

IWONA KOPACZ-WYRWAŁ
MIROŚLAW MULARCZYK

Jan Kochanowski University in Kielce

FUNCTIONAL DIVERSIFICATION VS. LIVING STANDARD OF POPULATION IN THE RURAL AREAS OF ŚWIĘTOKRZYSKIE VOIVODESHIP

Abstract: The aim of this paper is to define the relations between the dominating functions of rural areas and the living standards of their inhabitants in the Świętokrzyskie Voivodeship. Answers to the following questions have been sought:

- Which functions dominate in the rural areas of the Świętokrzyskie Voivodeship?
- How diversified are the living standards of the inhabitants of the rural areas in the Świętokrzyskie Voivodeship?
- Is there any relation between the dominating functions and the living standards of the population living in the rural areas of the Świętokrzyskie Voivodeship?

The research included the rural areas of the Świętokrzyskie Voivodeship. All the rural *gminy* (pl. of: *gmina* – the principal unit of territorial and administrative division in Poland) and the rural parts of the urban-rural *gminy* are ranked among them.

The conducted analysis made it possible to observe that in the rural areas of the Świętokrzyskie Voivodeship multifunctional *gminy*, with dominating industrial, residential and tourist functions are characterised by medium living standards, whereas low living standards are observed in *gminy* with dominating agricultural functions.

Key words: Rural areas, living standard, functional diversification.

Introduction

The number of traditional villages, which can be defined from the point of view of their population's occupation, understood as the settlements of people working in agriculture and the services related to it, is constantly decreasing in the contemporary world. Nowadays, inhabitants of rural areas practice various professions. The decrease

in the number of farmers is possible thanks to the application of modern technologies in cultivation and farm animal breeding as well as the transformation of distribution and sales of agricultural products. Many traditional farms have undergone transformation into manufacturing companies, which not only produce agricultural products but also process and sell them. The development of modern means of transport as well as new methods of storage and preservation enable the global trade of agricultural products. It had already been in the 50s of the past century that the issue of depopulating villages was observed in the countries of Western Europe. This process was supposed to be stopped by the promotion of non-agricultural activity. Promotional activity by the supporting of multifunctional development of the rural areas was also undertaken in Poland in the 90s of the 20th century. Engaging a significant part of the inhabitants of the country in non-agricultural occupations resulted in the development of the new functions of the rural settlements. The new functions related to services (such as trade and tourist services) or industrial production as well as residential functions emerge next to the traditional functions, related to agriculture and forestry.

Rural areas' functions have been the subject of geographers' interests for years. The classification of the functions into basic and secondary ones is the most popular. Socio-economic activities whose production are not intended for satisfying the producer's own needs or which serve people not related professionally with a given area influence the basic functions [Bański, Stola 2002]. These functions include agriculture, forestry, industry, services, therein trade, recreation and housing [Bański 2006]. They have a crucial influence on the socio-economic development of a given area. Whereas the secondary functions are influenced by these activities which have been intended for the producer's own needs as well as for the local needs, serving the local population [Stola 1993]. The development of the non-agricultural functions has recently become the most important determinant of the rural areas' transformation [Lewandowski 2002]. It is related to creating new jobs besides agriculture, which contributes to rural areas activation. "A special role is attributed to the emergence of the new and the development of the existing non-agricultural individual businesses, which have become to be a significant element activating the economy and mitigating the social results of the transformation" [Kamińska 2006].

Residential construction is developing as a result of the transformation. Buildings necessary for the new business, such as facilities for tourism management, industrial establishments, are being built. Water supply systems and sewage systems are being expanded and sewage treatment plants are being built. This activity has resulted both in the increase of the income of particular households and gminas (plural of gmina – the principal unit of administrative and territorial division in Poland; translator's note) as well as the improvement of the living standard of the inhabitants. For years it has accounted for a subject of interest of various scientific domains. Despite the significant development of research, there is no terminological arrangement concerning the issue of the standards of living in reference books. The following terms are often

used interchangeably: *living situation, standards of existence, level of living, living standards, social welfare*. However, it is extremely important to distinguish *living situation* (thus the conditions determining the level of satisfaction of needs) from the measures of *living standards* (that is indexes of various types characterising the level of satisfaction of needs in a more or less direct way).

To summarize, two basic approaches of living standards are found in reference books:

- a pragmatic approach, according to which living standard is defined as a level of the population's resources of various goods and services used in everyday life;
- an approach to living standard in the context of needs, which has been presented in this paper, according to which living standard is defined as a level of satisfaction of material, cultural and spiritual needs of a society by the flow of payable goods and services. Bywalec [1985], Szymła [2004] and the above mentioned Liszewski [1995] and Luszniwicz [1972] have represented such an approach in their papers.

The aim of this elaboration is to define the relations between the dominating functions of rural areas and the living standard of their inhabitants in the Świętokrzyskie Voivodeship. The answers to the following questions have been sought:

- which functions dominate in the rural areas of the Świętokrzyskie Voivodeship?
- how diversified is the living standard of the inhabitants of the rural areas in the Świętokrzyskie Voivodeship?
- is there any relation between the dominating functions and the living standard of the inhabitants of the rural areas in the Świętokrzyskie Voivodeship?

The rural areas of the Świętokrzyskie Voivodeship have been the subject of the research. The research included all the rural *gminas* and the rural parts of the rural-urban *gminas*. The total number of 97 administrative units has been analysed. They occupy 11,042 km², which accounts for 94.3% of the area of the Świętokrzyskie Voivodeship. The delimited area is inhabited by 695,757 people, that is 55% of the population of the Świętokrzyskie Voivodeship.

1. Methods applied in the paper

Various measures are applied in the researches on the functional diversification of rural areas. The results of Bański and Stola's [2002] research prove that changes occur in the process of selecting diagnostic features along with social and economic changes taking place in rural areas in the years of systemic transformation. Accessibility to the statistical data is a huge barrier in the selection of the appropriate measures. Taking into account the experience in the functional classification of the rural areas in Poland [Bański, Stola 2002] and in the Świętokrzyskie Voivodeship [Kopacz, Mularczyk 2011; Salomon 2007], the following measures have been adopted for the purposes of the research:

- for the identification of the agricultural functions: share (%) of arable lands in the total area of a gmina, the number of inhabitants who earn their living from agriculture per 1,000 inhabitants;
- for the identification of the tourist functions: forestation rate (%) in relation to the total area of a gmina, the number of accommodations as well as restaurant and catering facilities per 1,000 inhabitants;
- for the identification of the service functions: the number of business entities providing market services per 1,000 inhabitants of working age, the number of people employed in the market service sector per 1,000 inhabitants of working age;
- for the identification of the industrial functions: the number of business entities in the industry per 1,000 inhabitants of working age, the number of the employed in the industry per 1,000 inhabitants of working age;
- for the identification of the residential functions: the commuters per 1,000 inhabitants, the number of the buildings of individual housing construction newly put into use between the years 2000-2009 per 1,000 inhabitants (Tab. 1).

The values of the coefficient of variation expressed as a percentage oscillate between 26 and 158 for the selected features (Tab. 1). The average value amounts to 73. The correlation coefficient between the features selected for calculating each synthetic measure allows to recognize them as independent. Only the features selected for the description of agricultural function are an exception. However, problems with accessibility to other statistical data determined the decision to adopt them for further analysis. Similar features have been applied for describing agricultural functions in the former papers (Bański, Stola 2002; Salomon 2007). Due to this, one can observe that the selected features have both the appropriate spatial variation and significant informative value.

The above indexes accounted for the basis for determining the dominant functions of the rural gminas and the rural parts of the urban-rural gminas in the Świętokrzyskie Voivodeship. The data mostly considered the year 2010 and originates from the Local Data Bank published on the official website of the Central Statistical Office (www.stat.gov.pl). These values do not fully reflect the structure of employment and the number of business entities in the analysed area as they do not include the entities employing less than 9 people. However, they are comparable for all the gminas and it seems that they can serve for analysis. The number of commuters was presented as of 2006. Data collection of the tax system accumulated by the Inland Revenue in the POLTAX data base, disclosed by the Ministry of Finance was the source of information used for the purpose of calculation of the scale and direction of the population migrations related to employment. This data should be treated as estimated. Yet, as it is encumbered with a similar error for all the gminas they can be used for comparison.

Table 1

Statistical characteristics of the diagnostic features determining the functional diversification of the rural areas of the Świętokrzyskie Voivodeship

	Feature	Unit	Average value	Average standard deviation	Average coefficient of variation (%)	Correlation coefficient of the features
agricultural	X ₁ - share of arable lands	%	61.34	17.36	28	0.79
	X ₂ - number of inhabitants who earn their living from agriculture per 1,000 inhabitants	People	107.66	67.21	62	
tourist	X ₃ - forestation rate	%	26.03	18.1	69	-0.03
	X ₄ - number of accommodation as well as restaurant and catering facilities per 1,000 inhabitants	Business entities	0.17	0.17	100	
service	X ₅ - number of business entities providing market services per 1,000 inhabitants of working age	Business entities	28.72	7.63	26	0.17
	X ₆ - number of people employed in market service sector per 1,000 inhabitants of working age	People	16.78	19.7	117	
industrial	X ₇ - number of business entities in the industry per 1,000 inhabitants of working age	Business entities	14.42	6.58	46	0.23
	X ₈ - number of the employed in the industry per 1,000 inhabitants of working age	People	36.93	58.34	158	
residential	X ₉ - commuters per 1,000 inhabitants	People	72.22	26.84	37	0.2
	X ₁₀ - number of the buildings of individual housing construction newly put into use between years 2000 and 2009 per 1,000 inhabitants	Flats	1.27	1.04	82	

Source: Own elaboration.

With regard to the fact that the considered diagnostic features are expressed by various measures, their normalisation has been conducted. The so called Ziolo's [1985] procedure has been applied for this purpose. The percentage share of each synthetic measure describing the rural, tourist, service, industrial and residential functions in the aggregate value has been calculated. As a result of this, it became possible to determine the function dominating in each of the gminas structure. These features whose value of the synthetic measure exceeded the average by at least one standard deviation have been reckoned dominating.

The living standard in the rural areas of the Świętokrzyskie Voivodeship has been expressed by a synthetic index constructed by means of the standardised sums method, the so called Perkal's index, by the application of the six partial features: the total number of deaths per 1,000 inhabitants (‰), the number of students per one computer with access to the Internet for the student's use (primary and secondary junior schools), the number of flats with a bathroom as % of the general number of flats, the number of people using the water supply system as % of the population, the number of people using sewage treatment plants as % of the population, the budget expenditures of the units of local governments in PLN per one inhabitant.

Values of the coefficient of variation expressed as a percentage oscillate between 14.7 and 111.3 in this case, with the average amounting to 41.8 (Tab. 2). Whereas the correlation coefficients between each measures oscillate between -0.35 and 0.32, which, as in the previous case, allows to adopt them for further analysis and reckon the informative value sufficient. The standardised values of the partial measures, which have a destimulating character (measures 1, 2) have been multiplied by (-1) in order to receive the six standardised values directed in the same way for each gmina. Little loss of information during the data aggregation as well as the simplicity and easiness of the calculations are the basic advantages of this method. The partial measures have been selected in such a way so that they have the appropriate informative value about the level of needs satisfaction of the inhabitants of the rural areas in the Świętokrzyskie Voivodeship. The data available at the gminas module of the Local Data Bank of the Central Statistical Office as of 2010 was applied for the selection of the partial measures. The authors are of the opinion that the existing statistical data allows to define the living standard of the people or at least to get the picture of diversification of the level of some social needs satisfaction in the rural areas of the Świętokrzyskie Voivodeship.

Table 2

Statistical characteristics of the diagnostic features determining the diversification of the living standards of the inhabitants of the rural areas in the Świętokrzyskie Voivodeship

	Feature	Unit	Average value	Average standard deviation	Average coefficient of variation (%)
Y_1	total number of deaths per 1,000 inhabitants	‰	12.6	2.67	21.2
Y_2	Number of students per one computer with access to the Internet for student's use (primary and secondary junior schools)	people	18.8	9.54	50.6
Y_3	Number of flats with a bathroom as % of the general number of flats	%	61.6	9.05	14.7
Y_4	number of people using the water supply system as % of the population	%	74.0	17.99	24.3
Y_5	people using sewage treatment plants as % of the population	people	15.8	17.62	111.3
Y_6	budget expenditures of the units of local governments in PLN per one inhabitant	PLN	3510.3	1001.23	28.5

Source: Own elaboration.

2. Diversification of functions of the rural areas in the Świętokrzyskie Voivodeship

Analysis of the standardised deviation from the average percentage share of the diagnostic features in the structure of the synthetic measure, enabling to determine the dominating function of the rural areas in the Świętokrzyskie Voivodeship, allows to observe that it reaches low values (from 2.99 to 19.56) in the majority of cases, which proves the multifunctionality of the analysed areas. Nevertheless, it is possible to determine the dominating functions in the majority of cases. In the Świętokrzyskie

Voivodeship it is most often the agricultural function. It dominates in 31 of the analysed gminas (Tab. 3), which accounts for 33% of all the analysed administrative units. This function has been formed most markedly in the following gminas: Bejsce, Wilczyce, Samborzec, Nowy Korczyn. Mostly the biggest shares of arable lands in these gminas and the number of people who earn their living from agriculture determined that. The gminas with the dominating agricultural function are localised most of all in the southern and Eastern part of the Świętokrzyskie Voivodeship (Fig. 1).

The tourist function dominates in 21 gminas, which accounts for 22% of all the analysed units (Tab. 3). In this case, taking into account the share of the diagnostic features in the synthetic measure, it is most markedly formed in the Wąchock gmina. Both the high number of tourist facilities per 1,000 inhabitants and a high forestry rate have determined that. The share of the diagnostic features in the synthetic measure is not that dominating in the remaining gminy and a big number of tourist facilities per 1,000 inhabitants determined the dominating tourist function.

The residential function dominates in 18 gminas, which accounts for 19% of the total number of the analysed units (Tab. 3). Both the bigger numbers of commuters and the building of individual housing construction newly put into use in relation to the remaining gminas has determined this function. One can observe that these are not only gminas located around the bigger cities of the Świętokrzyskie Voivodeship but also those from which, thanks to the convenient routes, it is possible to commute to work to the big cities outside the voivodeship (Fig. 1).

Thirteen gminas (13% of the analysed units) are characterised by the domination of the industrial function (Tab. 3). It dominates most markedly not only in those gminas where the extractive, mineral and food industry have been developing for years, but also in the gminas in which new industrial mills have been established in the recent years, *e.g.* Tuczepy, where since March 2002 a company of machine industry, Progress Eco S.A., has been developing vigorously.

The service function dominates in three gminas which accounts for 3% of all the analysed units (Tab. 3). The bigger than average number of those employed in the market services per 1,000 inhabitants determined the domination of the service function in these cases.

These administrative units in which no share in the synthetic measure was higher than the average increased by the standard deviation, as well as those in which at least two measures exceeded this value have been reckoned multifunctional units. They accounted for 10% of the total number of the analysed administrative units. The first group included gminas Wojciechowice and Dwikozy, while the other: Chęciny, Gowarczów, Sobków, which can be defined as tourist-residential, Opatów, Gowarczów as tourist-agricultural, Połaniec as service-industrial, Piekoszów as industrial-residential and the rural area of Jędrzejów as agricultural-residential (Tab. 3).



Figure 1. Diversification of the dominating functions of the rural gminas in the Świętokrzyskie Voivodeship

Table 3

**Diversification of the dominating functions of the rural gminas
in the Świętokrzyskie Voivodeship**

Dominating function	Gminas
agricultural	Łagów, Waśniów, Gnojno, Nowy Korczyn, Pacanów, Stopnica, Wiślica, Imielno, Oksa, Słupia (Jędrzejowska), Wodzisław, Bejsce, Czarnocin, Kazimierza Wielka – rural area, Skalbmierz – rural area, Baćkowice, Iwaniska, Lipnik, Sadowie, Działoszyce – rural area, Michałów, Złota, Klimontów, Koprzywnica – rural area, Obrazów, Samborzec, Wilczyce, Zawichost – rural area, Łubnice, Szydłów, Moskorzew
tourist	Bieliny, Bodzentyn – rural area, Daleszyce – rural area, Łopuszno, Nowa Słupia, Raków, Strawczyn, Zagnańsk, Fałków, Słupia (Konecka), Stąporków – rural area, Kunów – rural area, Bliżyn, Wąchock – rural area, Solec Zdrój, Małogoszcz – rural area, Nagłowice, Opatowiec, Łoniów, Bogoria, Włoszczowa – rural area
service (market services)	Ruda Maleniecka, Kije, Osiek – rural area
industrial	Sitkówka Nowiny, Końskie – rural area, Radoszyce, Smyków, Łączna, Suchedniów – rural area, Brody, Tuczępy, Ożarów – rural area, Pińczów – rural area, Oleśnica, Staszów – rural area, Krasocin
residential	Chmielnik – rural area, Górnio, Masłów, Miedziana Góra, Mniów, Morawica, Pierzchnica, Bałtów, Bodzechów, Ćmielów – rural area, Skarżysko Kościelne, Mirzec, Pawłów, Busko-Zdrój – rural area, Sędziszów – rural area, Kluczewsko, Radków, Secemin
multifunctional	Chęciny – rural area, Gowarczów, Sobków, Piekoszów, Jędrzejów – rural area, Opatów – rural area, Tarłów, Połaniec – rural area, Wojciechowice, Dwikozy, Rytwiary

Source: Own elaboration.

3. Diversification of the living standard in the rural areas of the Świętokrzyskie Voivodeship

The synthetic index of living standard in the rural areas of the Świętokrzyskie Voivodeship oscillated between -1.015 in Nagłowice gminia to 1.984 in Sitkówka-Nowiny gminia, when the average amounted to 0.004. Five types of gminas have been distinguished, taking the values of the above index as a criterion (Tab. 4, Fig. 2):

- With a very high living standard, where the synthetic index adopted values exceed 0.901. Five gminas (which accounted for 5.2% of the total number of spatial units) inhabited by 6.5% of the rural population of the voivodeship are included in this group. Four of them, namely Bieliny (where the synthetic index of living standard amounted to 0.985), Morawica (1.158), Sitkówka-Nowiny (1.984) and Strawczyn (1.191) are located in the suburban zone of the capital of the Voivodeship, whereas

Połaniec gminia hosts one of the biggest power plants in Poland. These units have been characterised by a low death rates, the high percentage of people using the water supply system and very high budget expenditures of the local government units per one inhabitant.

- With a high living standard, where the synthetic index adopted values from 0.451 to 0.900. This group is constituted by 11 gminas (which accounted for 11.3% of the general number of the analysed spatial units), which altogether include over 14.7% of the rural population of the Voivodeship. They are located mostly around the biggest cities of the region, that is Kielce, Skarżysko-Kamienna, Starachowice, Sandomierz and along the main routes, namely the 79 route. These units are characterised by a relatively low death rate, the high rate of the flats with a bathroom as well as the high rate of people using the water supply system.

- With a medium living standard, where the synthetic index of living standard adopted values from 0.001 to 0.450. This group has been constituted by 30 gminas (which accounted for 30.9% of the total number of the analysed spatial units), which are inhabited by 31.7% of the rural population of the Voivodeship. These gminas encircle the units from the first and the second group, whereas part of them is located along the main routes of the Voivodeship. They are characterised by the relatively high budget expenditures of the local governments per one inhabitant, while the remaining features oscillate around the average.

- With a low living standard, in which the synthetic index adopted values from -0.449 to 0.000. There are 31 gminas in this group (which accounted for 33.0% of the general number of spatial units), in whose area live 29.4% of the rural population of the Voivodeship. These are units located peripherally in relation to the biggest cities of the region and are characterised by the low rate of people using sewage treatment plants as well as the average levels of the remaining features.

Table 4

The synthetic index of the living standard in the rural areas
of the Świętokrzyskie Voivodeship in 2010

The synthetic index	Number of gminas	Number of people	Structure (%)	
			of gmina	of people
Very high (0,901 and above)	5	45,240	5.2	6.5
High (0,451-0,900)	11	102,302	11.3	14.7
Medium (0,001-0,450)	30	220,667	30.9	31.7
Low (-0,449-0,000)	32	204,772	33.0	29.4
Very low (-0,450 and below)	19	122,776	19.6	17.7
Total	97	695,757	100	100

Source: Own elaboration on the basis of data from the Central Statistical Office (stat.gov.pl).

- With a very low living standard, where the synthetic index adopted values below -0.045 . There were 19 units of this kind (which accounted for 19.6% of the general number of the analysed gminas) inhabited by 17.7% of the rural population of the voivodeship. The lowest values were observed in the gminas located peripherally in relation to the biggest urban centres of the Świętokrzyskie Voivodeship as well as in relation to the main routes. They are characterised by the low and very low values of the analysed features (below the average of the rural areas of the Świętokrzyskie Voivodeship).

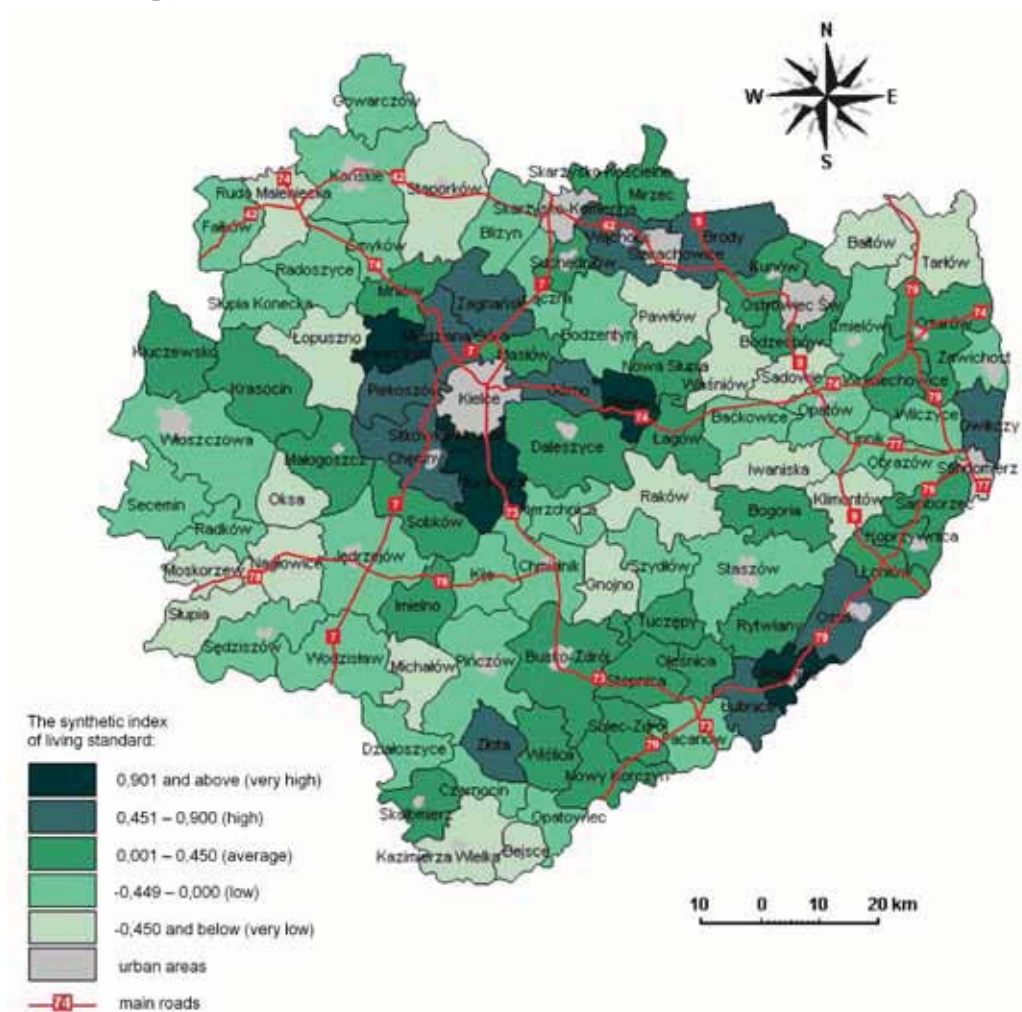


Figure 2. Spatial diversification of the synthetic index of living standards in the rural areas of the Świętokrzyskie Voivodeship in 2010.

Source: Own elaboration on the basis of the Local Data Bank – www.stat.gov.pl.

4. Functional structure vs. the living standards of the inhabitants of the rural areas in the Świętokrzyskie Voivodeship

The average living standard in the rural areas of the Świętokrzyskie Voivodeship is the highest in the multifunctional gminas (average value of the index – 0.228) and in the industrial ones (average value of the index – 0.218) (Fig. 3). The living standard, in the light of the adopted measures, has been reckoned high and very high in four of the 11 multifunctional gminas, medium in three, low in four gminas and only in one gmina very low (Fig. 3).

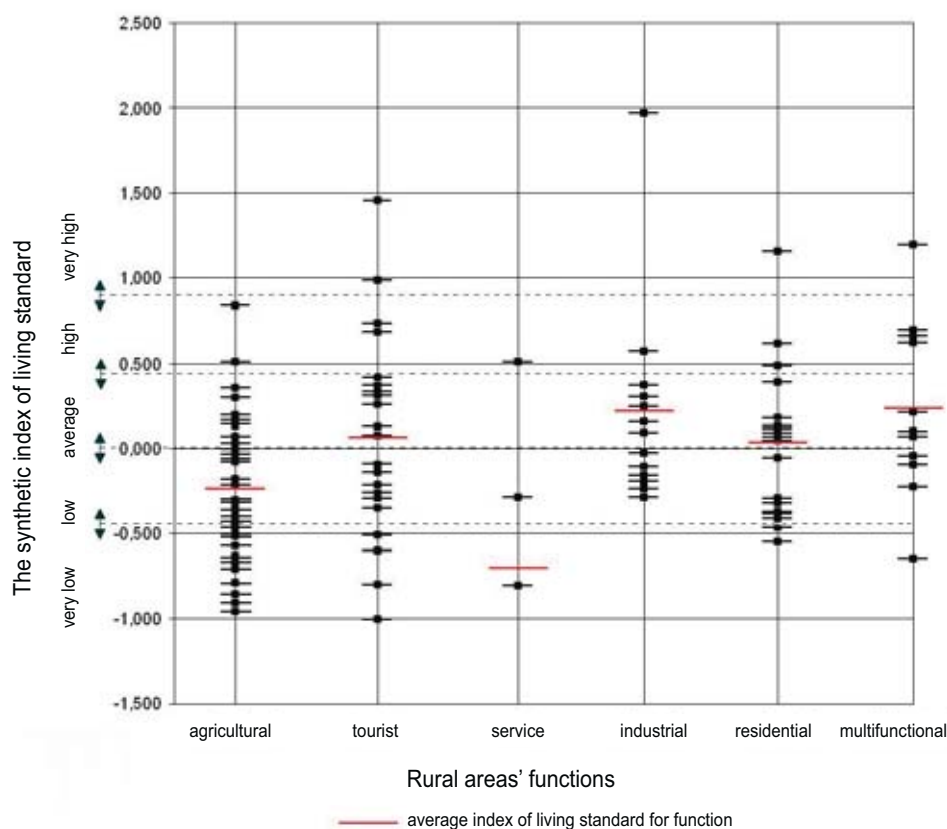


Figure 3. The dominating functions in the rural areas of the Świętokrzyskie Voivodeship vs. the inhabitant's living standard

In the case of the 13 gminas with a dominating industrial function, the standard of living was reckoned high and very high in two of them, average in five, low in six. None of these gminas was found among the administrative units with a very low living

standard (Fig. 3). The not much lower index of the living standard characterises the rural gminas and the rural parts of the urban-rural gminas, in which the tourist (the average value of the index amounting to 0.074) and residential (the average value of the index amounting to 0.048) functions dominate (Fig. 3). The living standard has been reckoned high and very high in four of the 21 gminas, average in seven, low in six, very low in four units (Fig. 3). From among the 18 gminas with a dominating residential function, the living standard is reckoned high and very high in three of them, average in seven, low in six and very low in four units (Fig. 3). The low index of living standard characterises the rural areas of the Świętokrzyskie Voivodeship in which the agricultural functions dominate. From among the 32 rural gminas and the rural parts of the urban-rural gminas, in the light of the selected indexes, the living standard has been reckoned high in two units, average in seven units, low and very low in 23 units. In regard to the small number of gminas with a dominating tourist function, it is difficult to unequivocally interpret the received very low value of the index of living standard. One of the three gminas has been classified in the areas of high, one of low and one of very low living standard (Fig. 3).

Summary

The conducted analysis allow to observe that the rural areas of the Świętokrzyskie Voivodeship are characterised by multifunctional development. However, in the light of the selected measures, the dominating functions can be determined for the majority of the rural gminas and the rural areas of the urban-rural gminas. The biggest group is constituted by the gminas with dominating agricultural functions, another by the administrative units with a dominating tourist function (22%). The residential function dominates in 19%, the industrial function in 13% and the service function in 3% of the total number of gminas. The multifunctional gminas account for 10% of the total number of the analysed spatial units.

The living standard in the rural areas of the Świętokrzyskie Voivodeship shows strong spatial diversification: the values oscillated between -1.015 in Nagłowice gmnia to 1.984 in Sitkówka-Nowiny gmnia, while the average amounts to 0.004. Five types of gminas have been distinguished in the area of the Świętokrzyskie Voivodeship, taking the value of the above index as a criterion: with a very high living standard, with a high living standard, with an average living standard, with a low living standard and with a very low living standard. The highest values occurred in the gminas located around the biggest cities of the region, namely Kielce, Skarżysko-Kamienna, Starachowice, Ostrowiec Świętokrzyski and Sandomierz, whereas the lowest in the areas located peripherally in relation to the biggest urban centres of the Świętokrzyskie Voivodeship as well as in relation to the main routes.

In regard to a small group of the researched gminas, it is difficult to unequivocally determine the relationship between the living standard and the dominating func-

tions (Fig. 3). However, one can observe that in the rural areas of the Świętokrzyskie Voivodeship the average living standard characterises the multifunctional gminas with dominating industrial, residential or tourist functions, whereas a low living standard occurs in those gminas in which the agricultural functions dominate. However, one can observe that in the rural areas of the Świętokrzyskie Voivodeship multifunctional gminas with dominating industrial, residential, and tourist functions are characterized by a higher living standard (defined according to the measures as medium), whereas those with dominating agricultural functions by a lower living standard (according to the measures defined as low).

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