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LEVEL AND DIVERSITY OF HOUSING CONDITIONS OF THE POPULATION OF RURAL MUNICIPALITIES IN THE METROPOLITAN AREA OF POZNAŃ

Key words: housing conditions, living conditions, rural municipalities, rural areas, metropolitan areas, residential functions

ABSTRACT. The main objective of this article is to assess the level and identify occurring differences in the level of housing conditions of the population of rural municipalities in a selected metropolitan area in Poland in 2004 and 2019. The Poznań Metropolitan Area (POM) was analysed. Studies were carried out based on data from the Local Data Bank of Statistics Poland (Polish Central Statistical Office). In the first stage of the study, selected indicators that illustrate the housing conditions of municipalities situated in the POM in comparison with other rural municipalities in the Wielkopolskie Voivodeship were evaluated. In the second part of the study, a synthetic assessment of the level of housing conditions and their changes over time in rural municipalities located in the POM was carried out using the TOPSIS method. As a result of ongoing demographic changes in rural areas around Poznań, associated with the phenomenon of suburbanisation and the change in the functionality of these areas, which perform residential and service functions increasingly often, the level of housing conditions of the population is clearly improving. Better housing conditions distinguish rural municipalities situated in the POM in relation to other rural municipalities outside this area, yet the latter are distinguished by higher dynamics of changes in housing conditions in numerous study aspects.

INTRODUCTION

Low living standards and social inequality have been the subject of social and economic analyses and research for a long time. They are key concepts in social development policy and strategies at European, national and local levels. Housing conditions are one of the most important determinants of the living standard of the population, as indicated, among others, by studies conducted by Agnieszka Kozera [2016], Daniela Špirková et al. [2015], Romana Głowicka-Wołoszyn et al. [2018], and Aleksandra Łuczak and Sławomir Kalinowski [2020].

Housing is a basic element of the material sphere of human life and is one of the most important aspects of the existence and functioning of households. It is one of the most important determinants of human health and quality of life [Braubach, Fairburn 2010, Lejeune et al. 2015]. According to WHO [2013], citizens of European countries spend approximately 90% of their time indoors, including 2/3 of that time in their dwellings. This is because a dwelling provides shelter and a sense of security, satisfying, according to Abraham Maslow's [1970] pyramid of needs concept, the basic needs of the population, without which the full development of higher-order needs is not possible. Indeed, dwelling is a means that facilitates the fulfillment of many higher-order needs of household members, providing a place for work, entertainment, and recreation, especially during the COVID-19 pandemic [Sokołowski et al. 2020]. The inability to meet housing needs at an appropriate level results in housing poverty [Stephens, van Steen 2011, Ulman 2011].

The housing conditions of the population, along with socio-economic development, are improving, but those observed among the population living in rural areas are still worse in relation to the urban population. However, in recent years, and especially in conditions of European integration, the functions performed by rural municipalities have been changing. Many of them, especially those located in close proximity to large cities – regional centers, are changing the nature of their functions from typical agricultural to residential and service functions [cf. Kozera, Wysocki 2015, Stanny et al. 2018]. These processes are significantly influenced by the phenomenon of suburbanisation, i.e. the movement of the population from urban to suburban areas. As a result of this phenomenon, suburban areas are experiencing rapid population growth and the development of economic activity. Consequently, housing resources and conditions of the population living in rural municipalities, which are "dormitories" of large cities, are changing.

Therefore, the main objective of this article is to assess the level and identify occurring differences in the level of housing conditions of the population of rural municipalities in a selected metropolitan area in Poland in 2004 and 2019. The Poznań Metropolitan Area (POM) was analysed. It consists of a total of 22 municipalities, including the municipalities of the Poznań district, as well as the municipalities of Oborniki, Skoki, Szamotuły and Śrem [US Poznań 2021]. Among the municipalities that are part of the POM, seven are rural municipalities, i.e. Czerwonak, Dopiewo, Kleszczewo, Komorniki, Rokietnica, Suchy Las and Tarnowo Podgórne municipality.

RESEARCH MATERIALS AND METHODS

Studies concerning the evaluation of the level and diversity of housing conditions of the population in rural municipalities in the Poznań Metropolitan Area (POM) were carried out on the basis of data from Statistics Poland (Local Data Bank), which were processed using descriptive statistics and taxonomic methods. In the first stage of the study, selected indicators that illustrate the housing conditions of municipalities situated in the POM, in comparison with other rural municipalities in the Wielkopolskie Voivodeship, were evaluated. In the second part of the study, due to the fact that the analysed phenomenon is a complex one (which can be described by means of a number of simple features – partial indicators), in order to conduct a synthetic evaluation of the level of housing conditions and their changes in time, the TOPSIS method was used (Technique for Order of Preference by Similarity to Ideal Solution). This method belongs to the so-called model methods for synthetic meter construction. The idea of this method was introduced by Ching Lai Hwang and Kwangsun Yoon [1981] and, unlike Hellwig's method [1968][1] involves calculating the distance (e.g. Euclidean distance) of the studied objects both from the pattern (A^+) and from the anti-pattern of development (A^-).

The construction of the synthetic measure of the housing conditions of the population in rural municipalities in the POM was performed in five steps. The first stage of the study involved a selection of simple features to be examined. Based on substantive premises, 10 simple characteristics were proposed for the construction of a synthetic measure of the housing conditions level, i.e. the number of dwellings per 1,000 people (x_1), average floor area of a dwelling in m^2 (x_2), average floor area of a dwelling per person in m^2 (x_3), average number of rooms in a dwelling (x_4), as well as the percentage of dwellings equipped with a water supply system (x_5), sewage system (%) (x_6), gas (%) (x_7), flush toilet (%) (x_8), bathroom (%) (x_9), and the percentage of dwellings equipped with a central heating system (%) (x_{10}). After substantive selection, the set of simple features was further verified statistically for their discriminatory ability and information potential. Based on the value of the calculated coefficient of variation, features x_5, x_8 and $x_9$were removed from further study due to very low variability. Next, the inverse matrix of correlation coefficients between them was then determined in order to eliminate features that were overly correlated with each other. Based on the diagonal element analysis of this matrix, feature x_3 and x_4 were excluded from further study. As a result, 5 simple characteristics

[1] The method of linear ordering of objects in a multidimensional feature space, called multidimensional comparative analysis, was proposed in Poland by Zdzisław Hellwig [1968]. This method allows to determine the ranking of objects described in a multidimensional feature space, considering certain ordering criteria. Zdzisław Hellwig defined the necessary concepts, such as stimulants and destimulants, and proposed two variants of the method, i.e., patternless and pattern ordering (considering the „distance" from the developmental pattern).

Table 1. Stages of construction of the synthetic measure of the level of housing conditions of the population using the TOPSIS method in the classical approach

Steps		Description of steps	Calculation formulas
I	Selection of simple features for research	Substantive selection of simple features for research and their verification in terms of statistics	X
II	Normalisation of values for simple features	Using the procedure of zero unitarisation	$z_{ik} = \frac{x_{ik} - \min\limits_i \{x_{ik}\}}{\max\limits_i \{x_{ik}\} - \min\limits_i \{x_{ik}\}}$ for stimulants $z_{ik} = \frac{\max\limits_i \{x_{ik}\} - x_{ik}}{\max\limits_i \{x_{ik}\} - \min\limits_i \{x_{ik}\}}$ for destimulants
III	Determining the coordinates of model objects for the positive ideal and the negative ideal of development	The coordinates of the positive ideal (A^+) and the negative ideal of development (A^-) are determined as maximum and minimum values respectively, in a set of normalised values of simple features	$A^+ = \left(\max\limits_i (z_{i1}), \max\limits_i (z_{i2}), \ldots, \max\limits_i (z_{ik}) \right) = \left(z_1^+, z_2^+, \ldots, z_K^+ \right)$ $A^- = \left(\min\limits_i (z_{i1}), \min\limits_i (z_{i2}), \ldots, \min\limits_i (z_{ik}) \right) = \left(z_1^-, z_2^-, \ldots, z_K^- \right)$
IV	Calculating the distance of each object from the positive and negative ideal of development	Calculating the distance of each assessed *i*-th multiple-feature object from the positive and negative ideal of development with the use of Euclidean distance	$d_i^+ = \sqrt{\sum_{k=1}^{K} (z_{ik} - z_k^+)^2}$ $\quad d_i^- = \sqrt{\sum_{k=1}^{K} (z_{ik} - z_k^-)^2}$
V	Calculating the value of the synthetic measure	With the use of Euclidean distances from the positive (d_i^+) and negative ideal of development (d_i^+)	$S_i = \frac{d_i^-}{d_i^- + d_i^+}$

Source: own study based on [Wysocki 2010]

were considered in the next stage of the study, all of which were found to be stimulants of the level of housing conditions of the population.

In the next stage of the study, the normalisation of simple feature values was carried out using the zeroed unitarisation procedure [Wysocki 2010]. The normalisation procedure was carried out jointly for 2004 and 2019 data (the so-called object-years) to ensure comparability between the obtained study results in the years under consideration. The feature values were then determined for the model units, i.e. pattern and anti-pattern of development, and the Euclidean distances of each evaluated rural municipality from the pattern and anti-pattern of development were calculated on their basis. In the last step, the values of the synthetic feature were calculated based on the calculated distances of the studied objects (municipalities) from the model objects. On this basis, a ranking of rural municipalities in the POM was prepared in terms of the level of housing conditions of the population.

RESULTS OF EMPIRICAL RESEARCH

The need for housing is one of the basic human needs. However, it is being fulfilled on a qualitatively different level [Ulman 2011]. From the perspective of considering the housing situation of the population in rural areas, it is important to assess the status and changes in the housing resources. The National Housing Programme [MIiB 2016], adopted by the government, stipulates that the number of flats per 1,000 residents is one of the measures of achieving its objectives. By 2030, this indicator is expected to reach 435, the European Union average. The data presented in Table 2 show that the number of dwellings per 1,000 inhabitants increased in Poland in the period in question by more than 16%, i.e. from 332.4 in 2004 to 385.9 units in 2019. In 2019, the number of dwellings per 1,000 residents in the Wielkopolskie Voivideship was slightly lower than the average for Poland and amounted to 357.8. While analysing the development of housing resources in rural areas in the analysed region, we can clearly see that the municipalities located in the Poznań Metropolitan Area stand out with a higher level of housing resources. In 2019, the number of housing units in rural municipalities in the POM averaged 352.8 units per 1,000 residents, compared to 284.7 units per 100 residents in other rural municipalities. The dynamics of change in housing resources in rural municipalities in the POM was also higher compared to other rural municipalities in the region, as well as compared to the average in the voivodeship and in Poland. This situation undoubtedly results from the significant increase in the population of rural municipalities located in the analysed metropolitan area. According to research conducted by Joanna Stanislawska and Romana Głowica Wołoszyn [2017], there is a relationship between demographic changes in rural areas around Poznań with the phenomenon of suburbanisation and with the change in the functionality of these areas, which have more residential and service functions than a typical agricultural character.

The standard of dwelling in terms of size and technical condition are important factors that make using a particular dwelling possible and satisfy housing needs. In Poland, real estate prices are relatively high in relation to average wages, so Polish households opt mainly for small flats (usually two- and three-room flats, generally not bigger than 50-65 m^2). Data from Eurostat show that plenty of flats in Poland are overcrowded, i.e. have too few rooms relative to the number of people residing in them (nearly 38% in 2019). This value is very high compared to the rest of Europe, as the European average is slightly over 12% [Eurostat 2021]. In 2019, the average surface area of a flat in Poland amounted to 74.4 m^2, more than 5 m^2 higher than in 2004. A characteristic feature of housing conditions in rural areas is the higher average size of dwellings compared to urban areas, which is due to the fact that most (approx. 80%) of the rural population live in single-family detached houses [Głowicka-Wołoszyn et al. 2021]. In 2019, the average size of an apartment in rural municipalities in the Wielkopolskie Voivodeship amounted to nearly 99 m^2. In contrast, rural municipalities located in the POM were distinguished by a significantly higher average dwelling size of over 109 m^2 (Table 2).

The quality of dwellings and their standard, both in rural and urban areas, is also determined by technical and sanitary facilities, as indicated, among others, by Małgorzata Dolata and Jarosław Lira [2017]. Equipping dwellings with a water supply, sewage system or central heating, among others, makes it possible to meet the basic needs of households. A lack of water supply or central heating does not mean a lack of access to water or heat, yet it lowers the standard of living of such households. In turn, a lack of access to a toilet flushed with water and lack of a bathroom are some of the main factors indicative of housing poverty [Sikora-Fernandez 2018].

The water supply system is the most common utility. The percentage of people using the discussed utility is one of the basic indicators of the living conditions of residents, a measure of the civilization development of the area, as well as its attractiveness for living and, indirectly, of economic development. The rate of increase in the percentage of people with access to the water supply system depends, in turn, on the level of water supply infrastructure saturation in urbanised areas and, above all, on the scale of deficiencies in this field. The study found that more than 92% of the total population had access to a water supply in 2019, a 6.7 percentage point (p.p.) increase compared to 2004. The Wielkopolskie Voivodship, as well as rural municipalities in this region, in general, fared very well in this respect. In 2019, the percentage of the population with access to a water supply system was over 97% in rural municipalities in general in the Wielkopolskie Voivodeship, as well as in those located in the POM. However, a much higher dynamics of change in this regard was observed in rural municipalities located outside the POM, where there was an increase in the percentage of the population with access to a water supply system by 8.6 p.p. (Table 3). An improvement in the provision of water supply infrastructure in rural areas has undoubtedly occurred as a result of Poland's accession to EU structures. As pointed out,

Table 2. Indicators showing the housing resources of the population living in rural municipalities in the Poznań Metropolitan Area (POM) in 2004 and 2019

Specification	Dwelling stock per 1,000 population			Average useful floor area of dwelling			Average number of persons per dwelling			Average useful floor area per 1 person			Average number of rooms in a dwelling		
	2004	2019	change*	2004	2019	change*	2004	2019	change*	2004	2019	change*	2004	2019	change*
Poland	332.3	385.9	116.1	69.0	74.4	107.8	3.0	2.6	86.0	22.9	28.7	125.3	3.7	3.8	103.8
Wielkopolskie Voivodeship	306.9	357.8	116.6	76.2	81.6	107.1	3.3	2.8	85.9	23.4	29.2	124.8	3.9	4.1	102.8
Rural communes in Wielkopolskie Voivodeship. including:	258.0	286.2	110.9	90.9	98.8	108.7	3.9	3.5	89.9	23.6	28.1	119.1	4.3	4.5	104.9
– outside the POM	257.0	284.7	110.8	90.2	98.7	109.4	3.9	3.5	90.2	23.5	28.1	119.6	4.3	4.5	105.6
– located in the POM	291.3	351.8	120.8	99.7	109.1	109.4	3.4	2.8	82.8	29.6	38.2	129.1	4.5	4.6	101.8
– Czerwonak	300.9	322.3	107.1	73.1	83.3	114.0	3.3	3.1	93.4	22.0	26.8	121.8	3.9	4.1	105.4
– Dopiewo	280.7	359.9	128.2	111.6	114.7	102.8	3.6	2.8	78.1	31.3	41.3	131.9	4.7	4.7	99.8
– Kleszczewo	279.9	351.8	125.7	91.2	103.9	113.9	3.6	2.8	79.6	25.5	36.5	143.1	4.1	4.4	107.5
– Komorniki	280.3	365.4	130.4	99.4	98.8	99.4	3.6	2.7	76.8	27.9	36.1	129.4	4.5	4.4	95.8
– Rokietnica	291.3	350.6	120.4	101.8	109.1	107.2	3.4	2.9	83.1	29.6	38.2	129.1	4.5	4.6	101.8
– Suchy Las	329.1	365.5	111.1	99.7	113.7	114.0	3.0	2.7	90.1	32.8	41.6	126.8	4.4	4.7	106.9
– Tarnowo Podgórne	294.1	329.2	111.9	119.0	127.1	106.8	3.4	3.0	89.4	35.0	41.8	119.4	4.9	4.9	101.2

* Dynamics of change 2019/2004 (2004 = 100%)
Source: own elaboration based on [GUS. BDL 2021]

among others, by Małgorzata Dolata and Jarosław Lira [2017], this phenomenon (coupled with intensifying urbanisation processes and the adoption of urban life patterns) changed the character of development in the Polish countryside. Along with the development of the housing function in rural areas, the concentration of residential buildings has become more common, the standard of equipment of dwellings has improved, and expenditure on housing investments related to the settlement of people emigrating from larger cities, especially in suburban areas, have also increased.

By far the greatest changes in rural areas have occurred in terms of the population's access to the sewerage network. In 2019, more than 71% of the total population had access to a sewerage system, which means an increase of as much as nearly 13 p.p. from 2004. The Wielkopolskie Voivodeship is, however, significantly differentiated in terms of the population's access to sewerage systems since as much as 77% of the population uses the network in rural municipalities located in the analysed metropolitan area, while less than 50% of the population does in remaining municipalities. It is noteworthy that the percentage of people using the sewerage system increased by nearly 40 pp in rural municipalities located in the POM, while the average for the region was 15.6 p.p. (Table 3).

In Poland, a very high percentage of dwellings were also equipped with a bathroom and a toilet flushed with water. In 2019, approx. 92% of all housing units were equipped with a bathroom, while approx. 94% were equipped with a flush toilet. In 2019, compared to 2004, the share of households with a toilet increased by 6 p.p. and a bathroom by 5.5 p.p. The housing conditions of households in terms of available bathroom and a toilet flushed with water were similar in Poland and in the Wielkopolskie Voivodeship (the difference in availability of the analysed elements of technical and sanitary installations amounted in 2012 to approx. 2.5 p.p.). Today, a lack of bathroom or toilet in a flat signifies a very low standard of living. In rural municipalities located in the POM, the percentage of households equipped with a toilet in 2019 was 99.3%. and with a bathroom 98.7%, while the average for the Wielkopolskie Voivodeship was 96.3% and 94.1%, respectively. Nowadays, the heating system determines the comfort of life of residents, the operating costs and durability, which translate into quality of life. Ecological considerations are also increasingly important when it comes to heating the house.

Between 2004 and 2019, relatively little change was observed in the extent to which Polish households were equipped with a central heat supply system (an increase by 5.6 p.p.). As a result, 82.8% of households in 2019 were located in centrally heated dwellings. The Wielkopolskie Voivodship was very differentiated in terms of the provision of central heating to the population because approx. 96% of the population used central heating in rural municipalities located in the analysed metropolitan area, while the same applied to 75% of the population in remaining municipalities (Table 2).

The research conducted in the first stage showed the existing differentiation of rural municipalities in terms of housing conditions. More favourable housing conditions

Table 3. Indices illustrating the furnishing of dwellings with selected technical installations in rural municipalities in the Poznań Metropolitan Area in 2004 and 2019

Specification	Percentage of total dwellings equipped with [%]:								
	water supply system			sewage system			gas from gas supply system		
	2004	2019	change 2019/2004 [p.p.]	2004	2019	change 2019/2004 [p.p.]	2004	2019	change 2019/2004 [p.p.]
Poland	85.5	92.2	6.7	58.3	71.2	12.9	51.8	52.9	1.1
Wielkopolskie Voivodeship	91.5	96.6	5.1	56.6	72.2	15.6	44.6	49.8	5.2
Rural communes in Wielkopolskie Voivodeship, including:	88.8	97.1	8.3	24.1	51.4	27.3	0	2.6	2.6
– outside the POM	88.6	97.1	8.6	22.8	49.0	26.2	0	2.1	2.1
– located in the POM	93.4	97.4	4.0	38.1	76.8	38.7	57.4	83.1	25.7
– Czerwonak	91.6	96.5	4.9	67.1	76.8	9.7	63.7	66.2	2.5
– Dopiewo	93.7	99.4	5.7	34.6	89.9	55.3	57.4	88.4	31
– Kleszczewo	87.0	97.4	10.4	21.1	62.0	40.9	37.4	74.2	36.8
– Komorniki	93.4	96.7	3.3	38.1	81.2	43.1	63	99.3	36.3
– Rokietnica	90.6	98.1	7.5	33.3	73.4	40.1	26.9	83.1	56.2
– Suchy Las	95.2	94.9	-0.3	60.0	70.8	10.8	50.9	78.0	27.1
– Tarnowo Podgórne	93.5	99.9	6.4	42.0	99.9	57.9	70.8	90.4	19.6

Source: own elaboration based on [GUS, BDL 2021]

distinguish rural municipalities located in the Poznań Metropolitan Area from other rural municipalities outside this area. Rural municipalities outside the POM were, however, distinguished by a higher rate of change in housing conditions in terms of availability of, for example, a bathroom and central heating in dwellings. However, rural municipalities in the POM are strongly differentiated in terms of the analysed phenomenon. Housing conditions are a complex and multifaceted phenomenon, therefore, in the second stage of research, the diversity of the studied phenomenon in the municipalities in the POM was assessed in a synthetic manner, based on the values of the synthetic measure calculated with the use of the TOPSIS method. They allowed for a linear ordering of the analysed rural municipalities in the selected metropolitan area in terms of the level of housing conditions of the population. The results of the conducted study are showed in Table 5.

The conducted research using the synthetic measure showed an increase in the general level of housing conditions of the population in rural municipalities located in the Poznań Metropolitan Area in 2019, compared to 2004. In 2004, the constructed synthetic measure of the housing conditions of the population ranged from 0.177 for Kleszczewo municipality to 0.531 for Suchy Las municipality. In 2019, the range of its variability was slightly lower and amounted from 0.546 (Czerwonak municipality) to 0.858 (Dopiewo municipality). Thus, the research conducted showed an increase in the overall level of housing conditions of the population in rural municipalities located in the POM, as evidenced by the increase in the average level of the synthetic measure (median). They also indicate a decrease in the differentiation of the analysed municipalities when it comes to the level of housing conditions of the population. The phenomenon is evidenced by the decreasing value of the volatility index for the synthetic measure, which amounted to 35.7% in 2008 and 14.2% in 2019 (Table 5).

Based on the value of the synthetic measure, the rural municipalities of the Poznań Metropolitan Area were arranged in a non-decreasing order and then assigned ranks. In 2019, in relation to 2004, the greatest improvement in the level of housing conditions of the population was observed in the case of Dopiewo municipality (an increase by 4 positions in the ranking). In the case of this rural municipality, in the analysed period, the number of dwellings per 1,000 inhabitants increased considerably. The percentage of the population using the sewerage system grew (by as much as 55 p.p., while the average for the Wielkopolskie Voivodship amounts to 15.6 p.p.), as well as the percentage of dwellings equipped with central heating increased considerably (by as much as 11.2 p.p., while the average for the region amounted to 6.2 p.p.). Consequently, Dopiewo municipality was ranked first among all rural municipalities in the POM in terms of the level of housing conditions. In the last several years, the number of residents in the Dopiewo municipality has doubled, and suburbanisation processes there are among the most intense in the whole analysed metropolitan area (population per 1 km^2 in 2004 was 117, and in 2019 as many as 260). The migration rate for permanent residence per 1,000 residents amounted to

Table 4. Indices illustrating furnishing of dwellings with selected technical and sanitary installations in rural municipalities in the Poznań Metropolitan Area in 2004 and 2019

Specification	Percentage of total dwellings equipped with [%]:								
	flushing lavatory			bathroom			central heating		
	2004	2019	change 2019/2004 [p.p.]	2004	2019	change 2019/2004 [p.p.]	2004	2019	change 2019/2004 [p.p.]
Poland	87.4	93.9	6.5	86.2	91.7	5.5	77.2	82.8	5.6
Wielkopolskie Voivodeship	90.6	96.3	5.7	89.1	94.1	5.0	77.9	84.1	6.2
Rural communes in Wielkopolskie Voivodeship, including:	82.9	92.7	9.8	82.9	88.4	5.5	66.9	76.2	9.3
– outside the POM	82.2	92.3	10.2	82.3	88.1	5.7	66.5	75.1	8.7
– located in the POM	95.6	99.3	3.7	94.3	98.7	4.4	89.4	95.6	6.2
– Czerwonak	96.8	99.3	2.5	95.8	98.7	2.9	89.8	94.4	4.6
– Dopiewo	93.8	99.2	5.4	92.7	98.6	5.9	84.4	95.6	11.2
– Kleszczewo	93.9	98.6	4.7	93.0	97.8	4.8	83.5	93.1	9.6
– Komorniki	95.6	99.5	3.9	94.3	98.9	4.6	89.4	97.1	7.7
– Rokietnica	93.4	98.9	5.5	91.4	97.9	6.5	80.0	93.7	13.7
– Suchy Las	97.1	99.3	2.2	96.3	98.7	2.4	93.3	97.1	3.8
– Tarnowo Podgórne	96.9	99.4	2.5	96.1	98.8	2.7	91.3	96.1	4.8

Source: own elaboration based on [GUS, BDL 2021]

Table 5. Values of the synthetic measure of the level of housing conditions of the population in rural municipalities of the Poznań Metropolitan Area in 2004 and 2019

Specification	2004		2019		Change of position in ranking 2019/2004
	value of synthetic measure	ranking position	value of synthetic measure	ranking position	
Dopiewo	0.352	5	0.858	1	4
Tarnowo Podgórne	0.508	2	0.818	2	0
Suchy Las	0.531	1	0.777	3	-2
Komorniki	0.375	4	0.772	4	0
Rokietnica	0.229	6	0.741	5	1
Kleszczewo	0.177	7	0.660	6	1
Czerwonak	0.403	3	0.546	7	-4
Minimum	0.177	×	0.546	×	×
Median	0.375		0.772		
Maximum	0.531		0.858		
Gap	0.355		0.312		
Volatility coefficient [%]	35,7		14,2		

Source: own elaboration based on [GUS, BDL 2021]

41.6 in the Dopiewo municipality in 2019 and was the highest among all municipalities within the POM (the average for the Wielkopolskie Voivodeship amounted to 0.4, and the average for the Poznań agglomeration was 5.4) [GUS, BDL 2021].

Tarnowo Podgórne rural municipality, both in 2004 and 2019, was classified second in the ranking of rural municipalities in the POM due to the obtained values of the synthetic measure of the level of housing conditions of the population. Tarnowo Podgórne rural municipality was characterised by the highest percentage of dwellings equipped with technical and sanitary installations, i.e. gas, sewerage and a water supply system. This is because Tarnowo Podgórne is one of the richest municipalities in Poland. In the analysed period, the municipality was characterised by a high level of socio-economic development resulting from its favourable demographic situation (positive migration rate for permanent residence per 1,000 residents amounting to 31.3 in 2019), high population density (in 2019, it amounted to 276 people per per 1 km^2) and a high rate of economic activity (the number of national economy entities in the National Business Registry REGON per 10,000 residents of working age was 3,682 in 2019, which was the second highest value among all municipalities in the Wielkopolskie Voivodeship) [GUS, BDL 2021].

The municipality of Suchy Las was ranked first in 2004 and third in 2019 with regard to the level of housing conditions of the population. The municipality was characterised by the largest number of dwellings per 1,000 residents and the largest average floor area per dwelling. Suchy Las rural municipality is also characterised by a high level of socio-economic development, as evidenced by, among others, the highest number of national economy entities in REGON register per 10,000 working-age residents amounting to 4,038 in 2019 in comparison with other municipalities in the Wielkopolskie Voivodship, and the highest level of municipal expenditure per capita (as much as PLN 11,434 in 2019) [GUS, BDL 2021].

The greatest decrease in the level of housing conditions of the population was observed in Czerwonak rural municipality (4 positions down in the ranking). In 2019, the municipality had the lowest value of the synthetic measure and was ranked last. However, the municipality was ranked third in 2004. Czerwonak rural municipality, compared to the rest of the municipalities in the analysed metropolitan area, faced a deterioration in its demographic situation in 2019, as compared to 2004. The migration rate for permanent stay per 1,000 residents was 12.5 in 2004 and only 1.3 in 2019 [GUS, BDL 2021]. This rural municipality had the lowest number of dwellings per 1,000 residents, the lowest average floor area per dwelling, the lowest average dwelling floor area per person, and the lowest average number of rooms per dwelling in 2019. It should be noted, however, that the level of housing conditions in Czerwonak rural municipality continued to be favourable in comparison with other rural municipalities in the Wielkopolskie Voivodship (Tables 2-4).

Moreover, convergence was observed in terms of synthetic ratings of dwellings and their amenities. The lower the municipality's housing conditions rank in 2004, the higher the relative increase in the synthetic indicator value recorded in 2019. The greatest increase in the value of the synthetic indicator was observed in Kleszczewo rural municipality – by approx. 272% (the lowest value of the indicator was recorded in 2004 and amounted to 0.177). The smallest increase in the value of the synthetic indicator, amounting to approx. 35%, was recorded in Czerwonak rural municipality (the indicator was 0.403 in 2004). The process of convergence in terms of synthetic assessment of the level of housing conditions is also evidenced by the values of coefficients of variation for the synthetic measure. In 2004, there was a high variability of the value of the synthetic measure among the analysed municipalities (the coefficient of variation amounted to 35.7%). In 2019, the value of the coefficient of variation for the synthetic measure of the level of housing conditions of the population of rural municipalities in the POM was more than 2 times lower and was less than 15%. This situation is indicative of the average variability of the synthetic assessment of the level of housing conditions in rural municipalities in the POM.

SUMMARY AND CONCLUSIONS

Housing needs are classified as basic needs. However, they can satisfy higher-order needs of household members at the same time. They play a significant role in both social and economic life. Housing conditions are also an essential element in measuring the process of socio-economic development and they relate to phenomena in local and global terms. The processes of shaping the housing conditions of the population in rural areas are diverse, which is influenced by the demographic and economic situation, economic and environmental differences, as well as location in relation to larger metropolitan centres.

On the example of the Poznań Metropolitan Area (POM), it was found that the level of housing conditions of the population is clearly improving in rural areas around Poznań as a result of demographic changes associated with the phenomenon of suburbanisation and changes in the functionality of these areas. Better housing conditions distinguish rural municipalities situated in the POM in relation to other rural municipalities outside this area, yet the latter are distinguished by higher dynamics of changes in housing conditions in numerous study aspects. Moreover, an ongoing process of convergence in the level of housing conditions in rural municipalities in the analysed metropolitan area was observed. The greatest improvement in the level of housing conditions was observed in rural municipalities with the lowest level recorded in 2004.

Rural municipalities in the POM, although distinguished by a higher level of housing conditions in relation to other rural municipalities outside this area in the Wielkopolskie Voivodeship, are still relatively highly differentiated in this regard. As a result of the study, it was found that the highest level of housing conditions of the population in 2019, among the analysed rural municipalities in the POM, was observed in Dopiewo and Tarnowo Podgórne municipalities, located west of the city of Poznań. They were distinguished by, among other things, a high percentage of all dwellings equipped with a toilet, bathroom, and central heating, as well as high housing resources, the highest average dwelling floor area per person, and a high percentage of the population using sewerage systems. These municipalities are relatively most affected by the phenomenon of suburbanisation and are distinguished by a high positive migration rate. In turn, the lowest level of housing conditions of the population was observed in Czerwonak and Kleszczewo rural municipalities, located east of Poznań. In Kleszczowo municipality, this was evidenced by e.g. a very low percentage of the population using sewerage systems and a gas network, as well as a low percentage of dwellings equipped with central heating. Czerwonak municipality has the smallest housing resources and the smallest average usable floor area per dwelling and per person. Kleszczewo municipality is one of the rural municipalities in the POM still characterised by a typical agricultural character and low population density.

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POZIOM I ZRÓŻNICOWANIE WARUNKÓW MIESZKANIOWYCH LUDNOŚCI GMIN WIEJSKICH W POZNAŃSKIM OBSZARZE METROPOLITALNYM

Słowa kluczowe: warunki mieszkaniowe, warunki życia, gminy wiejskie, obszary wiejskie, obszary metropolitalne, funkcje rezydencjalne

ABSTRAKT

Celem głównym artykułu jest ocena poziomu i identyfikacja różnic, występujących w zakresie poziomu warunków mieszkaniowych ludności gmin wiejskich w wybranym obszarze metropolitalnym w Polsce w latach 2004 i 2019. Analizie poddano Poznański Obszar Metropolitalny (POM). Badania przeprowadzono na podstawie danych pochodzących z Banku Danych Lokalnych GUS. W pierwszym etapie badań ocenie poddano wybrane wskaźniki, obrazujące warunki mieszkaniowe ludności gmin wiejskich zlokalizowanych w POM, w porównaniu do pozostałych gmin wiejskich w województwie wielkopolskim. W drugiej części badań przeprowadzono syntetyczną ocenę poziomu warunków mieszkaniowych i ich zmian w czasie w gminach wiejskich zlokalizowanych w POM, z wykorzystaniem metody TOPSIS. W wyniku zachodzących zmian demograficznych na obszarach wiejskich wokół Poznania, związanych ze zjawiskiem suburbanizacji i zmianą funkcjonalności tych obszarów, które pełnią w coraz szerszym zakresie funkcje rezydencjalno-usługowe, wyraźnie poprawia się poziom warunków mieszkaniowych ludności. Korzystniejsze warunki mieszkaniowe wyróżniają zdecydowanie gminy wiejskie zlokalizowane w POM, w relacji do pozostałych gmin wiejskich spoza tego obszaru, jednak te drugie wyróżnia wyższa dynamika zmian warunków mieszkaniowych w wielu badanych aspektach.

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