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DISPARITIES IN SOCIAL DEVELOPMENT OF RURAL AREAS IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT OF POLISH VOIVODESHIPS

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Abstract

The aim of the paper is to assess disparities in social development of rural areas in Poland in the context of sustainable development. Social development is a multidimensional process; therefore, it requires a two-stage research procedure. The first stage consists in the analysis of the regional differentiation of the indicators for social development of rural areas in Poland in the context of implementing the concept of sustainable development, which is further divided into five social components. The second stage is a multidimensional assessment of disparities in social development of rural areas in Poland, carried out using a taxonomic measure of development. This measure enabled both classifying voivodeships in terms of the achieved level of social development of rural areas and identifying voivodeships with similar characteristics. The time scope of the analysis covered 2008 and 2018 , while the territorial scope covered 16 Polish voivodeships.

The study has found a large regional differentiation in terms of social development of rural areas, which confirms the thesis on regional polarization discussed in the literature. It turns out that none of the regions can be regarded as a model example of social development. The results indicate the need for taking measures to reduce development disparities at the social level in rural areas between better and less developed voivodeships. This is necessary to counteract the exclusion of underdeveloped regions.

Keywords: sustainable development, rural areas, social development, multidimensional analysis.

JEL codes: Q01, O18, Q56, C39.

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Introduction

The pursuit of sustainable development is one of the key challenges facing rural areas. The issue of sustainable development of rural areas has often been the subject of research in various scientific disciplines due to the multifaceted nature of this issue (Stanny, 2009; Knapik, 2014; Wrzochalska, 2014; Żmija, 2014; Siudek, Czarnecki and Vashchyk, 2016; Gorb, 2017; Guth and Borychowski, 2017; Wilkin, 2018; Wojciechowska-Solis, 2018; Firlej, Olejniczak, Pondel, 2019; Halamska, 2020; Kołodziejczak, 2020; Wilkin and Hałasiewcz, 2020). Nevertheless, in the case of rural areas, the issue of social development aimed at improving the standard and quality of life, and even rebuilding the social capital of the inhabitants becomes of particular importance. In the most general terms, social development is associated with positive changes occurring in each area, and spatial diversity is its significant feature.

Considering the circumstances justifying examining the issues of sustainable development of rural areas in the context of social development, the aim of the article was to assess disparities in social development of rural areas in Poland in the context of sustainable development. It was considered that a regional approach should allow for a more detailed identification of the social determinants of sustainable rural development in Poland.

In the article, the scope of spatial (regional) differentiation of social development in rural areas was assessed in terms of changes in the size of individually selected social indicators. When selecting the indicators, their usefulness, universality, measurability, and availability were considered. A relative taxonomic measure of development was used to assess the phenomenon. The measure enabled both classifying the voivodeships in terms of the achieved level of social development of rural areas and identifying voivodeships with similar characteristics. The analysis covered 2008 and 2018, with few exceptions for some indicators due to the lack of data for specific years. The territorial scope of the analysis covered 16 Polish voivodeships.

The essence of social development in the context of sustainable development

Sustainable development is a concept that focuses on the quality of human life and health. Achieving the desired state in this respect is possible thanks to the appropriate management of five categories of capital: natural, economic, human, social, and integrating, i.e., considering the plane of "limited capital substitution" and the plane of "complementarity of capitals" (Adamowicz and Dresler, 2006; Adamowicz and Smarzewska, 2009). The idea is to achieve balance in three main dimensions: economic (meaning the pursuit of a sustainable economy), social (meaning protection of public health, education, and social integration), and environmental (meaning emphasis on the protection of the environment and natural resources) (Bluszcz, 2016). It should be noted that economic growth, social progress, and environmental order are regarded as interdependent phenomena, which implies the need for synergistic problem solving on the path of sustainable development

(Barska and Jędrzejczak-Gas, 2019). Sustainable development means development that contributes to the improvement of the quality of life and ensures the prosperity of the present generations, but at the same time does not threaten the possibilities of meeting the needs of future generations (Burny, Gaziński, Nieżurawski and Sobków, 2019; Wyrwa, Barska, Jędrzejczak-Gas and Siničáková, 2020). Sustainable development is also implemented in three dimensions: purposeful, territorial, and time (Meyer, 2005, citing: Adamowicz and Smarzewska, 2009; Meyer, 2005). Successful sustainable development of a country or region is determined on the basis of their ability to achieve the highest possible living standards with the least possible environmental degradation (McKenzie, 2004).

One of the three pillars of sustainable development is social development, most often associated with the process of quantitative and qualitative positive changes occurring in social components such as education, health, and the wealth of the society. It is associated with significant and irreversible changes in social structures that occur under the influence of specific natural, demographic, social, economic, and political indicators (Barska, Jędrzejczak-Gas, Wyrwa and Kononowicz, 2020; Wyrwa et al., 2020). In practice, this would mean equal access to key services, comparable living standards, providing similar opportunities for personal development, equal access to the surrounding nature, intergenerational equality, the possibility of citizens' participation in politics, especially at the local level, a sense of community belonging (McKenzie, 2004). On the other hand, according to Kokoszka (2009, pp. 105-106),

> "sustainable development of rural areas is a direction of economic development and related social development which enables maintaining environmental status, and even its restitution, as well as lack or significant limitation of negative irreversible phenomena occurring in it, with simultaneous exploitation of natural resources, implementation of investments, creation of techniques and technologies for the multiplication of the economic, natural, and social foundations of meeting the needs of present and future generations".

The aim of rural development is to create appropriate living conditions and income-generating opportunities in the local environment, and to improve access to public goods and services for residents (Stanny, 2013). As Zegar (2012) points out, the issue of sustainable rural development is gaining more and more importance along with progressive environmental degradation, risk related to the provision of public goods, negative effects of excessive urbanization, and reduced rural landscape resources and cultural values. It becomes necessary to solve problems such as accelerating the process of disagrarization, reducing poverty in rural areas, and managing the excess of unused labor resources. The social dimension of sustainable rural development concerns mainly the standard of living of the population, access to public services, demographic changes, and health protection issues (Stec, Filip, Grzebyk and Pierścieniak, 2014; Stępniak, Wiśniewski, Goliszek and Marcińczak, 2017). The model of regional policy implemented by the European Union (EU) is based on endogenous and exogenous potential, and its main goal is economic and social

strengthening, as well as striving for territorial cohesion and reducing development disproportions between regions, e.g., in particular, reducing distances between rural regions (Dudek and Wrzochalska, 2017). Already the Lisbon Strategy established the main goal aimed at making the community of EU countries the most dynamically developing economy in the world, while respecting the principles of sustainable development. This requires building the EU's competitiveness and territorial cohesion, both in the regional and local dimensions (Stanny, 2009). Planning and managing sustainable development at the regional and local levels are the basic tasks of local authorities. Implementing this task is related to its measurement, however, as Borys (2011) points out, there is no universal method of such measurement, and the basic tools for monitoring this concept are indicators of sustainable development. Such measurement is of key importance when looking for solutions favorable to improving the standard of living and economic growth, as well as maintaining the quality of the natural environment (Uglis and Jęczmyk, 2015).

In the opinion of Czudec, Miś, and Zając (2018), the need for examining sustainable rural development in terms of regions is a consequence of:

- increasing multifunctionality of rural areas, the development of which requires preserving high values of the natural environment;
- accumulating important development potential in rural areas (human capital, natural capital), which is underused;
- need for preventing further internal stratification of rural areas;
- need for preserving the landscape values and maintain the cultural identity of the rural inhabitants.

Monitoring the spatial differentiation of sustainable development of rural areas in the regional dimension is a source of valuable information for local authorities.

Materials and methods

From the point of view of multidimensional statistics, social development is a phenomenon that is directly immeasurable, but it is described by several indicators that should be substantively related to this concept. A comprehensive approach to the assessment of social development is a complicated issue, and the limited availability of comparable statistical data and no widely accepted, universal solutions in the field of assuming diagnostic features increase difficulties with a reliable presentation of analyses in a regional perspective. Difficulties in the selection of appropriate indicators describing the level of social development made it necessary to use features that testify to its selected aspects. When selecting the diagnostic features that best characterize the level of social development in rural areas in the context of sustainable development, the following indicators were considered: firstly, the relationship of a given feature and the indicators determining sustainable development, and secondly, the possibility of making comparisons between regions in Poland. The recognition of the issue in literature studies and a review of research conducted in this field were the starting point for the undertaken activities. Indicators from the generally accessible databases of Statistics Poland were analyzed, including information contained

in the STRATEG system, Local Data Bank, Statistical Yearbooks of the Regions and other studies by Statistics Poland concerning rural areas.

When selecting diagnostic features, their relevance to the evaluation of the social development of rural areas and the availability of comparable data for 2008 and 2018 were considered. Among the features characterizing the level of social development of rural areas, a set of indicators was selected, which is the most important for the described phenomenon and provides the most important information about its essence. The analysis and assessment of the level of social development of rural areas in the context of sustainable development required assuming indicators that represented the entire study population. On this basis, 29 indicators in two-time sections were selected to measure disparities in social development of rural areas in Poland. Finally, five groups of factors (the so-called social components) were distinguished, including: demographic potential – 10 indicators (34.5%), education – 3 indicators (10.3%), labor market – 5 indicators (17.3%), access to healthcare – 3 indicators (10.3%), and infrastructure – 8 indicators (27.6%).

Table 1 presents indicators for various social components shaping sustainable development of rural areas.

The preliminary list of features was selected according to the degree of variability (elimination of indicators that do not differentiate the examined objects – quasi-constants), the level of correlation of indicators (elimination of repeating the same information provided by various features), and data completeness for the examined objects. Substantive selection was assumed as superior, and to select indicators, statistical criteria were also used in terms of dispersion and correlation. Considering the postulate of the discrimination of features, the coefficient of variation was used to eliminate quasi-constant indicators, arbitrarily assuming the threshold value most often determined in the research at the level of 0.1. The indicators eliminated due to insufficient volatility include the following features: X9, X10, X11, X14, X17, X18, X22, X25, X28, X29. Another criterion for the selection of indicators was the assessment of the correlation of pairs of diagnostic features for each year. The features should not duplicate information provided by other indicators (poorly correlated with each other) and be highly informative (strongly correlated with other features rejected as diagnostic). The observed relatively strong correlations were each time subject to a thorough substantive assessment in terms of providing some specific information by the features indicated in this way, ultimately affecting the social development of rural areas in Poland. On this basis, it was decided to further reduce the set of indicators. Due to the excessively high degree of correlation of pairs of diagnostic features, the following indicators were removed from the further analysis: X1, X4, X6, X21, X23. Consequently, the applied approach resulted in series of statistical data for 14 indicators assumed as the final set of diagnostic features. Then, the nature of each of the features was determined, distinguishing stimulants and destimulants. When identifying the type of indicators regarding their impact on social development, it was assumed that features marked with symbols X5, X9, X15 are destimulants, and the other indicators are stimulants.

Table 1

Indicators adopted in the study to measure the social development level in the context of sustainable development of rural areas in Poland

Indicator symbol	Indicator name
	Demographic potential
X1	Average population in one rural locality
X2	Population density (in persons per 1 km²)
X3	Natural increase per 1,000 population in rural areas
X4	Live births per 1,000 population in rural areas
X5	Infant deaths in rural areas per 1,000 live births
X6	Net migration in rural areas per 1,000 population
X7	Net internal migration in rural areas in total
X8	Net international migration in rural areas in total
X9	(non-working age population per 100 working age population)
X10	Total fertility rate
	Education
X11	Gross enrollment rate for primary schools for children and youth in rural areas
X12	Gross enrollment rate for junior high schools for children and youth in rural areas
X13	Readers of public libraries (with branches) in rural areas per 1,000 population
	Labor market
X14	Employment rate in rural areas (%)
X15	Unemployment rate in rural areas (%)
X16	Employed persons in rural areas per 1,000 population
X17	Economic activity rate in rural areas (%)
X18	Working age population of rural areas in % of the total population
	Access to healthcare
X19	Number of doctors per 10,000 population
X20	Advice provided in outpatient healthcare in rural areas per capita
X21	Population in rural areas per one pharmacy and pharmacy point
	Infrastructure
X22	Percentage of dwellings in rural areas fitted with water supply system (in % of total dwellings)
X23	Percentage of dwellings in rural areas fitted with gas supply system(in% of total flats)
X24	Percentage of dwellings in rural areas fitted with central heating (in% of total flats)
X25	Population of rural areas using water supply system in % of the total population of rural areas
X26	Population of rural areas using sewage system in % of the total population of rural areas
X27	Population of rural areas using gas supply system in % of total rural population
X28	Useful floor area of a dwelling per capita
X29	Average number of persons per one dwelling

Source: authors'own study.

In scientific research, it is important to define the territorial scope of research, which was related to defining the notion of rural areas. In Poland, various methods of delimiting rural areas are used. As part of official statistics, data on rural areas is collected according to four divisions (Borawska, 2017, p. 277): (1) rural areas according to the National Official Register of the Territorial Division of the Country (TERYT), (2) definition assumed for the purposes of the 2014-2020 Rural Development Program, (3) typology of OECD regions, (4) typology of Eurostat regions. There is no official definition of rural areas in official statistics. Statistics Poland distinguishes them on the basis of the territorial division of the country using TERYT identifiers. According to this classification, rural areas are areas outside the administrative borders of cities, they include rural municipalities and rural areas of urban and rural municipalities.

In this article, it was assumed that rural areas refer to areas located outside the administrative borders of cities. According to Statistics Poland (2020), rural areas in Poland constitute 93.2% of the total area of the country, and the areas are inhabited by nearly 40% of the country's population. At this point, however, it is necessary to mention the limitation resulting from the assumed administrative division (into urban, urban and rural, and rural municipalities), which is not unchanging. Practically every year, it is subject to certain adjustments, which mainly consist in giving the status of a town/city to rural localities and adjusting the administrative boundaries of municipalities, less often creating new municipalities, and depriving localties of the town/city status. As a result, the presented data may contain some errors (Borawska, 2017, p. 277).

In the first stage of the research, the basic measures of descriptive statistics were used (mean, median, minimum/maximum values, the coefficient of variation, and dynamics), as well as the analysis of indicators. It was assumed that the basic methods of statistical description would allow for drawing conclusions regarding the diversification of rural development in the social dimension.

The second stage of the research consisted in assessing the diversification of the level of social development of rural areas in Poland using a taxonomic measure. A relative development coefficient was used in the study, as expressed by the following formula:

$$W_i = \frac{100}{k} \sum_{j=1}^{k} \alpha_j z_{ij}$$

where:
W_i – relative development rate,
k – number of variables considered in the study,
α_j – weight of the j variable,
z_{ij} – standardized by means of a zero unitarization of the statistical xij feature values of included in the study.

It is an aggregate measure which is the arithmetic mean of the diagnostic variables reduced to comparability by means of a zero unitization multiplied by 100. A higher value for the aggregate formula, ranging from 0 to 100, ensures a higher rank. The relative measure of development adopted in the study is methodically consistent with the Summary Innovation Index (SII) commonly used in the EU nomenclature (Klóska, 2017, p. 162). The approach used is therefore known and is often used in practice. Possible weighing of features is a methodological dilemma, but so far this issue has not been unequivocally resolved, nor has a generally accepted procedure been developed, and therefore for the purposes of this article the same significance was given to each feature and equal weights were applied as in the case of most studies (Walesiak and Obrębalski, 2017).

On the basis of the relative development coefficient, voivodeships were divided into groups with a similar level of development. To determine class boundaries, the arithmetic mean (d) and standard deviation (s) of Wi values were used, obtaining the following classification (Fura, 2015, p. 111):

Group I – voivodeships with a high level of development: $W_i > d + s$,

Group II – voivodeships with a development level above the average: $d < W_i \leq d + s$,

Group III – voivodeships with a development level below the average: $d - s < W_i \leq d$,

Group IV – voivodeships with a low level of development: $W_i \leq d - s$.

Results and discussion

The taxonomic procedure classifying voivodeships according to the level of social development of rural areas was preceded by a descriptive analysis aimed at presenting the basic statistical measures at the voivodeship level.

The analysis of changes in the level of social development of rural areas (in the context of the implementation of the concept of sustainable development) was carried out in five thematic areas, the so-called social components, and in two--time periods, i.e., 2008 and 2018. Adopting such an approach made it possible to show the changes that occurred in 2018 in relation to 2008.

Demographic potential is the first studied component, which was characterized on the basis of 10 indicators (Table 2). They are features of fundamental significance in the context of the determinants of sustainable development, because improving demographic indicators in rural areas entails the development of other positive features shaping such a development model (Jakubowski and Bronisz, 2019).

In 2018, the highest percentage of rural population was recorded in four voivodeships: Podkarpackie, Świętokrzyskie, Lubelskie, and Małopolskie. Rural population in the regions accounted for more than 50% of the total population. On the other hand, the lowest percentage of the rural population was recorded in the Śląskie Voivodeship. When analyzing the changes in this respect in 2008 and 2018, it should be noted that the percentage of rural population decreased only in five voivodeships, i.e., Lubuskie, Łódzkie, Opolskie, Podkarpackie, and Podlaskie.

On the other hand, in the remaining voivodeships there was a slight increase, and it was the highest was in the following voivodeships: Pomorskie (8%), Śląskie (7.4%), and Dolnośląskie (6.4%).

The greatest differentiation of voivodeships in terms of demographic potential (coefficient of variation above 100%) could be observed for the following indicators: natural increase per 1,000 population in rural areas, net migration in rural areas per 1,000 population, net internal migration in rural areas in total, and net international migration in rural areas in total. The analyzed data indicates that the demographic structure in rural areas in Poland is strongly diversified. In 2018, rural areas were inhabited by 15,343,904 persons, i.e., 39.9% of the country's population (Statistics Poland, 2020). From 2008-2018, the population in rural areas decreased by 4.3%. The average size of a rural locality in Poland in terms of population in 2018 was 292 inhabitants per one rural locality. The highest number of persons per one rural locality was recorded in the Małopolskie Voivodeship (903), and the lowest in the Podkarpackie Voivodeship (123).

In Poland, there is a large regional differentiation in terms of population density in rural areas. Stanny (2009, p. 249) indicates that next to areas with low population density, characterized by a distorted gender ratio and age structure characteristic of the "regressive age pyramid", there are also relatively demographically young areas which are centers of concentration of migratory inflow, both from rural and urban areas.

When analyzing the changes in population density in rural areas in 2008 and 2018, it should be noted that it decreased only in four voivodeships, i.e., Lubelskie, Opolskie, Podlaskie, and Świętokrzyskie. In the Zachodniopomorskie Voivodeship, population density did not change, while in the remaining regions there was a slight increase in population density in rural areas. It was the highest in the following voivodeships: Pomorskie (14.2%), Wielkopolskie (8.6%), and Dolnośląskie (6.7%). In these regions, the situation was partly a consequence of settling of the urban population in rural areas adjacent to large agglomerations, which is part of the process referred to as re-ruralization (Halamska, 2016a) and favorable changes in the field of natural increase.

The current trend of changes in the population size is indicated by the natural increase rate. It is the difference between the number of births and the number of deaths presented per 1,000 population in a period of one year. When analyzing the rate of natural increase, it should be noted that in 2018 it was negative in eleven voivodeships. On the other hand, the clearly highest positive natural increase was recorded in the Pomorskie Voivodeship (4.7), followed by Wielkopolskie (2.4), and Małopolskie (2.4). In the Kujawsko-Pomorskie Voivodeship, the natural increase was also slightly positive (0.2).

Table 2

Selected statistics on the development of indicators for the demographic potential in rural areas in Polish voivodeships in 2008 and 2018

Indicator name	Year	Descriptive statistics				
		Min.	Max.	Median	Mean	Coefficient of variation (%)
Average population in one rural locality	2008	121.8 (podlaskie)	837.8 (małopolskie)	261.2	339.2	67.4
	2018	123.0 (podkarpackie)	903.0 (małopolskie)	278.5	359.2	67.5
Population density (in persons per 1 km²)	2008	24.3 (warmińsko-mazurskie)	123.0 (małopolskie)	50.1	55.2	53.1
	2018	24.1 (warmińsko-mazurskie)	130.2 (małopolskie)	52.5	57.0	54.5
Natural increase per 1,000 population in rural areas	2008	-2.2 (podlaskie)	7.0 (pomorskie)	1.3	1,4	183,2
	2018	-4.1 (podlaskie)	4.7 (pomorskie)	-0.7	-0.5	479.3
Live births per 1,000 population in rural areas	2008	8.9 (opolskie)	14.7 (pomorskie)	11.2	11.5	11.8
	2018	8.8 (opolskie)	12.7 (pomorskie)	9.8	10.1	10.8
Infant deaths per 1,000 live births	2008	3.5 (świętokrzyskie)	8.5 (dolnośląskie)	5.3	5.6	22.3
	2018	3.1 (małopolskie)	5.1 (lubuskie)	4.4	4.3	13.9
Net migration in rural areas per 1,000 population	2008	-1.8 (warmińsko-mazurskie)	4.8 (wielkopolskie)	2.4	1.9	113.8
	2018	-2.1 (warmińsko-mazurskie)	5.8 (dolnośląskie)	1.2	1.5	165.5
Net internal migration in rural areas in total	2008	-797 (warmińsko-mazurskie)	7,282 (wielkopolskie)	1,640.0	2,428.1	102.7
	2018	-1,307.00 (lubelskie)	7,440 (wielkopolskie)	861.5	1,768.8	150.7
Net international migration in rural areas in total	2008	-1,774 (opolskie)	61 (mazowieckie)	-139.0	-296.8	158.3
	2018	-427 (opolskie)	381 (mazowieckie)	106.0	86.6	200.2
Age dependency indicator	2008	53.0 (dolnośląskie)	71.0 (podlaskie)	58.5	59.9	8.4
	2018	56.4 opolskie	63.9 łódzkie	60.3	60.4	3.9
Total fertility rate	2009	1,147 (opolskie)	1,548 (pomorskie)	1,384	1,384	6.6
	2018	1,228 (opolskie)	1,707 (pomorskie)	1,413	1,395	9.0

Source: authors' own study based on data from Statistics Poland.

The so-called migratory activity was another indicator characterizing demographic potential. It is calculated as the ratio of the net migration to the migration turnover and has negative values for areas of migration loss, and positive for migration increase (Stanny, Rosner, and Komorowski, 2018, p. 136). Zero means equivalent population exchange, and therefore an outflow balanced by the inflow. The rationale for using this indicator is that migrants tend to leave regions that are underdeveloped, lack attractive living and working conditions, and tend to move to regions that offer better prospects. The net migration per 1,000 population enables assessing attractiveness of the region. A positive net migration indicates attractiveness of a given place in terms of social, economic, and ecological aspects. In 2018, a negative net migration per 1,000 rural population was observed in the following six voivodeships: Lubelskie, Opolskie, Podkarpackie, Podlaskie, Świętokrzyskie, and Warmińsko-Mazurskie. The highest positive net migration per 1,000 rural population in the analyzed period was recorded in three voivodeships: Dolnośląskie (5.8), Pomorskie (5.4), and Wielkopolskie (4.7), followed by the Śląskie (2.9), Łódzkie (2.7), and Mazowieckie (2.7) Voivodeships. However, in the remaining four voivodeships, i.e., Kujawsko-Pomorskie, Lubuskie, Małopolskie, and Zachodniopomorskie, net migration per 1,000 rural population was slightly positive.

When assessing the impact of demographic characteristics of population on social conditions, the age dependency ratio is usually also used, which shows the ratio of the number of persons in non-working age to the number of persons in working age. In 2008, the highest age dependency ratio was observed in the following voivodeships: Podlaskie (71.0), Lubelskie (67.0), and Łódzkie (64.0), whereas the lowest one in Dolnośląskie (53.0), Lubuskie (54.0), and Zachodniopomorskie (55.0). On the other hand, in 2018, the lowest age dependency rate of the rural population was recorded in two voivodeships, i.e., Opolskie (56.4) and Warmińsko-Mazurskie (56.8). Nevertheless, it was clearly the highest in the following four voivodeships: Łódzkie (63.9), Lubelskie (63.2), Mazowieckie (63.2), and Podlaskie (63.0). From 2012-2018 the number of working age population in Polish rural areas increased by about 9.71%. At the same time, during this period the share of persons at pre-working age in rural areas decreased by about 18.94% and the percentage of persons at post-working age increased by 23.03%.

The fertility rate reflects the average number of children born to a woman over the entire reproductive period. To ensure simple replacement of generations, its value should be in the range from 2.1 to 2.15. The value of the rate below this range indicates rapid aging of the society. In Poland, there is little regional differentiation in terms of the fertility rate. In 2018, the highest fertility rate was recorded in the following four voivodeships: Pomorskie (1.707), Wielkopolskie (1.603), Mazowieckie (1.542), and Małopolskie (1.529). Whereas it was the lowest in the Opolskie (1.228) and Warmińsko-Mazurskie (1.255) Voivodeships. When analyzing the changes in this respect in 2009 and 2018, it should be noted that decreased fertility rates were observed in the following five voivodeships: Lubelskie, Lubuskie, Świętokrzyskie, Warmińsko-Mazurskie, and Zachodniopomorskie. In the remaining voivodeships, the fertility rate slightly increased.

There is a distinct aging of the population in rural areas. The main reasons for the intensified aging process of the population include, firstly, the negative natural increase and the outflow of people, especially those at the working age, from many regions in the country. At the same time, the number of rural population aged more than 70 has significantly increased. This is particularly the case of the group of rural women. According to the data from Statistics Poland (2020), in 2018, rural areas were inhabited by 2,310,040 persons aged over 65, including 59% of women.

Other features characterizing the situation on the labor market were other social indicators that were assessed in terms of the possibilities of sustainable development of rural areas in individual regions of Poland. This has been described on the basis of five indicators (Table 3).

Table 3

Selected statistics on the development of indicators for the labor market in rural areas in 2008 and 2018

Indicator name	Year	Descriptive statistics				
		Min.	Max.	Median	Mean	Coefficient of variation (%)
Employment rate in rural areas (%)	2008	40.6 (zachodniopomorskie)	55.0 (mazowieckie)	50.0	49.6	8.1
	2018	48.4 (warmińsko-mazurskie)	58.9 (wielkopolskie)	53.0	53.3	5.1
Unemployment rate in rural areas (%)	2008	5.1 (śląskie)	12.2 (zachodniopomorskie)	6.9	7.3	27.5
	2018	1.8 (wielkopolskie)	7.0 (podkarpackie)	4.3	4.3	35.9
Employed persons in rural areas per 1,000 population	2009	70 (lubelskie)	144 (wielkopolskie)	95.3	96.7	22.3
	2018	81 (świętokrzyskie)	189 (wielkopolskie)	116.2	119.2	24.5
Economic activity rate in rural areas (%)	2008	46.5 (zachodniopomorskie)	588 (mazowieckie)	54.2	53.4	7.1
	2018	51.6 (warmińsko-mazurskie)	60.1 (łódzkie)	55.0	55.6	4.3
Working age population of rural areas in % of the total population	2008	58.3 (podlaskie)	65.2 (dolnośląskie)	63.2	62.6	3.1
	2018	61.0 (łódzkie)	63.9 (opolskie)	62.4	62.4	1.5

Source: authors' own study based on data from Statistics Poland.

When analyzing the data presented in Table 3, it can be noticed that there is a large regional differentiation in terms of the situation on the labor market in rural areas in Poland. Among the analyzed labor market indicators, unemployment rate was the most differentiating indicator (the coefficient of variation in 2018 was 35.9% and increased by 23.5%, as compared to 2008).

In recent years, Polish rural areas witnessed employment growth and decline in unemployment. From 2008-2018, the employment rate increased from 19.6 to 53.3%, and at the same time the unemployment rate decreased from 7.3% to 4.3%.

When analyzing the unemployment rate among the rural population, it should be noted that in 2018 it was the highest in the following four voivodeships: Podkarpackie (7.0%), Warmińsko-Mazurskie (6.8%), Lubelskie (6.7%), and Świętokrzyskie (5.6%).

On the other hand, the lowest unemployment rate among the rural population in the analyzed period was clearly observed in the following voivodeships: Wielkopolskie (1.8%), Podlaskie (2.6%), and Małopolskie (2.9%). When analyzing changes in the unemployment rate in 2008 and 2018, it can be concluded that the unemployment rate in rural areas decreased in all voivodeships. This is certainly a very positive phenomenon, especially regarding the opportunities for sustainable rural development. The highest decrease in the unemployment rate was clearly visible in the following three voivodeships: Wielkopolskie (70.9%), Zachodniopomorskie (63.9%), and Dolnośląskie (60.1%), while the lowest in two voivodeships, i.e., Podkarpackie (2.8 %) and Lubelskie (4.3%), followed by: Warmińsko-Mazurskie (12.8%), Łódzkie (20.7%), Świętokrzyskie (25.3%), Śląskie (25.5%), and Mazowieckie (28.1%).

Considering the indicator of employed persons in rural areas per 1,000 population, it should be noted that in 2018 it was the highest in the following voivodeships: Wielkopolskie (189), Dolnośląskie (156), Śląskie (145), and Pomorskie (142), and then also in the following voivodeships: Łódzkie (133), Mazowieckie (127), Kujawsko-Pomorskie (127), Lubuskie (117), Zachodniopomorskie (116), Opolskie (105), and Warmińsko-Mazurskie (103). The lowest employment rate per 1,000 population in rural areas in the analyzed period was recorded in three voivodeships, i.e., Świętokrzyskie (81), Lubelskie (84), and Podlaskie (89), followed by Podkarpackie (95) and Małopolskie (99).

When analyzing the changes in this respect in 2009 and 2018, it should be emphasized that in all voivodeships the indicator of employed persons in rural areas increased. Therefore, this phenomenon should be regarded as a very positive one, especially in the context of sustainable development of rural areas. It is also worth mentioning that in the analyzed period this indicator increased significantly in rural areas in the following voivodeships: Wielkopolskie (31.2%), Mazowieckie (29.6%), and Małopolskie (28.6%),followed by: Dolnośląskie (26.8%), Podkarpackie (26.7%), Zachodniopomorskie (24.7%), Kujawsko-Pomorskie (24.5%), Śląskie (23.9%), Podlaskie (23.6%), Opolskie (22.1%), and Pomorskie (21.4%).

Access to healthcare was the third important component influencing social development in the context of sustainable development. With a relatively limited range of measures available in local aggregation, describing the issues of health in many aspects, three indicators were designated for its description. Simple measures were also used by other researchers (Rosenthal, Zaslavski, and Newhouse, 2005). A summary of the basic descriptive statistics of the assumed indicators for access to healthcare in 2008 and 2018 is presented in Table 4. The structure of voivodeships in this respect is differentiated by all three indicators.

Table 4

Selected statistics on the development of indicators for access to healthcare in rural areas in 2008 and 2018

Indicator name	Year	Descriptive statistics				
		Min.	Max.	Median	Mean	Coefficient of variation (%)
Number of doctors per 10,000 population	2010	28.9 (wielkopolskie)	53.6 (mazowieckie)	40.1	40.0	19.1
	2018	37.2 (warmińsko-mazurskie)	77.0 (mazowieckie)	53.2	53.8	21.7
Advice provided in outpatient healthcare in rural areas per capita	2008	2.0 (zachodnio-pomorskie)	4.2 (śląskie)	3.1	3.1	19.8
	2018	1.8 (lubelskie)	4.5 (śląskie)	3.2	3.0	22.8
Population in rural areas per one pharmacy and pharmacy point	2008	3945 (lubelskie)	7665 (zachodnio-pomorskie)	5533.0	5426.4	20.3
	2018	3348 (śląskie)	7325 (warmińsko-mazurskie)	4758.5	5085.6	22.5

Source: authors' own study based on data from Statistics Poland.

In the context of sustainable development, public health is considered as a set of indicators that have an impact on the individual and their environment. The link between health and the concept of sustainable development is complex and manifests itself on many levels, including quality of life, impact of the environment on the health of society, which in turn is shaped by production patterns, the costs of implementing health tasks. The health condition of a population appears as a basic component of well-being, in addition to material resources, safety, and leisure. Good health condition enables independent functioning in a society, gives the opportunity to provide oneself and one's family with the necessary goods and fulfill one's own aspirations (Bal-Domańska, Wilk, and Bartniczak, 2012, p. 83).

In Poland, there is a large regional variation in rural areas in terms of the number of doctors per 10,000 population. When analyzing this aspect, it should be noted that the Mazowieckie Voivodeship was in the best situation in this respect in 2018, followed by Małopolskie, Śląskie, and Łódzkie. The worst situation in terms

of access to doctors in the analyzed period occurred in five voivodeships, i.e., Warmińsko-Mazurskie, Wielkopolskie, Opolskie, Lubuskie, and Podkarpackie.

The issue of unequal access to healthcare, resulting from the place of residence, concerns not only Poland, but also other countries, which has become the subject of scientific research (Casey, Thiede Call, and Klingner, 2000; Bennett, Probst, Vyavaharkar, and Glover, 2012). In Poland, as indicated by Ucieklak-Jeż and Bem (2017), the basic problems in this area include lack of qualified healthcare workers, distance from major medical centers, limited access to specialist health services, poor prevention, and health promotion, providing healthcare units with diagnostic equipment, fewer pharmacies. Financial barriers related to lower income earned by inhabitants of rural areas (Halamska, 2014) and additional costs resulting from the peripheral location also play an important role.

When analyzing the changes in this respect in 2010 and 2018, it should be emphasized that in all voivodeships access to doctors improved, which should be considered a very positive phenomenon, also in the context of the possibility of sustainable development of rural areas. The greatest improvement in this area was recorded in the following voivodeships: Małopolskie (47.7%), Mazowieckie (43.6%), Śląskie (42.8%), Świętokrzyskie (42.5%), and Kujawsko-Pomorskie (39.6 %).

Due to the dynamics of the processes taking place in the contemporary world, education is considered an important indicator of social development. Therefore, the fourth component monitoring social development concerned education, which was described by three indicators. The basic descriptive characteristics of the indicators concerning education are presented in Table 5. It was assumed that they should cover various levels of the education system and reflect the quality of education at various educational levels. When analyzing selected descriptive statistics, it can be noticed that in the sphere of education, the greatest differentiation of voivodeships in the analyzed period is visible in terms of the gross enrollment rate for junior high schools for children and youth in rural areas.

Gross enrollment rate for primary schools is a measure that indicates demand for educational services at this level offered in each municipality. The spatial distribution of this measure indicates a significant dispersion. In 2018, in 62.5% of voivodeships, this rate did not even reach 80%, and the lowest value was 61.7%. On the other hand, there are voivodeships where the enrollment rate is close to 100%. The highest value was achieved by the following voivodeships: Śląskie and Małopolskie. There is an increase in the education level of the rural population, especially higher education, which is the result of the educational boom in Polish society after 1989, when the number of persons with a higher education degree increased fivefold (Halamska, 2016b). However, in Poland and other EU countries, secondary education, including two types of education: secondary and post-secondary, is predominant among rural population (Halamska, 2015).

Table 5

Selected statistics on the development of indicators for education in rural areas in 2008 and 2018

Indicator name	Year	Descriptive statistics				
		Min.	Max.	Median	Mean	Coefficient of variation (%)
Gross enrollment rate for primary schools for children and youth in rural areas	2008	73.8 (zachodnio-pomorskie)	93.4 (śląskie)	88.2	85.7	7.1
	2018	61.7 (zachodnio-pomorskie)	91.2 (śląskie)	78.2	77.5	10.8
Gross enrollment rate for junior high schools for children and youth in rural areas	2008	51.5 (zachodnio-pomorskie)	86.9 (śląskie)	76.1	71.7	17.5
	2018	45.9 (zachodnio-pomorskie)	84.3 (śląskie)	70.9	68.1	18.9
Readers of public libraries (with branches) in rural areas per 1,000 population	2008	90 (podlaskie)	143 (śląskie)	109.5	112.7	13.0
	2018	73 (podlaskie)	128 (śląskie)	91.0	94.3	16.7

Source: authors' own study based on data from Statistics Poland.

Infrastructure was the last area determining social development from the perspective of sustainable development, illustrated by eight indicators. The basic characteristics of indicators for the infrastructure are presented in Table 6.

The level of their infrastructure equipment is one of the main components determining the social development of rural areas. Rural infrastructure is a combination of many features without which a higher standard of living in the community is not possible. When analyzing the selected descriptive statistics presented in Table 6, it can be noticed that in infrastructure, the greatest differentiation in voivodeships in the analyzed period was visible due to the percentage of dwellings in rural areas fitted with gas supply system and the percentage of rural population using gas supply system. In the voivodeship with the highest percentage of dwellings fitted with gas supply system (Podkarpackie Voivodeship), this indicator was, both in 2008 and 2018, at the level of over 50%, while in the regions with the lowest percentage of dwellings fitted with gas supply system (Kujawsko-Pomorskie and Opolskie Voivodeships) it was not higher than 4%.

Table 6

Selected statistics on the development of indicators for infrastructure in rural areas in 2008 and 2018

Indicator name	Year	Descriptive statistics				
		Min.	Max.	Median	Mean	Coefficient of variation (%)
Percentage of dwellings in rural areas fitted with water supply system	2008	79.4 (lubelskie)	96.4 (zachodnio-pomorskie)	91.8	89.6	7.1
	2018	83.7 (podlaskie)	97.9 (pomorskie)	94.6	92.7	5.1
Percentage of dwellings in rural areas fitted with gas supply system	2008	2.3 (kujawsko--pomorskie)	57.3 (podkarpackie)	9.5	14.7	112.0
	2018	3.5 (opolskie)	60.2 (podkarpackie)	13.2	18.6	89.9
Percentage of dwellings in rural areas fitted with central heating system	2008	49.4 (podlaskie)	78.1 (śląskie)	64.5	64.3	11.3
	2018	55.8 (podlaskie)	82.1 (śląskie)	72.4	71.8	10.3
Population of rural areas using water supply system in % of total population of rural areas	2008	56.1 (małopolskie)	91.2 (opolskie)	78.1	76.4	11.8
	2018	68.9 (małopolskie)	95.0 (opolskie)	89.0	86.9	9.0
Population of rural areas using sewage system in % of the total population of rural areas	2008	12.0 (lubelskie)	38.9 (zachodnio-pomorskie)	24.4	23.4	35.0
	2018	21.8 (lubelskie)	62.4 (pomorskie)	42.8	41.9	29.4
Population of rural areas using gas supply system in % of total rural population	2008	2.3 (kujawsko--pomorskie)	57.4 (podkarpackie)	9.3	14.5	113.5
	2018	3.9 (opolskie)	61.2 (podkarpackie)	14.4	19.2	87.7
Useful floor area of a dwelling per capita	2008	3.15 (podlaskie)	27.5 (opolskie)	22.9	15.7	71.5
	2018	25.7 (podkarpackie)	33.8 (podlaskie)	28.5	29.1	8.3
Average number of persons per one dwelling	2008	3.14 (łódzkie)	28.5 (śląskie)	3.7	12.8	86.6
	2018	2.79 (podlaskie)	3.61 (podkarpackie)	3.2	3.2	7.6

Source: authors' own study based on data from Statistics Poland.

The changes concerning fitting dwellings in Polish rural areas with water supply and sewage systems, observed in 2008 and 2018, should be assessed positively. During this period, the water and sewage infrastructure was developed systematically (Chmielewska and Zegar, 2020, p. 127). There was a visible improvement in the ratio of the number of inhabitants of rural areas whose dwellings are fitted with sewage system to the number of inhabitants whose dwellings are fitted with water supply system. In 2008, the percentage of the rural population using sewage system was 23.4%, and in 2018 it was higher by 41.9%. On the other hand, water supply network in 2008 was used by 76.2% of rural residents and in 2018 this percentage increased by 10.5%.

Differentiation in the level of rural development in Poland in 2008 and 2018

The classification of voivodeships according to the relative development indicator showed a significant differentiation in the social development of rural areas in Poland. Table 7 presents the results of classifying voivodeships in terms of the level of social development of rural areas in Poland in 2008 and 2018.

In 2008 and 2018, the highest values of the relative measure of development, calculated for the full set of features determining social development of rural areas in Poland, and thus the best positions in the ranking, were observed in the following voivodeships: Śląskie (70.86 and 71.38, respectively), Małopolskie (67.16 and 71.20, respectively:), Pomorskie (58.97 and 58.78, respectively), and Wielkopolskie (58.63 and 58.46, respectively). On the other hand, the group of voivodeships with the lowest level of development in 2008 include: Opolskie (29.75), Warmińsko-Mazurskie (31.83), Podlaskie (32.50), and in 2018: Warmińsko-Mazurskie (21.69), Podlaskie (23.98), and Lubuskie (27.34).

The conducted analysis of the level of social development of rural areas in Poland showed differentiation between the examined voivodeships – the coefficient of variation of the social development indicator in 2008 was 27% and in 2018 it amounted to 36%. Moreover, the relative measure of development calculated for individual voivodeships in 2008 ranged from 29.75 to 70.86, i.e., the difference was 41.11, while in 2018 the corresponding values were from 21.69 to 71.38, respectively (range – 49.69). Increase in the difference between the extreme values of the relative measure of development in 2018, as compared to 2008, indicates a growing scale of spatial differentiation in the level of social development of rural areas in Poland.

The increasing regional differentiation of the level of social development of rural areas in Poland is also indicated by the reference of the relative development indicator established for individual voivodeships to the arithmetic mean of the measures for all voivodeships.

In 2008, the lowest taxonomic measure of social development was 62.8% of the average value, and in 2018 the corresponding indicator was only 49.4%. On the other hand, the standard deviation means that in individual voivodeships

the aggregate measure calculated for the full set of features determining the social development of rural areas in Poland deviates from its average level in 2008 by 12.78283 and in 2018 by 15.700471. Asymmetry coefficients equal to 0.357688 in 2008 and 0.429782 in 2018 mean that for most voivodeships the asymmetric measure is above average, but the strength of this asymmetry is poor.

Table 7

Relative measure of the level of social development of rural areas in Poland and their basic statistical features in 2008 and 2018

Voivodeship	Relative development coefficient (W_i)		Increase (+) / Decrease (–)	Ranking position		Position change in 2018 in relation to 2005
	2008	2018		2008	2018	
Dolnośląskie	39.70	45.25	+	11	7	↑
Kujawsko-Pomorskie	46.28	41.48	–	8	8	–
Lubelskie	42.76	36.29	–	9	10	↓
Lubuskie	38.49	27.34	–	12	14	↓
Łódzkie	50.95	40.36	–	7	9	↓
Małopolskie	67.16	71.20	+	2	2	–
Mazowieckie	55.53	56.53	+	6	5	↑
Opolskie	29.75	35.24	+	16	11	↑
Podkarpackie	56.13	49.73	–	5	6	↓
Podlaskie	32.50	23.98	–	14	15	↓
Pomorskie	58.97	58.78	–	3	3	–
Śląskie	70.86	71.38	+	1	1	–
Świętokrzyskie	41.82	33.34	–	10	12	↓
Warmińsko-Mazurskie	31.83	21.69	–	15	16	↓
Wielkopolskie	58.63	58.46	–	4	4	–
Zachodniopomorskie	36.14	31.93	–	13	13	–
Minimum	29.75	21.69				
Maximum	70.86	71.38				
Range (Dmax-Dmin)	41.11	49.69				
Arithmetic average	47.34375	43.93625				
Standard deviation	12.78283	15.70471				
Asymmetry factor	0.357688	0.429782				
Coefficient of variation	27.00004	35.74432				

Source: authors' own study.

The analysis of the relative value of the social development measure in rural areas shows that in 2018, as compared to 2008, there was an increase in the overall level of social development in five voivodeships (Dolnośląskie, Małopolskie, Mazowieckie, Opolskie, Śląskie), and in the remaining twelve voivodeships there was a decrease. In comparable years, three voivodeships (Dolnośląskie, Mazowieckie, Opolskie) improved their position in the ranking, while seven lowered their position. The changes in the ranking position were relatively small. Only in the Dolnośląskie and Opolskie Voivodeships relatively greater changes were observed (an increase in the ranking position by 4 and 5 positions, respectively).

The analysis of the general level of social development of rural areas in Poland was supplemented with the assessment of partial indicators of the taxonomic measure of development (Table 8). The linear ordering procedure was carried out for four areas, the so-called social components, i.e., demographic potential, education, and the labor market, access to healthcare and infrastructure in 2008 and 2018 (Table 9).

The demographic potential of rural areas in Poland was assessed on the basis of the relative value of the measure established according to five diagnostic features representing this area of social development. The comparison of the relative development indicator in the demographic aspect shows that in 2008 the best demographic potential was observed in the following voivodeships: Małopolskie (77.2989), Wielkopolskie (69.5802), Pomorskie (64.9809), while the lowest was recorded in Opolskie (26,1389), Lubelskie (31.8176), and Podlaskie (36.5886). In 2018, the leading positions in terms of the level of demographic development were taken by the following voivodeships: Małopolskie (80.0722), Mazowieckie (61.0460), and Śląskie (57.7843), while the last positions were taken by Warmińsko-Mazurskie (20.0641), Lubuskie (21.4232), and Zachodniopomorskie (25.7577). In the discussed period, positive changes in the demographic potential were observed in seven voivodeships, similarly there was a regress in seven regions. The most positive changes occurred in Dolnośląskie (six positions up) and Lubelskie (six positions up). The situation deteriorated the most in Lubuskie (a fall by six positions), Łódzkie (a fall by four positions), and Warmińsko-Mazurskie (a fall by four positions). Moreover, in two voivodeships (Małopolskie and Podkarpackie) the position in terms of demographic potential has not changed.

Table 8

Relative measure of social development of rural areas in Poland and its basic statistical characteristics in 2008 and 2018 by social components (from 0 to 100)

Voivodeship	2008				2018			
	Social component				Social component			
	Demographic potential	Education and labor market	Access to healthcare	Infrastructure	Demographic potential	Education and labor market	Access to healthcare	Infrastructure
Dolnośląskie	37.0691	38.5297	46.7836	40.9156	43.4060	45.2344	38.8703	52.6123
Kujawsko-Pomorskie	49.2974	45.9035	51.3888	38.3427	36.8770	44.2687	48.7577	40.5620
Lubelskie	31.8176	62.4143	78.3372	11.0922	35.2546	43.3858	60.3760	12.4785
Lubuskie	49.5072	46.8454	9.5383	28.2785	21.4232	34.6735	7.6633	40.5240
Łódzkie	51.4699	67.0837	76.3984	11.6128	33.3343	56.5967	62.1999	15.8481
Małopolskie	77.2989	61.5321	66.8305	57.9938	80.0722	65.3430	69.2025	65.5734
Mazowieckie	62.5170	57.6779	76.4692	27.0655	61.0460	53.5487	81.4815	36.3274
Opolskie	26.1389	30.1675	14.2107	45.5664	30.8444	37.2436	17.3274	51.8356
Podkarpackie	52.8293	59.8775	33.3591	71.8149	49.1742	36.9060	36.6043	76.5176
Podlaskie	36.5886	37.7205	51.4609	6.0660	26.7105	33.9808	31.3047	1.2146
Pomorskie	64.9809	59.7679	44.7756	57.3342	57.1349	58.0676	48.3203	69.4568
Śląskie	53.0574	90.7680	86.4372	63.6151	57.7843	80.1994	87.4372	71.5604
Świętokrzyskie	51.3954	38.9335	54.6721	21.1480	33.9209	27.4872	47.6270	30.6717
Warmińsko-Mazurskie	38.9145	34.0314	11.4956	30.6616	20.0641	17.9831	9.2593	37.6379
Wielkopolskie	69.5802	72.7762	18.5821	48.2247	57.2317	77.0526	16.7923	63.5148
Zachodniopomorskie	45.8841	14.7344	18.2186	60.3776	25.7577	20.9407	20.0679	64.7581
Minimum	26.13890	14.7344	9.53830	6.06600	20.0641	17.9831	7.66330	1.21460
Maksimum	77.29890	90.7680	86.4372	71.8149	80.0722	80.1994	87.4372	76.5176
Range (Dmax-Dmin)	51.1600	76.0336	76.8989	65.7489	60.0081	62.2163	79.7739	75.3030
Arithmetic mean	49.89665	51.17272	46.18487	38.75685	41.87725	45.80699	42.70573	45.69333
Standard deviation	13.94895	18.82057	26.22562	20.37508	16.95954	18.29481	24.96366	22.72952
Asymmetry coefficient	0.239530	0.126726	-0.021759	-0.077003	0.700583	0.432448	0.256101	-0.487957
Coefficient of variation	27.95568	36.77852	56.78401	52.57155	40.49822	39.93891	58.45507	49.74362

Source: authors' own study.

Table 9

Position of individual voivodeships in the ranking according to the level of social development of rural areas in 2008 and 2018 by social components

Voivodeship	2008				2018			
	Social component				Social component			
	Demographic potential	Education and labor market	Access to healthcare	Infrastructure	Demographic potential	Education and labor market	Access to healthcare	Infrastructure
Dolnośląskie	13	12	9	8	7	7	9	7
Kujawsko-Pomorskie	10	10	8	9	8	8	6	9
Lubelskie	15	4	2	15	9	9	5	15
Lubuskie	9	9	16	11	15	12	16	10
Łódzkie	7	3	4	14	11	5	4	14
Małopolskie	1	5	5	4	1	3	3	4
Mazowieckie	4	8	3	12	2	6	2	12
Opolskie	16	15	14	7	12	10	13	8
Podkarpackie	6	6	11	1	6	11	10	1
Podlaskie	14	13	7	16	13	13	11	16
Pomorskie	3	7	10	5	5	4	7	3
Śląskie	5	1	1	2	3	1	1	2
Świętokrzyskie	8	11	6	13	10	14	8	13
Warmińsko-Mazurskie	12	14	15	10	16	16	15	11
Wielkopolskie	2	2	12	6	4	2	14	6
Zachodniopomorskie	11	16	13	3	14	15	12	5

Source: authors' own study.

Significant multidirectional changes in the relative measure in relation to the demographic potential translated not only into a modification of the ranking position, but also reflected in greater differences in the value of the indicator. The difference between the maximum and minimum value of this measure (range) in 2008 was 51.16, and in 2018 it was 60.0. On the other hand, in 2008, a very weak right-hand asymmetry (asymmetry coefficient=0.24) indicates that for most voivodeships the relative development measure calculated for the features from the social component "demographic potential" is below the average value. Similarly, in 2018, the right-hand asymmetry (asymmetry coefficient=0.70) indicates that for most voivodeships, the development measure calculated for the features from this component is below the average value.

The values of partial indicators calculated on the basis of four diagnostic features describing the labor market and education in 2008 and 2018 show that there was a regression in this area. This is evidenced not only by the decrease in the average value of this indicator for all voivodeships (in 2008 the average value of the measure for education and the labor market in all voivodeships was 51.17, and in 2018 it was 45.80), but also by the fact that in 2018 there were more negative trends marked in a larger number of voivodeships than positive trends, i.e., increased value of this measure.

The ranking of voivodeships in terms of the relative value of the measure of development based on the features defining education and the labor market shows that in 2008 the following voivodeships occupied the highest positions: Śląskie (90.7680), Wielkopolskie (72.7762), and Łódzkie (67.0837), and the lowest – Zachodniopomorskie (14.7344), Opolskie (30.1675), and Warmińsko-Mazurskie (34.0314). On the other hand, in 2018, the following voivodeships were in the lead in the ranking: Śląskie (80.1994), Wielkopolskie (77.0526), and Małopolskie (65.3430), and the lowest in the ranking were the following voivodeships: Warmińsko-Mazurskie (17.9831), Zachodniopomorskie (20.9407), and Świętokrzyskie (27.4872). The difference between the maximum and minimum value of this measure for individual voivodeships was relatively high in 2008 and amounted to 76.03, while in 2018 it was 62.22. Asymmetry coefficients, which amounted to 0.13 and 0.43 in 2008 and 2018, respectively, mean that for most voivodeships, the relative development measure calculated for the features from the "education and the labor market" component is below the average.

The most significant positive changes in the improvement of the education and labor market situation between 2008 and 2018 were observed in seven regions, mainly in Dolnośląskie (five positions up) and Opolskie (five positions up), while the most unfavorable transformations took place in Lubelskie (five positions down) and Podkarpackie (five positions down). Moreover, in three voivodeships (Podlaskie, Śląskie, Wielkopolskie) the situation in this respect has not changed.

Access to healthcare in rural areas in Poland was evaluated on the basis of the measure established based on two diagnostic features. As in 2008, in 2018 the Śląskie Voivodeship was in the most favorable situation in this respect (86.4372 and 87.4372, respectively).

On the other hand, the regions with the least favorable situation in terms of access to healthcare in 2008 and 2018 were the Lubuskie (9.5383 and 7.6633, respectively) and Warmińsko-Mazurskie (11.4956 and 9.2593, respectively) Voivodeships. It should be emphasized that in both voivodeships a decrease in the development measure in this area was recorded in the compared years. In the analyzed period, positive changes in access to healthcare in rural areas were observed in seven regions, mainly in Pomorskie (three positions up). On the other hand, a regression in access to healthcare was observed in four regions, especially in Podlaskie (a decrease by four positions). Importantly, in as many as five voivodeships (Dolnośląskie, Lubuskie, Łódzkie, Śląskie, Warmińsko-Mazurskie) the position in terms of demographic potential has not changed. The range of values of the development measure determining access to healthcare was quite significant in 2008 and 2018 and amounted to 76.8989 and 79.7739, respectively. Left-hand asymmetry (asymmetry coefficient = -0.02) in 2008 and right-hand asymmetry (asymmetry coefficient = 0.26) in 2018 inform that for most voivodeships the development measure calculated for the features of the social component "access to healthcare" is above average.

Infrastructure potential was calculated on the basis of three features describing this development component. The analysis of the relative value of the infrastructure development measure shows that the most favorable potential in this respect in 2008 and 2018 was observed in the following voivodeships: Podkarpackie (71.8149 and 76.5176, respectively) and Śląskie (63.6151 and 71.5604, respectively). On the other hand, the worst results, in terms of infrastructure development, were recorded in 2018, as in 2008, in Podlaskie (6.066 and 1.2146, respectively) and Lubelskie (11.0922 and 12.4785, respectively).

The analysis of the relative indicator of infrastructure development in rural areas in Polish voivodeships in 2008 and 2018 shows slight changes in its level. As many as in ten voivodeships the situation has not changed in this respect. On the other hand, in three voivodeships it increased (Dolnośląskie, Lubuskie, Pomorskie) and decreased (Opolskie, Warmińsko-Mazurskie, Zachodniopomorskie).

The difference between the maximum and minimum value of the infrastructure development measure for individual voivodeships was relatively high and amounted to 65.75 in 2008 and 75.3 in 2018. On the other hand, for most voivodeships, the development measure calculated for the features of the social component "infrastructure" has values above the average (the asymmetry coefficient in 2008 was -0.08 and in 2018 it was -0.49).

When assessing the diversity of social development in rural areas in Poland, it is also justified to examine the relationship between partial measures of individual development components. To investigate the relationship between development measures for individual social components, the Pearson's linear correlation coefficient was calculated (Table 10).

Table 10

Pearson's linear correlation coefficient between relative measures of social development of rural areas in Poland in 2008 and 2018

r-Pearson	2008				2018			
	Demo-graphic potential	Education and labor market	Access to healthcare	Infrasrtuc-ture	Demo-graphic potential	Education and labor market	Access to healthcare	Infrastruc--ture
Demographic potential	1	0.5217[a]	0.2074	0.3999	1	0.7798[a]	0.6323[a]	0.5299[a]
Education and labor market	0.5217[a]	1	0.5890[a]	0.1565	0.7798[a]	1	0.5804[a]	0.3363
Access to healthcare	0.2074	0.5890[a]	1	-0.2318	0.6323[a]	0.5804[a]	1	-0.0148
Infrastructure	0.3999	0.1565	-0.2318	1	0.5299[a]	0.3363	-0.0148	1

[a] statistically important $p<0.05$

Source: authors' own study.

The calculated correlation coefficients indicate the existence of a significant relationship between the measures of social development of rural areas in voivodeships in 2008 and 2018. In 2008, the highest correlation coefficient was obtained between the following components: firstly, "demographic potential" and "education and labor market" (r=0.5217, p=0.0382) and secondly, "education and labor market" and "access to healthcare" (r=0.5890, p=0.0164). On the other hand, in 2018 correlations between development measures are much higher than in 2008. The results in 2018 enable us to draw a conclusion that a high correlation coefficient exists between the indicators describing: the components "demographic potential" and "education and the labor market" (r=0.7798, p=0.0004), "demographic potential" and "access to healthcare" (r=0.6323, p=0.0086), as well as the components "demographic potential" and "infrastructure" (r=0.5299, p=0.0348) and "education and the labor market" and "access to healthcare" (r=0.5804, p=0.0184). Due to a high correlation coefficient, the rankings of voivodeships should be considered consistent.

A multidimensional comparative analysis makes it possible to distinguish groups of voivodeships with a similar level of development. To determine them, the arithmetic mean of relative development measures was used, calculated for individual voivodeships, and the standard deviation of the relative development indicator. On the basis of the relative measure of development, voivodeships were classified into four groups in 2008 and 2018 (Fig. 1 and 2).

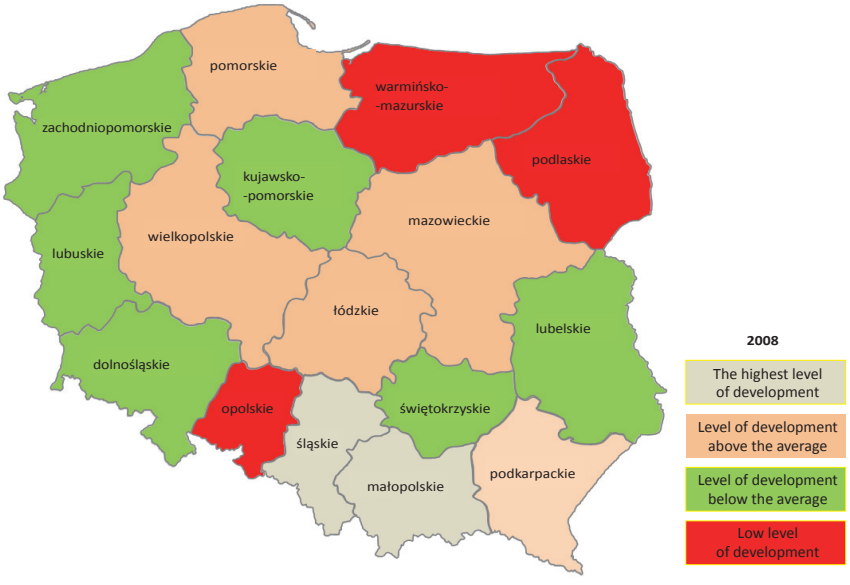

Fig. 1. Grouping voivodeships according to the level of social development of rural areas in 2008.

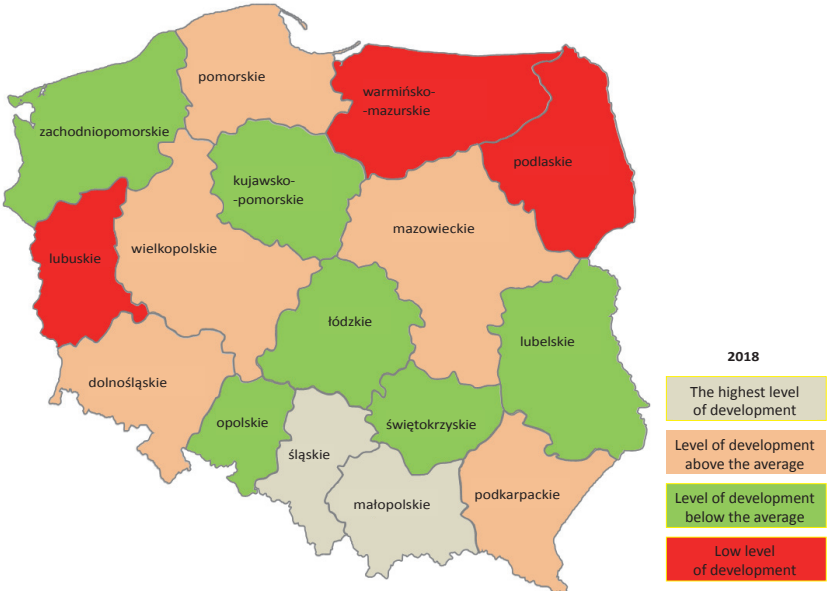

Fig. 2. Grouping voivodeships in terms of the level of social development of rural areas in 2018.

The comparison of the voivodeships according to the level of social development of rural areas shows that both in 2008 and 2018, two voivodeships were classified as regions with a high level of social development: Małopolskie and Śląskie. In the group of regions with a level of social development higher than the average in 2008 and 2018, there were five voivodeships. However, in 2008 and 2018, this group consisted of the same four voivodeships (Podkarpackie, Pomorskie, Mazowieckie, Wielkopolskie). In 2008 this group included the Łódzkie Voivodeship, and in 2018 the Dolnośląskie Voivodeship. The level of social development lower than the average was recorded in 2008 and 2018 in six voivodeships. In 2018, this group included four voivodeships: Kujawsko-Pomorskie, Lubelskie, Świętokrzyskie, and Zachodniopomorskie. Moreover, in 2008 this group also included the following voivodeships: Dolnośląskie and Lubuskie, and in 2018 - Łódzkie and Opolskie. On the other hand, the group of voivodeships with a low level of development in 2008 included Opolskie, Podlaskie, and Warmińsko-Mazurskie, and in 2018 Lubuskie, Podlaskie, and Warmińsko-Mazurskie.

Conclusions

Multidimensionality of the social development of rural areas of Poland in the context of sustainable development means that this issue can be considered from various points of view. When conducting such research, it should be borne in mind that due to their complex nature, the results largely depend on the assumptions made. Quantification of the research area is the basis of a comprehensive analysis, which "encounters" several substantive problems as well as limited availability of statistical data. Therefore, the conducted analysis resulted in the identification (with certain limitations) and the application of measures enabled evaluating the social development of rural areas in Poland in 2008 and 2018 from the perspective of sustainable development.

The initial set of statistical indicators included 29 features, divided into five social components representing various aspects of the social development of voivodeships. After statistical versification, the potential set of features was reduced to 14 indicators included in four components, which were used in the assessment of the social development of rural areas in Poland.

Changes in regions are of a diversified nature, and the search for the leading driving forces is an important issue. The approach to the evaluation of the social development of rural areas used in the study provided the basis for defining the main groups of indicators in shaping such development in individual voivodeships in Poland.

The analyses carried out showed a significant internal differentiation in the level of rural development on the national scale. Research shows that among the indicators describing the demographic potential, the greatest differentiation concerns the birth rate per 1,000 population in rural areas and, alarmingly, this phenomenon is gaining momentum, which may indicate a deepening of unfavorable demographic changes in some rural regions of Poland. Particularly unfavorable demographic

changes in the analyzed period were observed in the Podlaskie Voivodeship, where the highest ageing ratio was recorded in 2018. Similar observations can be noted regarding net international migration in rural areas in total, or net migration in rural areas per 1,000 population. Migration movements contribute even more to the unfavorable age structure of the rural population, as young people are those who migrate most often. The growth of post-working age population is accompanied by a persistently low number of children and youth. Consequently, the demand for healthcare and social security services in rural areas increases, which, together with deteriorating labor resources, causes serious social challenges (Idziak and Wilczyński, 2013).

When analyzing the indices characterizing the labor market in rural areas, it can be noticed that the greatest differentiation between the rural areas of the voivodeships concerned the unemployment rate. The growing diversity in this respect indicates difficulties in implementing the paradigm of sustainable development, and the inhabitants of the areas where this phenomenon has become more intense should be granted special support.

In terms of healthcare, the situation in the individual regions is also very diversified, the best situation in terms of access to doctors and the number of consultations provided was recorded in Mazowieckie. There is an evident problem of unequal access to healthcare resulting from the place of residence. The basic problems include lack of qualified healthcare workers, poor equipment of medical facilities, fewer pharmacies, or financial barriers related to lower income.

Furthermore, in Poland there is a large regional variation in terms of selected elements of infrastructure in rural areas. This applies in particular to two indicators – the percentage of dwellings in rural areas fitted with gas supply system (coefficient of variation is 112%) and the related indicator of the number of rural population using gas supply system in % of the total population of rural areas (coefficient of variation is 113.5%). It should be noted, however, that the differentiation between different regions of Poland in terms of access to infrastructure in 2018 decreased, as compared to 2008, which may be, inter alia, due to the implementation of the specific CAP objective "Improvement of living conditions in rural areas and improvement of their spatial accessibility" of the 2012-2020 Strategy for Sustainable Rural Development, Agriculture and Fisheries.

The positions taken by individual voivodeships in the regional structure of the country were assessed on the basis of the relative development coefficient calculated for the full set of features, as well as the indicators divided into social components. The best positions in the ranking, both in 2008 and 2018, in terms of 14 features, were taken by the following voivodeships: Śląskie, Małopolskie, Pomorskie, and Wielkopolskie.

On the other hand, the final positions in this ranking were taken in 2008 by the following voivodeships: Opolskie, Warmińsko-Mazurskie, and Podlaskie, and in 2018: Warmińsko-Mazurskie, Podlaskie, and Lubuskie. In the next stage of the research, correlation between the measures of development determined for

individual components of the social development of rural areas in Poland was assessed. A significant correlation was found between all measures of social development of rural areas in voivodeships in 2008 and 2018.

The conducted assessment of the level of social development of rural areas in Poland showed differentiation between the studied voivodeships; in 2008 the coefficient of variation of the social development indicator was 27%, whereas in 2018 it accounted for 36%. The research results indicate the necessity to take measures to reduce development disproportions in terms of social aspects in rural areas between better and less developed voivodeships. This is necessary to counteract excluding underdeveloped regions.

It turns out that none of the regions can be regarded as a model example of social development in rural areas. This condition is fulfilled to the greatest extent by rural areas in the Śląskie and Wielkopolskie Voivodeships. Their advantage over other regions results from well-developed indicators in terms of access to healthcare, education, and infrastructure in the Śląskie Voivodeship, as well as the demographic and labor market potential in the Wielkopolskie Voivodeship. The analysis of the coefficient of variation indicates a deepening of the diversification of regions in 2018, as compared to 2008, which means an uneven process of implementing the sustainable development paradigm. On the basis of the conducted research, it can be noticed that the acceleration of social development in rural areas requires a more dynamic shaping of various components in each of the regions of Poland. It is commonly known that rural space is highly complex, e.g., because of an increase in the effective use of local resources in conjunction with the acquisition of external funds, creating a neo-endogenous development mechanism (Adamski and Gorlach, 2007). Thus, both the domestic economic policy (e.g., compensatory subsidies) and the European Union's cohesion policy (in this case its spatial dimension) are conducive to the reduction of regional disparities. The actual processes, however, are the outcome of both this policy and other indicators, which is less recognized (Rosner, 2010). In this context, the analyses of the discussed differences in the development of rural areas are of great importance for shaping the development policy.

References

Adamowicz, M., Dresler, E. (2006). Zrównoważony rozwój obszarów wiejskich na przykładzie wybranych gmin województwa lubelskiego. *Zeszyty Naukowe Akademii Rolniczej we Wrocławiu, Rolnictwo*, LXXXVII, 540, pp. 17-24.

Adamowicz, M., Smarzewska, A. (2009). Model oraz mierniki trwałego i zrównoważonego rozwoju obszarów wiejskich w ujęciu lokalnym. *Zeszyty Naukowe SGGW – Polityki Europejskie, Finanse i Marketing, 1*(50), pp. 251-269.

Adamski, T., Gorlach, K. (2007). Koncepcja rozwoju neoendogennego, czyli renesans znaczenia wiedzy lokalnej. In: K. Gorlach, M. Niezgoda, Z. Seręga (eds.), *Socjologia jako służba społeczna* (s. 137-150). Kraków: Wydawnictwo Uniwersytetu Jagiellońskiego.

Bal-Domańska, B., Wilk, J., Bartniczak, B. (2012), Pomiar postępów województw w kierunku zrównoważonego rozwoju w zakresie zdrowia publicznego. *Econometrics, 3*(37), pp. 83-92.

Barska, A., Jędrzejczak-Gas, J. (2019). Indicator Analysis of the Economic Development of Polish Regions in the Context of the Implementation of the Concept of Sustainable Development. *European Journal of Sustainable Development, 8*(5), 210-210. Retrieved from: https://doi.org/10.14207/ejsd.2019.v8n5p210.

Barska, A., Jędrzejczak-Gas, J., Wyrwa, J., Kononowicz, K. (2020). Multidimensional Assessment of the Social Development of EU Countries in the Context of Implementing the Concept of Sustainable Development. *Sustainability, 12*(18), 7821. Retrieved from: https://doi.org/10.3390/su12187821.

Bennett, K.J., Probst, J.C.,Vyavaharkar, M., Glover, S.H. (2012). Lower Rehospitalization Rates Among Rural Medicare Beneficiares With Diabetes. *The Journal of Rural Health*, 3, pp. 227-234.

Bluszcz, A. (2016). Classification of the European Union Member States According to the Relative Level of Sustainable Development. *Quality & Quantity, 50*(6), pp. 2591-2605.

Borawska, M. (2017). Obszary wiejskie w statystyce publicznej. *Roczniki Kolegium Analiz Ekonomicznych. Szkoła Główna Handlowa*, 44, pp. 275-285.

Borys, T. (2011), Zrównoważony rozwój – jak rozpoznać ład zintegrowany. *Problemy Ekorozwoju – Problems of Sustainable Development, 6*(2), pp. 75-81.

Burny, P., Gaziński, B., Nieżurawski, L. i Sobków, C. (2019). Gospodarka Polski w porównaniu do Unii Europejskiej w świetle wybranych wskaźników rozwoju społeczno-gospodarczego. *Roczniki Kolegium Analiz Ekonomicznych*, pp. 125-141.

Casey, M.M., Thiede Call, K., Klingner, J.M. (2001). Are Rural Residents Less Likely to Obtain Recommended Preventive Healthcare Services? *American Journal of Preventive Medicine*, 3, pp. 182-188.

Chmielewska, B., Zegar, J.S. (2020). Poziom życia na wsi na tle kraju i Unii Europejskiej. In: J. Wilkin, A. Hałasiewcz (eds.), *Polska wieś 2020. Raport o stanie wsi* (pp. 115-138). Warszawa: Wydawnictwo Naukowe Scholar.

Czudec, A., Miś, T., Zając, D. (2018). *Zrównoważony rozwój obszarów wiejskich w wymiarze regionalnym* (*Sustainable Development of Rural Areas in the Regional Dimension*). Poznań: Bogucki Wydawnictwo Naukowe.

Dudek, M., Wrzochalska, A. (2017). Making Development More Sustainable? The EU Cohesion Policy and Socio-Economic Growth of Rural Regions in Poland. *European Journal of Sustainable Development, 6*(3), pp. 189-189.

Firlej, K., Olejniczak, J., Pondel, H. (2019). *Wyzwania rozwojowe obszarów wiejskich*. Warszawa: Wydawnictwo Naukowe Scholar.

Fura, B. (2015). Zróżnicowanie poziomu rozwoju zrównoważonego województw Polski z wykorzystaniem analizy wielowymiarowej. *Nierówności Społeczne a Wzrost Gospodarczy, 44*(1), pp. 108-117.

Gorb, O. (2017). Development of Complex Approach to Defining the Notion "Sustainable Development of Rural Territories". *Forum Scientiae Oeconomia, 5*(2), pp. 87-99.

Guth, M., Borychowski, M. (2017). Zrównoważony rozwój obszarów wiejskich w Polsce w polityce Unii Europejskiej w perspektywach finansowych na lata 2007-2013 i 2014-2020. *Progress in Economic Sciences*, 4, pp. 387-403.

Halamska, M. (2014). Struktura społeczna współczesnej polskiej wsi. Zróżnicowanie regionalne. *Wieś i Rolnictwo, 162*(1), pp. 81-96.

Halamska, M. (2015). Zróżnicowanie społeczne wiejskiej Europy. *Wieś i Rolnictwo, 169*(4), 47-65.

Halamska, M. (2016a). Struktura społeczno-zawodowa ludności wiejskiej w Polsce i jej przestrzenne zróżnicowanie. *Wieś i Rolnictwo, 170*(1), pp. 59-86.

Halamska, M. (2016b). Zmiany struktury społecznej wiejskiej Polski. *Studia Socjologiczne, 1*(220), pp. 38-66.

Halamska, M. (2020). Wieś polska 1918-2018. *W poszukiwaniu źródeł teraźniejszości.* Warszawa: IRWiR PAN, Wydawnictwo Naukowe Scholar.

Idziak, W., Wilczyński, R. (2013). *Odnowa wsi. Przestrzeń, ludzie, działania.* Warszawa: Fundacja Programów Pomocy dla Rolnictwa FAPA.

Jakubowski, A., Bronisz U. (2019). Rural Demographic Problem Areas in Poland. *Zeszyty Naukowe SGGW w Warszawie. Problemy Rolnictwa Światowego, 19*(34)(2), 41-53.

Klóska, R. (2017). Rozwój zrównoważony regionów w Polsce w ujęciu statystycznym. *Progress in Economic Sciences*, 4, 159-175.

Knapik, W. (2014). Wybrane aspekty rozwoju polskich obszarów wiejskich na tle koncepcji zrównoważonego rozwoju oraz zakorzenionych rynków. *Roczniki Naukowe SERiA, 16*(5), pp. 109-113.

Kokoszka, K. (2009). Społeczny wymiar zrównoważonego rozwoju terenów wiejskich. *Journal of Agribusiness and Rural Development, 03*(13), pp. 105-112.

Kołodziejczak, A. (2020). Badania naukowe w zakresie rozwoju obszarów wiejskich w Zakładzie Geografii Rolnictwa i Wsi UAM. *Rozwój Regionalny i Polityka Regionalna*, 50, pp. 63-81.

McKenzie, S. (2004). Social Sustainability: Towards Some Definitions. Hawke Research Institute Working Paper Series 27.

Polna, M. (2020). Przestrzenne zróżnicowanie starzenia się ludności na obszarach wiejskich województwa wielkopolskiego. *Rozwój Regionalny i Polityka Regionalna*, 52, pp. 123-139.

Rosenthal, M., Zaslavski, A., Newhouse, J. (2005). The Geographic Distribution of Physicians Revi-Sited. *Health Services Research*, 40, pp. 1931-1952.

Rosner, A. (2010). *Przestrzenne zróżnicowanie poziomu rozwoju społeczno-gospodarczego obszarów wiejskich a dynamika przemian*. Warszawa: IRWiR PAN.

Rosner, A. (ed.). (2007). *Zróżnicowanie poziomu rozwoju społeczno-gospodarczego obszarów wiejskich a zróżnicowanie dynamiki przemian*. Warszawa: IRWiR PAN.

Siudek, T., Czarnecki, E., Vashchyk, M. (2016). Assessment of the Sustainability of Rural Development in the European Union Member States. *Acta Scientiarum Polonorum. Oeconomia, 15*(3), pp. 101-113.

Stanny, M. (2009). Zróżnicowanie poziomu rozwoju obszarów wiejskich w Polsce a problem realizacji polityki spójności. *Wieś i Rolnictwo, 145*(4), 246-257.

Stanny, M. (2013). *Przestrzenne zróżnicowanie rozwoju obszarów wiejskich w Polsce*. Warszawa: IRWiR PAN.

Stanny, M., Rosner, A., Komorowski, Ł. (2018). *Monitoring rozwoju obszarów wiejskich. Struktury społeczno-gospodarcze, ich przestrzenne zróżnicowanie i dynamika*. Warszawa: Fundacja Europejski Fundusz Rozwoju Wsi Polskiej, IRWiR PAN.

Statistics Poland (2020). *Obszary wiejskie w Polsce w 2018 r.* (*Rural areas in Poland in 2018*). Analizy statystyczne. GUS, Urząd Statystyczny w Olsztynie: Warszawa, Olsztyn. Retrieved from: https://stat.gov.pl/obszary-tematyczne/rolnictwo-lesnictwo/rolnictwo/obszary-wiejskie-w-polsce-w-2018-roku,2,4.html (access date: 25.05.2021).

Stec, M., Filip, P., Grzebyk, M., Pierścieniak, A. (2014). Socio-Economic Development in the EU Member States-Concept and Classification. *Engineering Economics, 25*(5), pp. 504-512. DOI:10.5755/j01.ee.25.5.6413.

Stępniak, M., Wiśniewski, R., Goliszek, S., Marcińczak, S. (2017). *Dostępność przestrzenna do usług publicznych w Polsce*. Prace Geograficzne, 261. Warszawa: Instytut Geografii i Przestrzennego Zagospodarowania im. Stanisława Leszczyckiego, Polska Akademia Nauk.

Ucieklak-Jeż, P., Bem, A. (2017). Dostępność opieki zdrowotnej na obszarach wiejskich w Polsce. *Problemy Drobnych Gospodarstw Rolnych – Problems of Small Agricultural Holdings*, 4, pp. 117-131.

Uglis, J., Jęczmyk, A. (2015). Agroturystyka jako faktor zrównoważonego. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, 379, pp. 57-66.

Walesiak, M., Obrębalski, M. (2017). Spójność społeczna województwa dolnośląskiego w latach 2005-2015 – pomiar i ocena zmian. *Przegląd Statystyczny, LXIV*(4), pp. 437-455.

Wilkin, J. (2018). Czy istnieje teoria rozwoju obszarów wiejskich i czy takiej teorii potrzebujemy? *Wieś i Rolnictwo, 1*(178), pp. 15-32.

Wilkin, J., Hałasiewcz, A. (ed.). (2020). *Polska wieś 2020. Raport o stanie wsi.* Warszawa: Wydawnictwo Naukowe Scholar.

Wojciechowska-Solis, J. (2018). *Assessment of the Economic Development of Regions in Poland Using Multidimensional Comparative Analysis.* Economic and Social Development: Book of Proceedings, Conference in Rome 1-2 March, pp. 121-130.

Wrzochalska, A. (ed.). (2014). Kapitał ludzki w procesach przemian strukturalnych wsi i rolnictwa. Warszawa: IERiGŻ-PIB.

Wyrwa, J., Barska, A., Jędrzejczak-Gas, J., Siničáková, M. (2020). Industry 4.0 and Social Development in the Aspect of Sustainable Development: Relations in EC Countries. *European Research Studies, 23*(4), pp. 1068-1097.

Zegar, J.S. (2012). Rola drobnych gospodarstw rolnych w procesie społecznie zrównoważonego rozwoju obszarów wiejskich. *Problemy Drobnych Gospodarstw Rolnych*, 1, 129-148.

Żmija, D. (2014). Zrównoważony rozwój rolnictwa i obszarów wiejskich w Polsce. *Studia Ekonomiczne*, No. 166, pp. 149-158.

ZRÓŻNICOWANIE POZIOMU ROZWOJU SPOŁECZNEGO OBSZARÓW WIEJSKICH Z PERSPEKTYWY ZRÓWNOWAŻONEGO ROZWOJU WOJEWÓDZTW POLSKI

Abstrakt

Celem artykułu jest ocena stopnia zróżnicowania poziomu rozwoju społecznego obszarów wiejskich w Polsce z perspektywy zrównoważonego rozwoju. Rozwój społeczny to proces wielowymiarowy, dlatego jego pomiar wymagał przeprowadzenia dwuetapowego postępowania badawczego. Pierwszy etap to analiza regionalnego zróżnicowania wartości wskaźników objaśniających rozwój społeczny obszarów wiejskich w Polsce w kontekście realizacji koncepcji zrównoważonego rozwoju w rozbiciu na pięć komponentów społecznych. Etap drugi to wielowymiarowa ocena zróżnicowania rozwoju społecznego obszarów wiejskich w Polsce dokonana za pomocą taksonomicznego miernika rozwoju. Miernik ten pozwolił zarówno uporządkować województwa ze względu na osiągnięty poziom rozwoju społecznego obszarów wiejskich, jak i wyodrębnić grupy podobnych województw. Zakres czasowy analizy obejmował lata 2008 i 2018, natomiast zakres terytorialny objął 16 województw Polski.

Przeprowadzone badania wskazują, że w Polsce występuje duże zróżnicowanie regionalne pod względem rozwoju społecznego obszarów wiejskich. Badania potwierdzają wyrażaną w literaturze przedmiotu tezę o polaryzacji regionalnej. Okazuje się, że żaden z regionów nie może być potraktowany jako modelowy przykład rozwoju społecznego. Uzyskane wyniki badań wskazują na konieczność podjęcia działań w celu zmniejszenia dysproporcji rozwojowych w zakresie aspektów społecznych na obszarach wiejskich pomiędzy województwami lepiej i słabiej rozwiniętymi. Jest to konieczne dla przeciwdziałania wykluczeniu regionów słabo rozwiniętych.

Słowa kluczowe: rozwój zrównoważony, obszary wiejskie, rozwój społeczny, analiza wielowymiarowa.

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