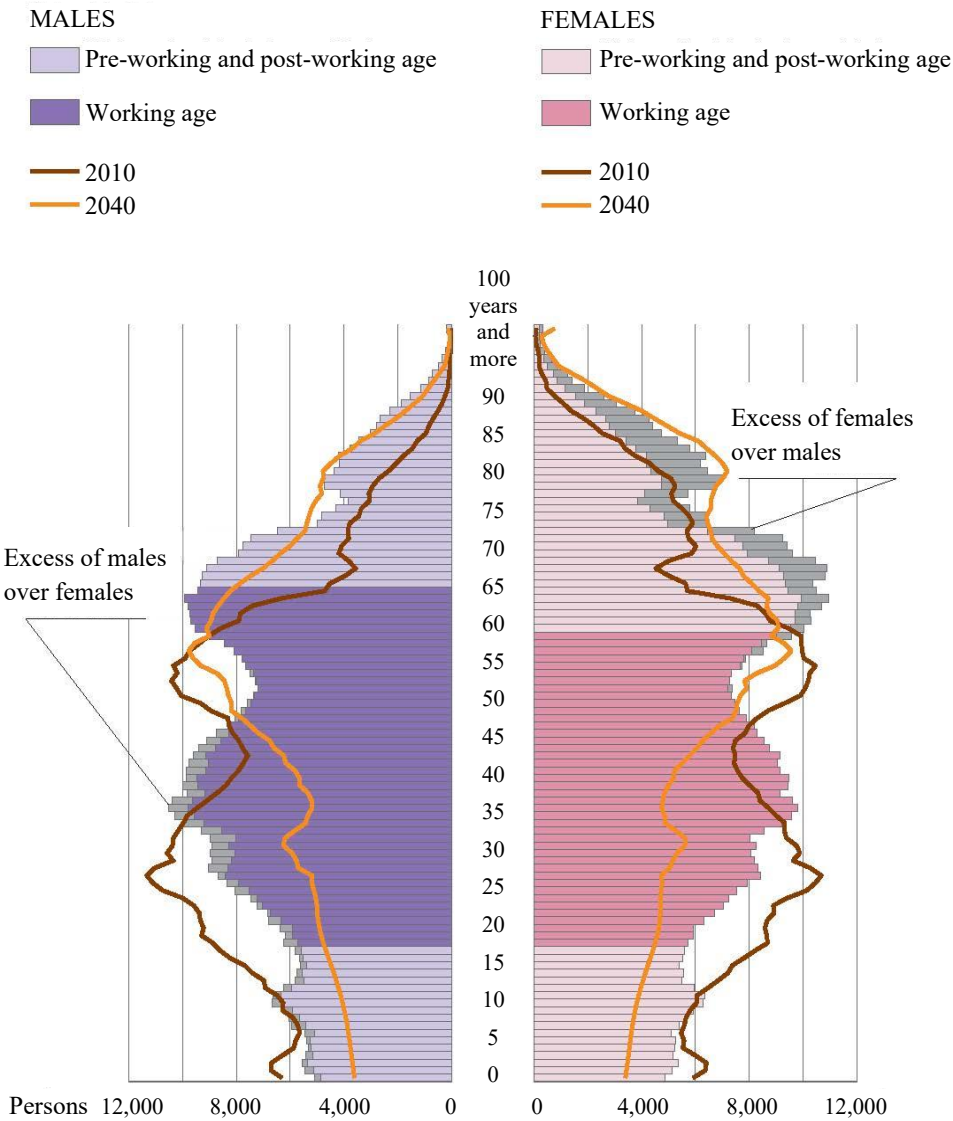


Figure 4. Population by gender and age – the Holy Cross Province in 2010, 2019 and 2040  
Source: [US Kielce 2020]

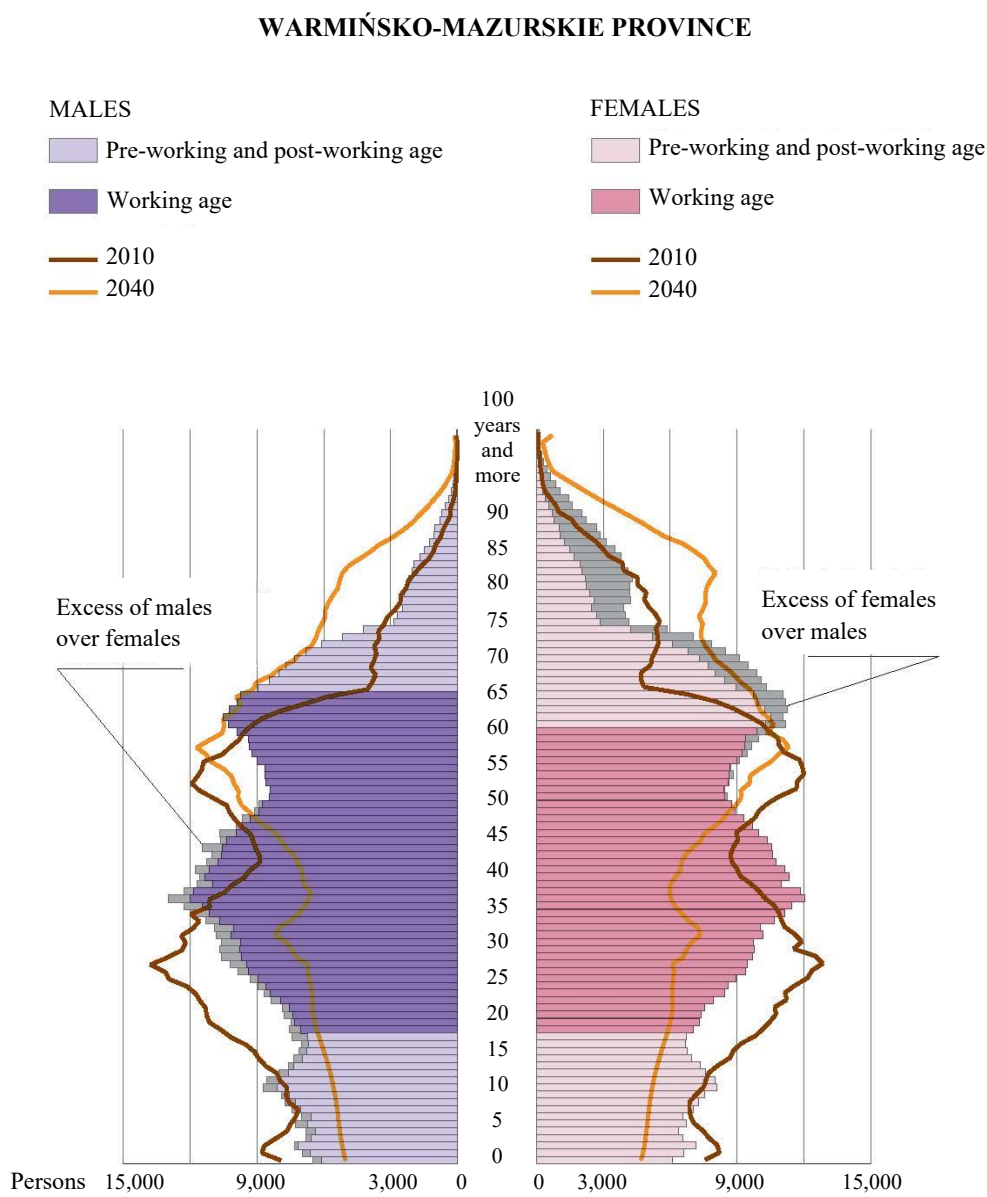


Figure 5. Population by gender and age – the Warmia-Masuria Province in 2010, 2019 and 2040

Source: [US Olsztyn 2020]

unfavourable changes in the population structure is a low birth rate. While in the 21st century most of the analysed regions (except for the Holy Cross and Lublin Provinces) had a positive natural growth rate, in 2000, the Warmia-Masuria Province had a growth rate of 2.6 and the Subcarpathia Province – 2.5 making them leaders in this respect. Still, the forecasts until 2030 indicate that all of them (similarly to other Polish regions) will have a negative natural growth rate.

Negative growth is projected to reach 2.4 in the Subcarpathia Province and 2.9 in the Warmia-Masuria Province. In this respect, both regions will only be placed in the second quadrant of Polish regions, the Podlasie (-3.5) and Lublin Provinces (-3.8) in the third quadrant, and the Holy Cross Province (-5.1) in the last one [Pappelbon 2017]. All this is compounded by migration. As highlighted above, economic factors are one of the main causes of population migration. The generally low position of the regions reflected in the economic indicators deviating not only from the leading regions of Poland but also from the national average, results in negative permanent migration rates. The result is a permanent decline in population. It is, therefore, autonomous depopulation influenced by

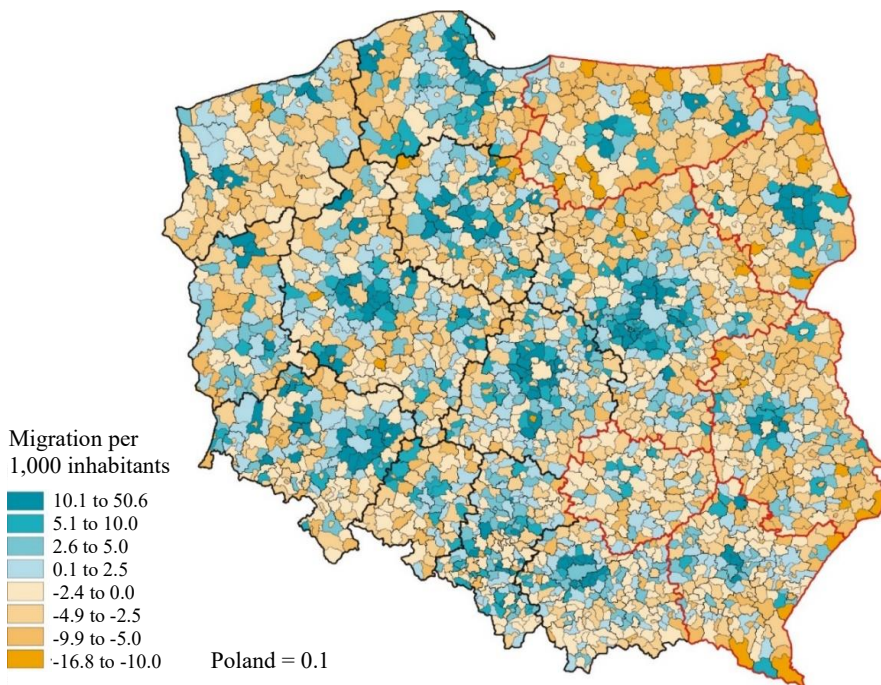


Figure 6. The permanent migration balance in local administrative units (communes) in 2020  
Source: own compilation based on [US Rzeszów 2020]



internal regional factors [Oleński 2020]. The magnitude of the risk of such depopulation, especially at a level of local administrative units (communes), is confirmed by the results of the 2018 migration survey in the examined regions. In the Podlasie Province, as many as 93 out of 118 communes had a negative migration balance [Kamińska-Gawryluk 2020], while in the Subcarpathia Province only 45 out of 160 communes had a positive migration index [Cierpień-Wolan 2020]. A similar situation, i.e. a prevalence of communes with a negative migration balance, was observed in the remaining provinces [Markowski 2020, Morze 2020]. The scale of this problem is confirmed by the balance of permanent migration per 1,000 inhabitants (Figure 6), occurring at a level of communes (local administrative units). The highest intensity of migration is found in peripheral municipalities of individual regions, far from larger urban centres, i.e. in rural areas, including the vast majority of border communes.

At this point, it should be stressed that, in the majority of cases, high migration takes place in communes that already have a very low population density, up to 50 persons per km<sup>2</sup> (Figure 7). This further exacerbates problems associated with the depopulation of such units. The structure of the population leaving such areas is as important as the population loss. Most are active, young and relatively well-educated people (especially

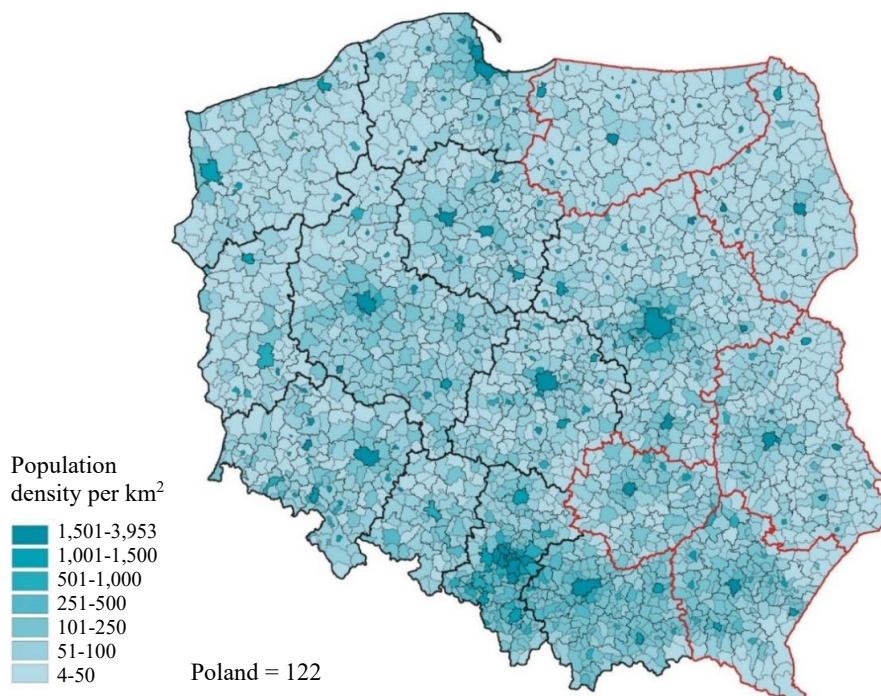


Figure 7. The population density in local administrative units (communes) in 2020  
Source: own compilation based on [US Rzeszów 2020]



women). In such a situation, one may say that migration processes constitute a kind of negative selection of population in the affected areas, leading to the aggravation of depopulation problems. Demographic phenomena and processes caused by depopulation directly affect the economic situation, the labour market and the rational use of human capital, the quality of life and the conditions and prospects for social development, the development and use of space and the outflow of the population [Hryniewicz, Ślusarz 2020]. The negative effects of depopulation are particularly noticeable at a local level [Umiński 2014, Ślusarz 2017].

The areas affected by depopulation cannot cope with related problems on their own, hence a long-term social and economic state policy is necessary for poorly urbanised areas and areas threatened by depopulation to halt the depopulation process and limit its negative effects.

## CONCLUSIONS

The last few years have seen the emergence of unfavourable demographic processes posing a threat to the socio-economic and spatial development of the Eastern Poland Macregion and, in particular, to peripheral rural communes of regions that comprise it. This is a result of both declining fertility, a longer life expectancy and increasing migration processes, which, in the long term, lead to depopulation. Areas characterised by a lower level of economic growth, a peripheral location in relation to larger urban centres, low population density, the low economic activity of inhabitants and high unemployment are particularly threatened in this respect.

The decrease in the total population is accompanied by unfavourable changes in its structure. Forecasts for the regions, covered by the study, indicate a dramatic decrease in the number of people at a pre-productive age and a simultaneous increase in the number of people at a post-productive age, which will undoubtedly lead to the multiplication of economic and social problems.

The implications of these processes may include significant changes in the market for services related to childcare, education and the upbringing of children and young people (the decreasing need for services in these areas is associated with the emergence of many complex problems in the social sphere, including job losses), as well as growing needs related to elderly care, including especially single women, whose life expectancy is significantly longer than men. These structural changes necessitate the search for new, often costly systemic solutions despite limited local budgets (these constraints may be further exacerbated by unfavourable demographic processes, especially a decline in the population and an accompanying fall in the number of enterprises). All this will also be accompanied by increasing difficulties on the labour market related to natural generational

changes, resulting from a large loss of young people, leading to a reduced attractiveness of the place for both business and residence. This will lead to increased migration, fuelling the risk of depopulation.

The greatest cost for the economy (especially at a local level) and for society, in terms of migration, is the permanent loss of highly qualified young, dynamic and entrepreneurial workers, who, to a large extent, determine the attractiveness of a place as an investment location and the development of certain types of economic activity.

Halting unfavourable demographic processes and limiting their negative effects, especially in rural, poorly urbanised areas affected or threatened by depopulation, requires systemic, targeted solutions dedicated to such areas and reflected in the socio-economic and spatial state policy. Experience shows that even a large amount of support for the Macroregion, provided for within the Operational Programme Eastern Poland 2014-2020 (OP EP), which mainly concerned the development of infrastructure, has not inhibited adverse demographic processes in the examined area thus far, and is, therefore, not a sufficient solution to the demographic problems of the Macroregion.

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## DEPOPULACJA W REGIONACH PERYFERYJNYCH POLSKI WSCHODNIEJ – UWARUNKOWANIA I KONSEKWENCJE

Słowa kluczowe: obszary wiejskie, regiony peryferyjne,  
Makroregion Polski Wschodniej, NUTS-2, depopulacja

### ABSTRAKT

W opracowaniu badano procesy demograficzne i wynikające z nich wyzwania dla rozwoju obszarów zagrożonych depopulacją. Badania objęły regiony definiowane w nomenklaturze Unii Europejskiej jako poziom NUTS 2, zaliczane w polskiej polityce regionalnej do Makroregionu Polski Wschodniej. Makroregion ten zaliczany jest do peryferyjnych regionów Polski. Procesy demograficzne w nich zachodzące, a zwłaszcza w wielu lokalnych jednostkach administracyjnych (LAU 2), wskazują na zagrożenie depopulacją. Zakres badań szczegółowych obejmuje lata 2010-2020. Do analizy i prezentacji materiałów wykorzystano metody opisowe, tabelaryczne, graficzne oraz prognozy demograficzne dla analizowanych województw do 2040 roku. Stwierdzono, że nasilają się niekorzystne procesy demograficzne, które stanowią zagrożenie rozwoju społeczno-gospodarczego, w szczególności dla peryferyjnych gmin wiejskich tych regionów. Postępujący spadek płodności, wydłużanie się przeciętnego trwania życia, jak i nasilające się procesy migracyjne prowadzą do niekorzystnych zmian w strukturze ludności, a w dłuższym okresie do depopulacji, co niewątpliwie przełoży się na pomnażanie problemów gospodarczych i społecznych w tych regionach.

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