

УДК 33:316(1-21)(438)

DIFFERENTIATION OF SOCIO-ECONOMIC DEVELOPMENT OF MUNICIPALITIES IN ŚWIĘTOKRZYSKIE PROVINCE

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Кусто Б. Диференціація соціально-економічного розвитку муніципалітетів у Свенто-кшиському воєводстві

Представлено методологію і результати оцінки рівня соціально-економічного розвитку муніципалітетів у Свентокшиському воєводстві Польщі за 2006-2010 рр. Для вимірювання зазначеного рівня розвитку використано методуку З. Хелвіга, яка ґрунтується на таксонометричному вимірюванні таких соціально-економічних явищ. Результати аналізу підтверджують велике значення урбанізованих поселень і чинників локалізації населення для розвитку місцевих органів управління. Параметри таксонометричної оцінки рівня розвитку муніципалітетів у 2006 і 2010 рр. (муніципалітет – останній варіант офіційної назви управління місцевої влади) дають змогу владним структурам бачити масштаби диференціації рівня соціально-економічного розвитку регіонів, що знаходяться в їх юрисдикції з тим, щоб приймати адекватні рішення щодо здійснення заходів з їх подальшого розвитку чи його припинення і відповідного закриття місцевого органу влади.

Ключові слова: муніципалітети, місцевий розвиток, таксонометричний метод З. Хелвіга.

Kusto B. Differentiation of socio-economic development of municipalities in Świętokrzyskie Province

The study presents methodology and the results of an assessment of the level of socio-economic development of municipalities in Świętokrzyskie Province in 2006-2010. Z. Hellwig's taxonomic parameter was applied for the measurement of the development level of municipalities. The analysis confirms a great significance of urban settlements and localization factors for the development of local government units. The presentation of a value of the taxonomic parameter of development level in 2006 and 2010 (i.e. the most recent term of office of local government authorities) allows the authorities to be shown the place of the units under their government in respect of the other units at the outset and at the close of their term of office in terms of socio-economic development.

Key words: municipalities, local development, taxonomic method Z. Hellwig.

Кусто Б. Дифференциация социально-экономического развития муниципалитетов в Свентокшиском воеводстве

Представлены методология и результаты оценки уровня социально-экономического развития в Свентокшиском воеводстве Польши за 2006-2010 гг. Для измерения указанного уровня развития использована методика З. Хелвига, основанная на таксонометрическом измерении данных социально-экономических явлений. Результаты анализа подтверждают большое значение урбанизированных поселений и факторов локализации населения для развития единиц местного управления. Параметры таксонометрической оценки уровня развития муниципалитетов в 2006 и 2010 гг. (муниципалитет – последний вариант официального названия управления местной власти) позволяют властным структурам видеть масштабы дифференциации уровня социально-экономического развития регионов, находящихся в их юрисдикции, с тем чтобы принимать адекватные решения об осуществлении мероприятий по их дальнейшему развитию либо его приостановлении и соответственном закрытии местного органа власти.

Ключевые слова: муниципалитеты, местное развитие, таксонометрический метод З. Хелвига.

Introduction. Socio-economic development is a complex issue that encompasses processes occurring in economic, social, political, cultural, ecological and a number of other areas. Despite a multifaceted nature of this issue and resulting difficulties with its measurement, it is essential to be knowledgeable

about a current level of development of a specific territorial unit. Such knowledge, on the one hand, allows local authorities to draw comparisons in a specific area in respect of neighbouring units and, on the other hand, it offers guidelines for a higher-level authorities for decision-making and regional planning [1, p. 67].

The principal objective of the study was to determine a degree of differentiation of municipalities in the Świętokrzyskie Province as regards the level of socio-economic development. The study was carried out in 101 (out of 102) municipalities in Świętokrzyskie Province.

Theoretical grounds of local development.

In the face of transformations that take place in Poland, the issue of socio-economic development gains a special significance. Due to its multi-faceted nature, the category of local development brings about discussions as regards its definition as well as manners and methods of its measurement. There are a number of definitions of local development presented by many authors reflecting a great complexity of this process. It is a consequence of a variety of objectives and internal and external determinants that affect local development. There is a unanimity of views that local development is a process of positive changes comprising both quantitative growth and qualitative transformations in a specific territorial unit. The definition of regional development also includes social development, which can be defined as a process of social transformations in human relations and a social structure of the region (changes in a level and structure of so called human resources, social resources, social infrastructure and an access to facilities and institutions that provide services intended for satisfaction of residents' social needs) [2, p. 232-233]. Social aspects are also reflected in residents' participation in the manner of management, i.e. democratisation of the decision-making process.

T. Kudłacz defines development as a lasting growth of residents' living standard and economic potential on a scale of a specific territorial unit. He equates regional development with changes of its principal components, including business potential, economic structure, natural environment, infrastructural facilities, spatial harmony, residents' living standard [3, p. 16].

Local development can thus be interpreted as a special process which deals with important changes within a municipality and a county, i.e. the local socio-territorial arrangement. It is determined by a variety of factors. Some of them are universal, while others can occur and have an effect only in specific places and at

specific points in time. A number of authors point out that municipal development is locally determined by a location of a municipality (benefits of a location) and a possible rent of location, natural resources and natural environment conditions, importance and nature of agriculture in microregional development, demographic situation and unemployment level, occupational structure and labour qualifications, local community needs, efficiency of rural institutions, including activity of local government and municipal authorities, ownership relations and capital resources, activity of rural community, economy structure, infrastructure condition [4, p. 89-90]. A requisite for local development is interdependence and integrity of all subsystems of development, i. e. economic, social and natural ones in a long-time perspective.

Due to a multi-faceted nature of socio-economic structure, it can only be determined using characteristic measures in order to obtain a synthetic view of the phenomenon subject to study. Aggregate measures which replace a description of studied objects using a group of diagnostic parameters with a description by one aggregate parameter [5, p. 84-88], are often used to describe the level of development. This method allows for the quantification of objects using one number [6, p. 32-33], the ordering of compared objects in terms of a degree of a phenomenon being studied, allows for the interpretation of results and the drawing of comparisons between units. Worth mentioning are taxonomic measures. In this study, Z. Hellwing's taxonomic parameter [7] was used to determine the level of development of municipalities in Świętokrzyskie Province.

To sum up, local development consists in activities aiming at economic and social use of tangible and intangible resources of a given area in a creative, effective and rational way so that conditions can be created for breaking existing obstacles and preventing them from occurrence in a long-term perspective.

Research methodology. The principal objective of the study was to determine a degree of differentiation of municipalities in the Świętokrzyskie Province as regards socio-economic development level in 2006 and 2010. Empirical study was carried out in Świętokrzyskie Province which is ranked as an

economically poor-developed region both on domestic and EU level. The study was carried out in 101 (out of 102) municipalities a county charter, was excluded from the study.

Essential empirical material was obtained from the Provincial Statistical Office in Kielce and Local Data Bank of the Central Statistical Office. The study concerned year 2006 and 2010, which is the most recent term of office of local government authorities. Achievement of the main objective required the use of a relevant taxonomic method. In order to achieve it, Z. Hellwig's taxonomic parameter [7] was used. It is a taxonomic method, in which an aggregate measure is calculated as a synthetic index of taxonomic distance of a specific object from so called development model that is an abstract object (specifically, it can be a real object) [5, p. 84-88]. The Hellwig's development model method allows for the ordering of a collection of objects (municipalities), each of which is described by a collection of diagnostic features with a stimulant or disstimulant nature. In this study, this measure was used for the ordering of municipalities in terms of a level of development they have attained.

The final collection of diagnostic variables used in the research was separated taking account of three types of criteria: content-based, formal and statistical ones [6, p. 32-33]. Ultimately, 12 variables was selected for research: x_1 – total revenue of a municipality for 1 resident [zł]; x_2 – own revenue of a municipality for 1 resident [zł]; x_3 – share of own revenue in total revenue [%]; x_4 – share of investment expenses in total expenses [%]; x_5 – investment expenses of a municipality for 1 resident [zł]; x_6 – secured external funds for 1 resident [zł]; x_7 – number of business registered in REGON Register of Entities in National Economy for 10,000 residents; x_8 – length of water supply piping for an area of 100 km² [km]; x_9 – length of sewage piping for an area of 100 km² [km]; x_{10} – an average usable area of a dwelling unit for 1 person [m²]; x_{11} – number of residents at non-productive age for 100 residents at productive age [%]; x_{12} – unemployment rate

[%]. At the onset of the study, variables were characterised in terms of the direction of influence on the level of development of a phenomenon being studied. A collection of stimulants included the variables: $S = \{x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8, x_9, x_{10}\}$. A collection of disstimulants included the variables: $D = \{x_{11}, x_{12}\}$. Further, P_0 development model was determined; it was defined as an object characterised by the highest values for stimulants and the lowest ones for disstimulants, with standardised coordinates $z_{01}, z_{02}, \dots, z_{0k}$, where:

$$Z_{0k} = \begin{cases} \max \{z_{ik}\} \\ \text{and} \\ \min \{z_{ik}\} \end{cases} \quad \text{when } x_j \text{ is a stimulant}$$

when x_j is a disstimulant.

Subsequently, distances of each object being studied, designated as d_i , from P_0 development model, established in the above manner, were determined:

$$d_i = \sqrt{\sum_{k=1}^K (z_{ik} - z_{0k})^2} \quad (i=1, 2, 3, \dots, N)$$

The resulting variable is not normalised. For that condition to be met, a so called relative taxonomic measure of development is created; it is calculated according to the formula:

$$z_i = 1 - \frac{d_i}{d_o}, \quad (i=1, 2, 3, \dots, N)$$

where: $d_o = \bar{d}_o + 2s_d$

\bar{d}_o, s_d – arithmetic mean and standard deviation of series, respectively d_i ($i=1, 2, 3, \dots, N$);

z_i – synthetic index;

where: $\bar{d}_o = \frac{1}{N} \cdot \sum_{i=1}^N d_i$ and

$$s_d = \sqrt{\frac{1}{N} \cdot \sum_{i=1}^N (d_i - \bar{d}_o)^2}$$

The z_i synthetic measure of development arrived at by calculations assumes, most frequently, values in the interval from 0 to 1. The smaller difference between z_i and 1 is, the less the level of development of P_i object is different from a model object. The value of z_i measure allows for linear ordering based on a distance to a model object of a collection of objects $P_1 \dots, P_m$ from the best to the worst in terms of development of a phenomenon being analysed [6].

Research results. Calculated values of z_i were the starting point for linear ordering of objects (municipalities) as well as separation of their typologic groups. In order to classify municipalities based on the level of development, two parameters of a taxonomic measure were used: \bar{z} arithmetic mean and s_z standard deviation. A collection of objects was divided into four classes:

It means that: municipalities for which $z_i \geq 0,332$ in 2006, and municipalities for which $z_i \geq 0,115$ in 2010, were classified into class I ($z_i \geq \bar{z} + s_z$) with the highest level of development,

– municipalities for which $0,332 > z_i \geq 0,265$ in 2006, and municipalities for which $0,115 > z_i \geq 0,024$ in 2010, were classified into class II ($\bar{z} + s_z > z_i \geq \bar{z}$) with the average level of development;

– municipalities for which $0,265 > z_i \geq 0,198$ in 2006, and municipalities for which $0,024 > z_i \geq -0,067$ in 2010, were classified into class III ($\bar{z} > z_i \geq \bar{z} - s_z$) with the lower level of development;

– municipalities for which $z_i < 0,198$ in 2006, and municipalities for which $z_i < -0,067$ in 2010, were classified into class IV ($z_i < \bar{z} - s_z$) with a very low level of development.

The table shows a ranking of municipalities of Świętokrzyskie Province based on the value of a synthetic measure of development level and

allocation of municipalities to development level classes.

Hellwig's synthetic index in 101 municipalities under study in 2006 is within an interval ranging from 0.532 do 0.172, and from 0.410 to 0.069 in 2010. Municipalities characterised by the highest level of development were classified into Class 1 in 2006 and 2010. In 2006, the Class included 12 municipalities. Three of them, i.e. Ostrowiec Św., Sandomierz, Starachowice, were urban municipalities and they were the biggest business centres except for Kielce. From among the remaining units, 1 was an urban-rural one and 8 were rural ones. The class was dominated by suburban municipalities and local industrial and spa centres, such as Morawica, Sitkówka-Nowiny, Połaniec, Kije, Solec-Zdrój, with Radków Municipality being an exception. In 2010, a number of municipalities in Class 1 was reduced by 2 units, and the list of municipalities was also changed. Two rural municipalities, i.e. Strawczyn and Tuczępy and an urban municipality – Skarżysko-Kamienna, were promoted to Class 1 in 2010. Consequently, 4 urban municipalities, 2 urban-rural municipalities and 4 rural municipalities remained in the Class.

In 2006, 24 municipalities, characterised by an average level of development, including 1 urban one, 9 urban-rural and 14 rural municipalities were qualified to Class 2. In 2010, a number of municipalities in Class 2 increased by 9 units. The Class comprised 33 municipalities, including 11 urban-rural ones and 22 rural ones. These were mainly towns of the region, such as Busko-Zdrój, Suchedniów, Pińczów, Końskie, Staszów, Włoszczowa, Kazimierza Wielka Kamienna, municipalities situated in suburban zones (Miedziana Góra, Masłów, Zagnańsk, Rytwiany, Bieliny) and other municipalities, lying within some distance from bigger towns. Some of them were criss-crossed by main traffic routes.

Taking account of the value of a synthetic index of the level of development, most municipalities, i.e. 56 ones in 2006 and 43 units on 2010, were qualified to Class 3. The majority of them were rural municipalities, 42 and 35 ones in 2006 and 2010, respectively, and 14 and 8 urban-rural ones in 2006 and 2010, respectively. They were both municipalities located at main traffic routes, such as Chęciny, Skarżysko-Kościelne, Jędrzejów, Górnio, Opatów, Iwaniska,

and the ones off main traffic routes and bigger town of the region.

9 rural municipalities in 2006 and 15 ones in 2010 were included in Class 4. Among them, 3 were located at main traffic routes in 2006 (Łączna, Mniów, Baćkowice – National Road No. 7 and National Road No. 74). The other ones

were located off main traffic routes system and bigger town of the region. In 2010, a number of municipalities in Class 4 increased, and the level of development of some units lowered in respect of the others.

Table

Municipalities of Świętokrzyskie Province based on the value of Z. Hellwig's synthetic index in 2006 and 2010 and division of municipalities into classes*

Municipality	Z. Hellwig's synthetic index		Development class	
	2006	2010	2006	2010
1	2	3	4	5
Baćkowice	0,193	0,026	IV	II
Bałtów	0,235	0,050	III	II
Bejsce	0,211	-0,025	III	III
Bieliny	0,275	0,041	II	II
Bliżyn	0,208	-0,074	III	IV
Bodzechów	0,281	0,007	II	III
Bodzentyn	0,224	-0,080	III	IV
Bogoria	0,252	0,114	III	II
Brody	0,295	-0,085	II	IV
Busko – Zdrój	0,325	0,097	II	II
Chęciny	0,213	0,010	III	III
Chmielnik	0,276	-0,010	II	III
Czarnocin	0,224	-0,061	III	III
Ćmielów	0,261	-0,026	III	III
Daleszyce	0,210	0,015	III	III
Dwikozy	0,217	0,073	III	III
Działoszyce	0,216	0,046	III	II
Falków	0,249	-0,077	III	IV
Gnojno	0,231	-0,066	III	III
Gowarczów	0,216	-0,021	III	III
Górno	0,274	-0,015	II	III
Imielno	0,178	-0,070	IV	IV
Iwaniska	0,220	-0,003	III	III
Jędrzejów	0,228	0,012	III	III
Kazimierza Wlk.	0,245	0,028	III	II
Kije	0,532	0,030	I	II
Klimontów	0,206	-0,080	III	IV
Kluczewsko	0,256	-0,069	III	IV
Końskie	0,268	0,045	II	II
Koprzywnica	0,254	-0,005	III	III
Krasocin	0,253	0,103	III	II
Kunów	0,272	0,005	II	III

Municipality	Z. Hellwig's synthetic index		Development class	
	2006	2010	2006	2010
1	2	3	4	5
Oleśnica	0,228	0,025	III	II
Opatowiec	0,193	-0,069	IV	IV
Opatów	0,297	-0,024	II	III
Osiek	0,257	0,031	III	II
Ostrowiec Św.	0,422	0,294	I	I
Ożarów	0,294	0,150	II	I
Pacanów	0,240	0,001	III	III
Pawłów	0,226	-0,020	III	III
Piekoszów	0,277	0,030	II	II
Pierzchnica	0,261	-0,019	III	III
Pińczów	0,292	0,047	II	II
Połaniec	0,360	0,250	I	I
Radków	0,349	0,005	I	III
Radoszyce	0,235	-0,046	III	III
Raków	0,292	-0,069	II	IV
Ruda Maleniecka	0,212	-0,022	III	III
Rytwiany	0,211	0,097	III	II
Sadowie	0,193	0,055	IV	II
Samborzec	0,220	0,013	III	III
Sandomierz	0,469	0,410	I	I
Secemin	0,286	0,039	II	II
Sędziszów	0,260	0,044	III	II
Sitkówka-Nowiny	0,398	0,293	I	I
Skalbmierz	0,250	0,035	III	II
Skarżysko Kam.	0,317	0,196	II	I
Skarżysko Koś.	0,217	-0,055	III	III
Słupia Jędrzejowska	0,203	-0,036	III	III
Słupia Konecka	0,172	-0,122	IV	IV
Smyków	0,250	0,044	III	II
Sobków	0,330	-0,018	II	III
Solec Zdrój	0,334	0,084	I	II
Starachowice	0,477	0,320	I	I

ΑΓΡΑΡΗ ΠΟΛΙΤΙΚΑ: ΔΕΡΧΑΒΝΗ ΡΕΓΥΛΟΒΑΝΝΗ

Lipnik	0,217	-0,060	III	III	Staszów	0,292	0,035	II	II
Łagów	0,324	0,034	II	II	Stąporków	0,212	-0,064	III	III
Łączna	0,191	-0,008	IV	III	Stopnica	0,245	0,079	III	II
Łoniów	0,250	0,068	III	II	Strawczyn	0,303	0,197	II	I
Łopuszno	0,221	-0,079	III	IV	Suchedniów	0,259	0,061	III	II
Łubnice	0,260	0,057	III	II	Szydłów	0,255	-0,013	III	III
Małogoszcz	0,289	0,016	II	III	Tarłów	0,228	-0,080	III	IV
Masłów	0,328	0,071	II	II	Tuczępy	0,235	0,144	III	I

Continue Table

1	2	3	4	5	1	2	3	4	5
Michałów	0,251	-0,007	III	III	Waśniów	0,213	-0,069	III	IV
Miedziana Góra	0,246	0,095	III	II	Wąchock	0,239	0,008	III	III
Mirzec	0,188	-0,089	IV	IV	Wilczyce	0,221	-0,042	III	III
Mniów	0,186	-0,022	IV	III	Wiślica	0,458	-0,010	I	III
Morawica	0,369	0,168	I	I	Włoszczowa	0,267	0,039	II	II
Moskorzew	0,196	0,007	IV	III	Wodzisław	0,208	0,016	III	III
Nagłowice	0,284	-0,072	II	IV	Wojciechowice	0,305	-0,032	II	III
Nowa Słupia	0,254	-0,005	III	III	Zagnańsk	0,257	0,055	III	II
Nowy Korczyn	0,393	-0,013	I	III	Zawichost	0,264	0,006	III	III
Obrazów	0,256	0,017	III	III	Złota	0,381	0,043	I	II
Oksa	0,200	-0,018	III	III					

* *Source: own study.*

The Class with the lowest development level included municipalities lying at provincial roads, such as Raków, Waśniów, as well as peripheral ones, such as Słupia Konecka, Opatowiec, Tarłów.

When doing calculations, detailed changes after 4 years in classification of units in terms of their development were indicated. 49 municipalities remained in the same class of development based on the division using Z Hellwig's method. In the case of 52 municipalities, their development level changed. The change was two-directional, as 25 one (20 rural ones and 5 urban-rural ones) were classified into a class with a lower development level, while 27 ones (1 urban one, 7 urban-rural ones and 19 rural ones) were promoted to a class with a higher development level.

Doing a comparative analysis of the value of the taxonomic development parameter in 2006 and 2010, one takes notice that the highest value was attained by urban municipalities of the region (Starachowice, Sandomierz, Ostrowiec Świętokrzyski, Skarżysko-Kamienna), municipalities located around the city of Kielce (Sitkówka-Nowiny,

Morawica), municipalities with big industrial plants (Ożarów, Kije, Połaniec) or the ones which function as a spa (Solec-Zdrój). Rural municipalities in the region showed the lowest values of a taxonomic development parameter in years subject to analysis. Generally, values of a taxonomic development parameter in 2010 were lower than the ones in 2006.

Summary and conclusions. The study aimed at the determination of the level of socio-economic development of municipalities in Świętokrzyskie Province. Taking advantage of Z. Hellwig's synthetic development index, it was found that the region under study is characterised by diversification in socio-economic terms. Low values of Z. Hellwig's synthetic development index prove a low level of the development of municipalities in the Świętokrzyskie province. It is evident from the analysis that spatial location factors, such as location within an area of influence of bigger towns or location near traffic routes play a significant role. Siting of industrial plants within a municipality or spa units was also important. The biggest economic centres in the region, suburban municipalities and local industrial and spa centres were included in the

class with the highest level of development. The analysis confirms the significance of towns and location factors for the development of a local government unit. Class 2 too includes bigger towns in the region, suburban municipalities and municipalities located at main traffic routes. Peripheral municipalities were classified in Class 4 with the lowest development level, while municipalities with the most beneficial location factors were promoted into a class with a higher development level.

The results are of a synthetic nature and offer a picture of what place a specific municipality occupies in respect of the others, which units are

better than it and what is the distance of a specific unit from the best ones in a specific field. Showing values of a taxonomic development parameter in 2006 and 2010 (the most recent term of office of local-government authorities) allows for these authorities to be shown the place of units that they are in charge of in terms of socio-economic development in relation to the other units at the onset and at the close of the term of office. Such information allows the authorities that are in charge of efficient operation of a municipality and set directions of its further development to realise a number of problems that still require to be solved and reveal issues that are neglected.

LITERATURE

1. Jurczak R. *Zróżnicowanie rozwoju społeczno-gospodarczego gmin wiejskich województwa wielkopolskiego* / R. Jurczak // *Społeczno-ekonomiczne aspekty rozwoju polskiej wsi*. – Warszawa : IRWiR PAN, 2007. – S. 67.
2. Kosiedowski W. *Zarządzanie rozwojem regionalnym i lokalnym* / W. Kosiedowski // *Gospodarka regionalna i lokalna*. – Warszawa, 2008. – S. 232-233.
3. Kudłacz T. *Programowanie rozwoju regionalnego* / T. Kudłacz. – Warszawa : PWN, 1999. – S. 16.
4. Kudłacz T. *Zróżnicowanie gmin pod względem poziomu rozwoju społeczno – gospodarczego w regionie rzeszowskim, [w:] Prace z zakresu gospodarki regionalnej* / T. Kudłacz, M. Grzebyk // *Zeszyty Naukowe nr 558, AE w Krakowie*. – Kraków, 2002. – S. 89-90.
5. Nowak E. *Metody taksonomiczne w klasyfikacji obiektów społeczno-gospodarczych* / E. Nowak. – Warszawa : Państwowe Wydawnictwo Ekonomiczne, 1990. – S. 84-88.
6. Strahl D. *Metody oceny rozwoju regionalnego* / D. Strahl. – Wrocław : Wydawnictwo Akademii Ekonomicznej im. Oskara Langego, 2006. – S. 32-33.
7. Hellwig Z. *Zastosowanie metody taksonomicznej do typologicznego podziału krajów ze względu na poziom ich rozwoju oraz zasoby i strukturę wykwalifikowanych kadr* / Z. Hellwig. – Warszawa : Państwowe Wydawnictwo Naukowe, 1968.

