ANALYSIS OF SOCIAL AND SPATIAL ACCESSIBILITY OF EDUCATIONAL SERVICES IN THE MUNICIPALITIES OF PŁOCK DISTRICT

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ABSTRACT

The issue addressed in the present paper deals with spatial accessibility of the basic public education services, which is an important element determining the level of social development of a region and the quality of life of the residents. The current relevance of the topic is realated to the the amendments to the Act on Educational Law of December 14, 2016 introducing the liquidation of junior high schools and the return to 8-year primary schools. The designated study objects were the municipalities located around the Płock city hub. According to the National Strategy for Regional Development 2010–2020, these administrative units belong to the areas with high concentration of negative socio-economic phenomena, with low accessibility of public services, including educational services for residents, especially those in rural areas. In the study, a multi-index analysis based on spatial information from Local Data Bank (BDL) and Database of Topographical Objects (BDOT) was applied. Residential development areas and residential buildings located in the districts serving educational facilities were generated using the ArcMap software, which facilitated the determination of accessibility parameters. The results obtained from the performed analysis made it possible to present the diversification in the access to educational services in the municipalities of Płock district, and to determine the problem areas. The spatial approach to issues of social accessibility may also have a practical aspect for local governments, which make decisions on transforming junior high schools into primary schools, and which determine the location of new educational facilities.

Keywords: spatial accessibility, primary school, municipality, spatial planning

INTRODUCTION

The educational infrastructure is one of the basic elements making up the system of facilities and institutions that guarantee equitable living conditions in the living environment (Siemiński, 1992; Chmielewski, 2001). A well-developed social infrastructure favours the proper development of almost all areas of economic and social life. On the other hand, the shortcomings of such infrastructure cause a decrease in the attractiveness of residing in a given area, which in turn intensifies the migration of people who are looking for better opportunities for their own development (Tabor, 2011; Wasiluk, Wojsławowicz, 2013).

The implementation and functioning of educational institutions results from the endogenous, own functions of the given municipality, which should be fulfilled as well as possible. Of course, the achievement of satisfactory service level for residents in terms of educational services is related to the changing regulations in the Act on the education system. In recent years, the situation regarding the age of children who could start learning in the first grade, as well as the type of institutions implementing the basic level of education, has been developing dynamically. From 1 September

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1999, the reform of the education system led to the transformation of the two-tier school system in force since 1968 into a three-cycle structure (Dz.U. 1998 No. 117, item 758 and 759). In the years 1999–2001 this had caused the expiration of eight-year primary schools, and the emergence of three-year junior high schools. In addition, in April 2009, the governmental amendment to the Act on the education system came into force, which gave the 6-year-olds the right to study at school, and guaranteed access to pre-school education to 5-year-old children (Dz.U. 2009 No. 56, item 458). On the other hand, the Act of 29 December 2015 lifted the schooling obligation of 6-year-olds (Dz.U. 2016, item 35). After 17 years of the functioning of junior high schools ("gymnasium"), the decision was made to return to the 8-grade high school (Dz. U. 2017 item 59, 949, 2203). This forces municipal authorities to face some difficult decisions, namely, which of the junior high schools are to be closed, and which will of them be transformed into primary schools. These changes will affect the spatial accessibility of educational services in various parts of municipalities.

PURPOSE AND RANGE OF THE STUDY

The cognitive goal of the work is to determine the socio-spatial accessibility of educational services in the municipality after returning to the 8-grade system of primary school education and liquidation of junior high schools. Two theses have been put forward:
- the socio-spatial accessibility of education services for the residents of the municipalities within the Płock district is of a good standard;
- the level of diversification of educational service provided within the municipalities of the Płock district is inseparably linked with their distance from the city of Płock.
- The spatial range of the study encompasse the Płock district, which includes:
- three urban-rural municipalities: Drobin, Gąbin, Wyszogród;
- twelve rural municipalities: Bielsk, Bodzanów, Brudzeń Duży, Bulkowo, Łąck, Mała Wieś, Nowy Duninów, Radzanowo, Słubice, Słupno, Stara Biała, Staroźreby.

The argument for the selection of the research area was based on the inclusion of municipalities concen-

trated around the hub that is Płock town among the areas of high concentration of negative socio-economic phenomena, including ineffective education system with a low level of accessibility of public services to inhabitants, especially those in rural areas (Legutko 2014; Krajowa Strategia ... 2010).

We can assume that the presented analysis concerns the current situation, because data on the population were obtained for the year 2016, while the data related to educational institutions were obtained for the year 2017.

RESEARCH METHODOLOGY

The research was based on a multidimensional comparative analysis using selected indices of sustainable development in relation to the accessibility of public services. It currently plays an important role in the economic and spatial information system, being a widely used tool (Rosner, 2007; Witkowski and Starościc, 2008; Borys, 2010; Kapusta, 2012; Rakowska, 2013).

The following research stages were applied in the present work, consisting of:
- filtering of data collected in the Local Data Bank (BDL), based on the features contained in the field of Population and Education;
- setting the indices for the aforementioned features, in order to obtain their comparability;
- generating spatial information in the form of thematic layers concerning the location of educational facilities, residential areas, single- and multi-family residential buildings based on the Topographic Data Database (BDOT) for the Płock district, and elaborating these using ArcGis software; whereas spatial information Geoportal 2 tool was used in order to locate individual objects and address data placed on the websites of the municipalities subjected to the analysis;
- normalization of indicators, in order to determine their importance in securing the implementation of educational services within the municipality;
- determination of the synthetic index, and determination of border intervals.

The possibilities of evaluating the quality and accessibility of educational services are widely discussed in the subject literature. In terms of methodology, they are most often referred to as educational system indi-

cators, understood as synthetic, simplified information about the school system, always in numerical form, obtained either on the basis of reporting and budget data, or on the basis of data collected specifically for the needs of a given indicator, obtained from BDL or SIO (Educational Information System). There can be an infinite number of such indicators. They can be subdivided according to the area of activity, or the relevant entity related to the organization of the school, the teaching process, the functioning of the staff, and the financing of education (Herczyński, 2012). On the basis of specific sets of indicators, analyses of the accessibility of public services for many parts of Poland have been conducted (Czapiewski and Janc, 2012; Strzelecki et al., 2013; Feltynowski, 2013).

An unquestionable advantage of the analysis presented herein is the use of an unusual set of indicators. The following features were used for the assessment of the level of socio-spatial accessibility to educational services:

- the number of primary schools in general – L_{sp} [units], related to:
  - the number of population aged 5–14 according to the actual place of residence – $L_{m5\text{-}14}$ [person], which specifies the index of relative social accessibility (X_1);
  - surface area of the municipality (P_g) – relative density index (X_2);
  - size of residential areas (P_{tzm}) – absolute surface area index (X_3);
- the sum total of the areas covered by primary school service per 3 km radius (P_{ro}) as, and in reference thereto:
  - the size of residential areas located within the radius of educational services (P_{tzmo}) – the index of relative spatial accessibility of education services (X_4),
  - the number of single-family and multi-family housing buildings located within the radius of education services (L_{bmo}) – the index of the absolute accessibility of educational services (X_5);
- the size of residential areas within the limits of serviced districts (P_{tzmo}) to the total size of residential areas (P_{tzm}) – the index of the effectiveness of spatial services in the education sector (X_6);
- the number of single-family and multi-family housing buildings within the limits of service (L_{bmo}) to

the total number of residential buildings (L_{bm}) – the rate of service efficiency of education services (X_7).

The next stage of the work on the variables was normalization, which allowed for transforming the values of particular variables expressed in different units into a comparable form. Due to the fact that all variables are of a stimulant character, the Perkal method has been used in statistical normalization:

$$Z_{ij} = \frac{x_{ij} - \bar{x}}{S_j}$$

where:

Z_{ij} – normalised value of the j–th characteristics for the i–th item,

X_{ij} – the value of the j–the characteristics for the i–th municipality,

$X_{śr}$ – arithmetic mean of the value of the j–th characteristics,

S_j – standard deviation of the value of the j–th characteristics.

The overall picture of the accessibility of educational services at the basic level of municipalities in the 2019 perspective was made using the synthetic Perkel index (Runge, 2007), in the following form:

$$W_{DSPUO} = \frac{1}{n} \sum_{j=1}^{n} z_{ij}$$

where:

W_{DSPUO} – synthetic index of socio-spatial accessibility of municipal educational services;

j – 1,2, ..., n;

z_{ij} – normalised value of x_{ij}

n – the numer of characteristics taken into account.

A higher value of the synthetic index means a higher degree of socio-spatial access to educational facilities in the administrative unit. Values close to 0 indicate an average situation, whereas negative indicators will represent those municipalities in which some aspects of accessibility to educational services are inadequate. On the basis of the spread of synthetic index values, the W_{DSPUO} diversification scale in municipalities was determined.

CHARACTERISTICS OF SOCIO-SPATIAL ACCESSIBILITY OF EDUCATIONAL SERVICES

School location data were taken from the resolutions of Municipal Councils in the analysed territorial units referring to the adaptation of the network of school units to the current education system. They were spatially generated using the BUBD15 layer of buildings and structures, and confirmed using the tool of Geoportal 2. The location of educational facilities and their service districts, against the background of residential buildings, is presented in Figure 1.

Numerical data on the characteristics of the conditions for the accessibility of educational services in accordance with the data contained in the Local Data Bank and the Topographic Data Base are presented in Tables 1 and 2.

In the next stage of the analysis, the indicators were normalized by calculating the Z_{ij} value (see:

Table 3), using the average values and standard deviations for individual indicators, which were respectively as follows:

- index of relative social accessibility (X_1): $X_{śr} = 0.451128$, $S_{X1} = 0.150943$;
- relative density index (X_2): $X_{śr} = 0.029427$, $S_{X2} = 0.00948$;
- absolute surface area index (X_3): $X_{śr} = 0.910482$, $S_{X3} = 0.253919$;
- the index of relative spatial accessibility of educational services (X_4): $X_{śr} = 0.373823$, $S_{X5} = 0.103012$;
- the index of the absolute accessibility of educational services (X_5): $X_{śr} = 0.21505$, $S_{X6} = 0.069767$;
- the index of the effectiveness of spatial services in the education sector (X_6): $X_{śr} = 0.681425$, $S_{X7} = 0.134181$;
- the rate of service efficiency of educational services (X_7): $X_{śr} = 0.715849$, $S_{X8} = 0.138211$.
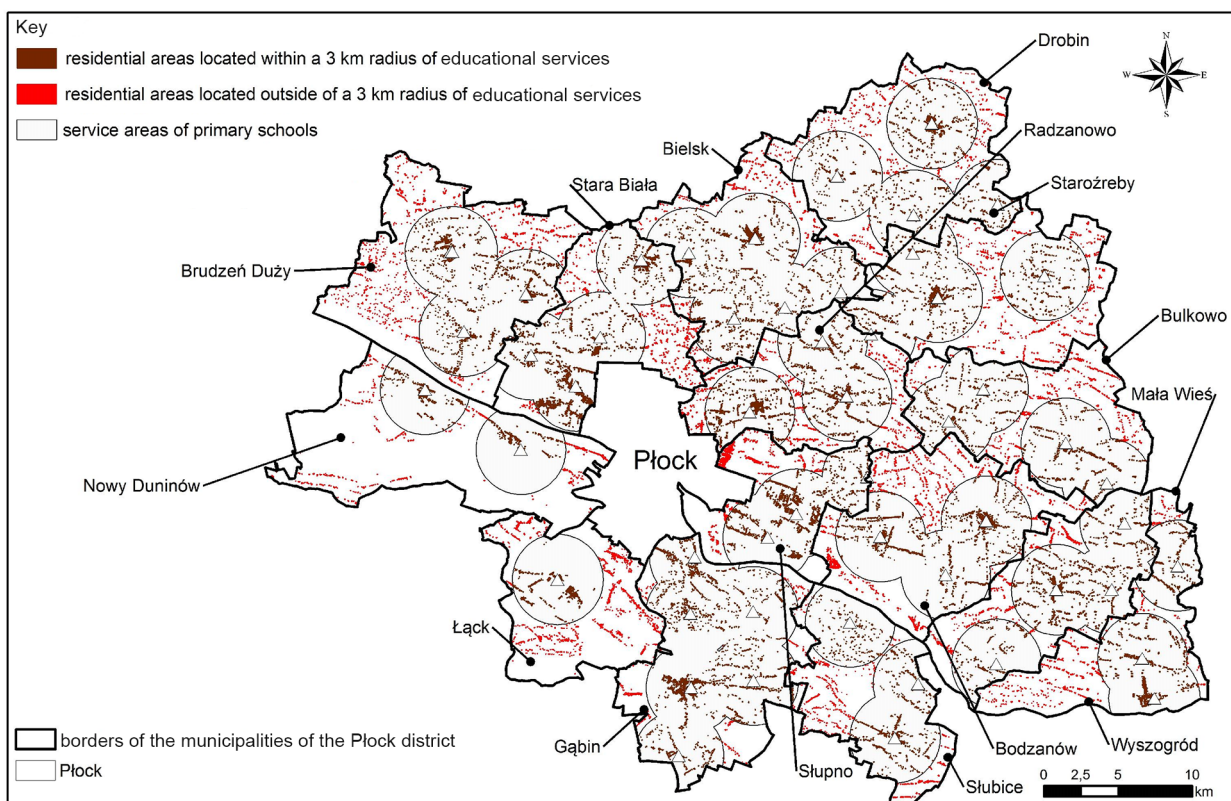

Fig. 1. Location of primary schools in relation to residential areas, including areas within a 3 km radius for the municipalities of Płock district

Source: own study

Table 1. Demographic, educational and area-size characteristics in the municipalities of Płock district (on the basis of data provided by the BDL and BDOT)

Municipality	P_g [km²]	L_m [pers.]	L_{m5-14} [pers.]	L_{sp} [units]	P_{tzm} [km²]	P_{tzmo} [km²]	P_{ro} [ha]	L_{bm} [units]	L_{bmo} [units]
Bielsk	125.17	9114	1 024	5	4.319	3.515	9468.48	2333	2040
Bodzanów	136.35	8284	824	3	4.692	2.801	7734.78	2637	1683
Brudzeń Duży	159.84	8233	941	3	4.463	2.748	7667.27	2301	1528
Bulkowo	116.93	5726	616	4	3.369	2.327	7729.31	1426	1023
Drobin	143.5	8119	1 009	4	3.914	2.829	9237.20	1955	1526
Gąbin	146.21	11073	1 088	6	4.891	4.403	11862.28	3191	2928
Łąck	93.99	5363	548	1	2.413	0.788	2919.67	1589	559
Mała Wieś	108.78	6166	584	4	3.634	2.874	8134.10	1759	1381
Nowy Duninów	146.23	3951	409	2	1.927	1.062	4586.71	1151	666
Radzanowo	104.45	8356	950	3	4.952	3.635	6973.67	2458	1910
Słubice	95.82	4521	467	3	2.545	1.688	6198.99	1378	915
Słupno	74.93	7343	902	3	4.005	2.704	4688.09	2520	1666
Stara Biała	111.12	11721	1 411	4	5.286	4.247	7756.99	3248	2813
Staroźreby	137.66	7435	784	4	3.976	2.622	7676.43	2024	1466
Wyszogród	95.65	5698	538	3	3.324	2.251	5322.62	1531	1129

The symbols in the table are explained in the research methodology section.

Table 2. Indicators of socio-spatial accessibility of educational services in the municipalities of Płock district

Municipality	X_1	X_2	X_3	X_4	X_5	X_6	X_7
Bielsk	0.48828	0.03995	1.15768	0.37123	0.21545	0.81385	0.87441
Bodzanów	0.36408	0.02200	0.63939	0.36213	0.21759	0.59697	0.63823
Brudzeń Duży	0.31881	0.01877	0.67219	0.35841	0.19929	0.61573	0.66406
Bulkowo	0.64935	0.03421	1.18730	0.30106	0.13235	0.69071	0.71739
Drobin	0.39643	0.02787	1.02197	0.30626	0.16520	0.72279	0.78056
Gąbin	0.55147	0.04104	1.22674	0.37118	0.24683	0.90022	0.91758
Łąck	0.18248	0.01064	0.41442	0.26989	0.19146	0.32656	0.35179
Mała Wieś	0.68493	0.03677	1.10072	0.35333	0.16978	0.79086	0.78511
Nowy Duninów	0.48900	0.01368	1.03788	0.23154	0.14520	0.55112	0.57863
Radzanowo	0.31579	0.02872	0.60582	0.52125	0.27389	0.73405	0.77705
Słubice	0.64240	0.03131	1.17878	0.27230	0.14760	0.66326	0.66401
Słupno	0.33259	0.04004	0.74906	0.57678	0.35537	0.67516	0.66111
Stara Biała	0.28349	0.03600	0.75672	0.54751	0.36264	0.80344	0.86607
Staroźreby	0.51020	0.02906	1.00604	0.34157	0.19097	0.65946	0.72431
Wyszogród	0.55762	0.03136	0.90253	0.42291	0.21211	0.67720	0.73743

Source: own study

Table 3. Standardization of indicators of socio-spatial accessibility of educational services in the municipalities of Płock district

Municipality	Z_1	Z_2	Z_3	Z_4	Z_5	Z_6	Z_7	W_{DSPUO}
Bielsk	0.24614	1.10956	0.97351	−0.02515	0.00576	0.98688	1.14724	0.63485
Bodzanów	−0.57671	−0.78321	−1.06765	−0.11350	0.03639	−0.62938	−0.56163	−0.52796
Brudzeń Duży	−0.87661	−1.12429	−0.93844	−0.14965	−0.22591	−0.48960	−0.37472	−0.59703
Bulkowo	1.31323	0.50438	1.09017	−0.70633	−1.18533	0.06919	0.01116	0.15664
Drobin	−0.36236	−0.16376	0.43908	−0.65586	−0.71450	0.30828	0.46822	−0.09727
Gąbin	0.66477	1.22467	1.24552	−0.02569	0.45556	1.63063	1.45959	0.95072
Łąck	−1.77979	−1.98181	−1.95362	−1.00890	−0.33813	−2.64464	−2.63406	−1.76299
Mała Wieś	1.54895	0.77473	0.74919	−0.19896	−0.64889	0.81561	0.50109	0.50596
Nowy Duninów	0.25089	−1.66138	0.50174	−1.38124	−1.00116	−0.97115	−0.99284	−0.75073
Radzanowo	−0.89662	−0.07438	−1.19986	1.43113	0.84334	0.39217	0.44284	0.13409
Słubice	1.26717	0.19849	1.05664	−0.98552	−0.96672	−0.13537	−0.37510	0.00851
Słupno	−0.78529	1.11924	−0.63571	1.97023	2.01125	−0.04672	−0.39605	0.46242
Stara Biała	−1.11063	0.69305	−0.60557	1.68605	2.11548	0.90935	1.08691	0.68209
Staroźreby	0.39138	−0.03902	0.37632	−0.31314	−0.34509	−0.16372	0.06121	−0.00458
Wyszogród	0.70552	0.20436	−0.03133	0.47654	−0.04209	−0.03152	0.15612	0.20537

Source: own study

COMPARATIVE ANALYSIS OF THE MUNICIPALITIES WITHIN THE PŁOCK DISTRICT

When comparing the accessibility of educational services in the municipalities of the Płock district, it is necessary to consider separately the conditions taken into account in the analysis. The individual normalized indicators produce an image of the accessibility of educational services (see: Fig. 2) in three dimensions, namely:

- the social dimension, illustrating what share of the primary school corresponds to 100 potential students, based on Z_1 indicator;
- the spatial dimension, where the greatest emphasis is placed on the density of primary schools and their location in relation to land and buildings of residential housing, taking into account the indicators Z_2, Z_3, Z_4, Z_5;

- the service efficiency dimension, or the effectiveness of service for a given area by education services, based on the Z_6 and Z_7 indicators.

According to the adopted research methodology, within each single normalized indicator, 4 groups of municipalities were distinguished in terms of the regularity and correctness of educational services coverage:

- group I, in which the normalized ratio was above 1;
- group II, in which the normalized ratio was above 0 but below 1;
- group III, in which the normalized ratio ranged from 0 to −1;
- group IV, in which the normalized ratio was below −1.

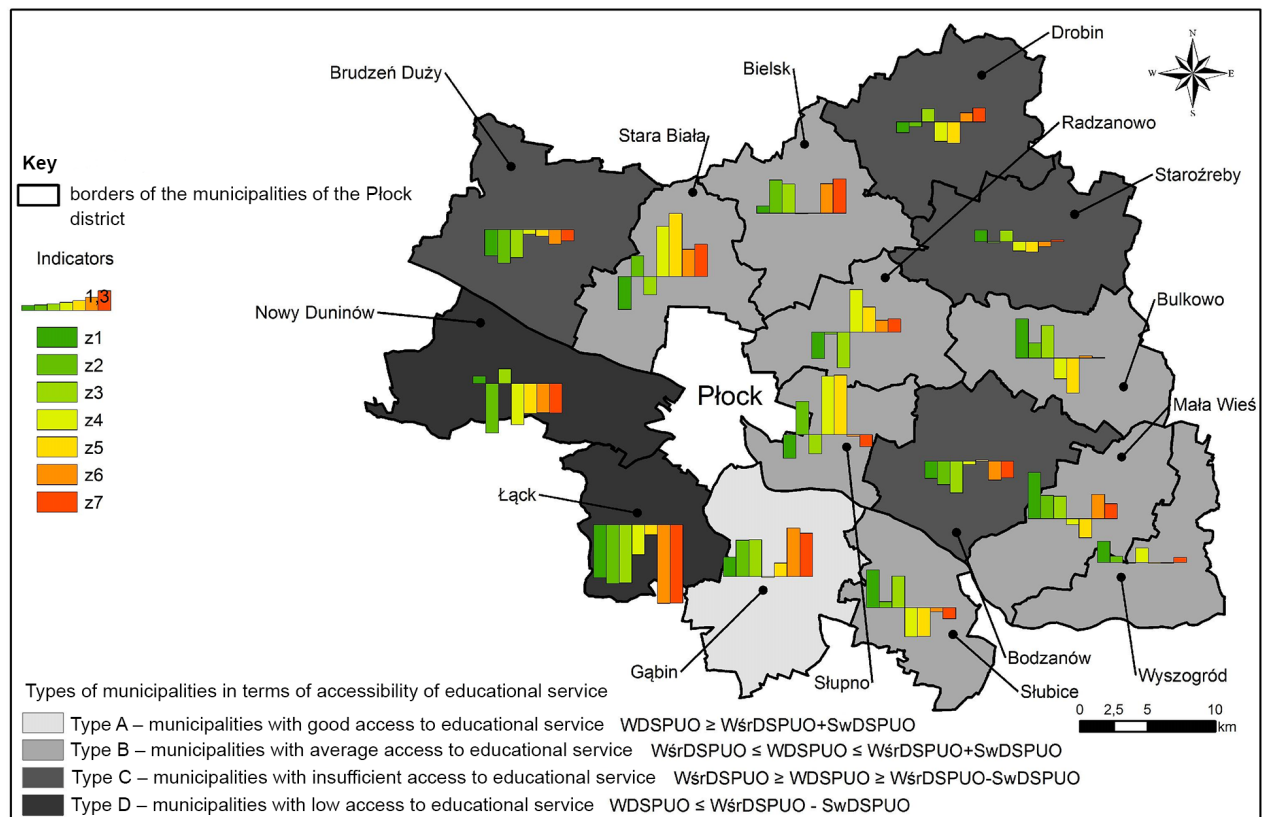According to the adopted principles, the corresponding types were assigned to individual munici-

Fig. 2. Diversification of the municipalities of Płock district by types and standardized indicators of the accessibility of educational services

Source: own study

palities depending on a single indicator, as shown in Table 4.

When analysing the situation regarding the resources related to the base of primary schools, one can use the assignment of a municipality to a set of units characterized by different levels of educational services. Numbers given in brackets (nI-nII-nIII-nIV) mean that the dominance of indications in nI and nII cells present a good situation and the advantage of digits in nIII and nIV positions point to poor accessibility of educational services. It is clear from then above that the worst situation is encountered in the following municipalities: Łąck (0-0-1-6) – indications in individual types) and in Brudzeń Duży (0-0-6-1), whereas the best situation is found in Gąbin (4-2-1-0) and in Bielsko (2-4-1-0). The Stara Biała municipality (3-2-1-1) appear relatively posi-

tive, despite the fact of being qualified to the weakest group in the social context, as well as the Bulkowo municipality (2-3-1-1), despite the negative indicator of scattered development in relation to educational institutions. The level of educational service coverage is unsatisfactory in Bodzanów (0-1-5-1) and in Nowy Duninów (0-2-2-3).

Socio-spatial accessibility of educational services should be assessed as average in the following municipalities: Mała Wieś (1-4-2-0), Słubice (2-1-4-0), Radzanowo (1-3-2-1), Wyszogród (0-4-3-0), Staroźreby (0-3-4-0), and Drobin (0-3-4-0). Słupno municipality (3-0-4-0) reveals a particular situation, having received very good results in the assessment in the context of relative accessibility, but quite unfavorable assessment in terms of social and service effectiveness.

Table 4. Groups of municipalities with regard to normalized indicators of socio-spatial accessibility of educational services

Indicator Symbol	Groups of municipalities (I–IV) and their quantity (N)							
	I	N	II	N	III	N	IV	N
Z_1	Mała Wieś, Bulkowo, Słubice	3	Bielsk, Nowy Duninów, Staroźreby, Gąbin, Wyszogród	5	Radzanowo, Brudzeń Duży, Słupno, Bodzanów, Drobin	5	Łąck, Stara Biała	2
Z_2	Gąbin, Słupno, Bielsk	3	Mała Wieś, Stara Biała, Bulkowo, Wyszogród, Słubice	5	Staroźreby, Radzanowo, Drobin, Bodzanów	4	Brudzeń Duży, Nowy Duninów, Łąck	2
Z_3	Gąbin, Bulkowo, Słubice	3	Bielsk, Mała Wieś, Nowy Duninów, Drobin, Staroźreby	5	Wyszogród, Stara Biała, Słupno, Brudzeń Duży	4	Bodzanów, Radzanowo, Łąck	3
Z_4	Słupno, Stara Biała, Radzanowo	3	Wyszogród	1	Bielsk, Gąbin, Bodzanów, Brudzeń Duży, Mała Wieś, Staroźreby, Drobin, Bulkowo, Słubice	9	Łąck, Nowy Duninów	2
Z_5	Stara Biała, Słupno	2	Radzanowo, Gąbin, Bodzanów, Bielsk	4	Wyszogród, Brudzeń Duży, Łąck, Staroźreby, Mała Wieś, Drobin, Słubice	7	Nowy Duninów, Bulkowo	2
Z_6	Gąbin	1	Bielsk, Satra Biała, Mała Wieś, Radzanowo, Drobin, Bulkowo	6	Wyszogród, Słupno, Słubice, Staroźreby, Brudzeń Duży, Bodzanów, Nowy Duninów	7	Łąck	1
Z_7	Gąbin, Bielsk, Stara Biała	3	Mała Wieś, Drobin, Radzanowo, Wyszogród, Staroźreby, Bulkowo	6	Brudzeń Duży, Słubice, Słupno, Bodzanów, Nowy Duninów	5	Łąck	1

Source: own study

CONCLUSIONS

Having analysed the synthetic Perkal indicator, presented in Table 3 and in Figure 3, it can be concluded that in terms of access to educational services, the municipalities of Płock district are quite diverse. Regarding their assessment on the basis of 7 characteristics, and, at the same time, in order to diversify them within the limits of the district, the division into typological groups was applied in accordance with the following principle:

- type A (with good access to educational services) – in which the value of the synthetic index exceeds the value of the average total and standard deviation: $W_{DSPUO} \geq W_{śrDSPUO} + Sw_{DSPUO}$, Gąbin municipality;

- type B (with an average access to educational services) – where $W_{śrDSPUO} \leq W_{DSPUO} \leq W_{śrDSPUO} + Sw_{DSPUO}$, Stara Biała, Bielsk, Mała Wieś, Słupno, Wyszogród, Bulkowo, Radzanowo, and Słubice municipalities;
- type C (with insufficient access to educational services) – where the synthetic index meets the condition of $W_{śrDSPUO} \geq W_{DSPUO} \geq W_{śrDSPUO} - Sw_{DSPUO}$, Staroźreby, Drobin, Bodzanów, and Brudzeń Duży municipalities;
- type D (with poor access to educational services) – , in which $W_{DSPUO} \leq W_{śrDSPUO} - Sw_{DSPUO}$, New Duninów and Łąck municipalities.

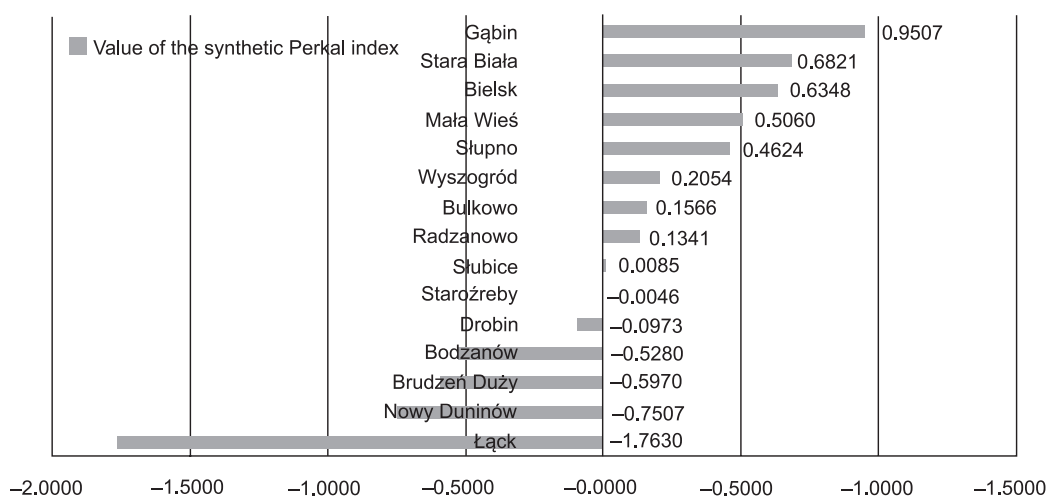Unfortunately, the analysis we have conducted did not confirm the formulated theses. The obtained ratios

Fig. 3. The synthetic index of socio-spatial accessibility in the municipalities of Płock district

Source: own study

are unsatisfactory both in terms of individual characteristics, and the synthetic index. Of course, you can find positive characteristics in individual municipalities, but they do not significantly affect the comprehensive assessment of the existing situation. There was also no direct link established between the level of access to educational services and the distance from Płock town, which is a clear explanation that education at the basic level is the task belonging to the municipality, and it does not depend on the location in relation to a large urban center.

From the scientific point of view, it should be emphasized that the results obtained paint a picture of the diverse situation in relation to the average conditions in the group of analysed municipalities. The weakness of the method applied is the lack of the possibility of directly referring the obtained synthetic index to the analogous assessment in the municipalities of another district. Therefore, it should be remembered that the results of index calculations can be directly compared with analogous data in any municipality, whereas the normalization of indicators should always be performed in a given group of the analysed administrative units of the local self-government.

The elaborated results may find their practical application for local self-government authorities. They might provide the basis for optimizing the location of the educational facilities network, not only based on the municipality's real estate resources, but also on the planned housing areas. Theoretically, a fairly large diversification of the analysed municipalities in terms of access to primary schools may indicate shortages of institutions in terms of socio-spatial accessibility. Of course, this is most evident in municipalities with a small number of primary schools and dispersed settlement. Characteristically, the worst situation occurred in those municipalities, which are also most attractive in terms of natural resources. Large areas of forests and water reservoirs create a natural barrier of spatial accessibility, which can be compensated only by introducing an additional educational centre. Although the assessment presents the current situation, it can be treated prospectively, because all the primary schools included therein will be shaping the educational system from September 1, 2019 onwards, that is after the junior high schools are completely extinguished.

Taking into account the fact that the analysis also took into account children aged 5-6, that is, those that will enter the first grade within the next two years, and the location of primary schools based on the resolutions by municipal councils to adapt the primary school network to the new system, it can be assumed that the presented results will be valid after 2019 or may slightly deteriorate depending on the pace of urbanization in particular municipalities.

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ANALIZA DOSTĘPNOŚCI SPOŁECZNO-PRZESTRZENNEJ USŁUG OŚWIATY W GMINACH POWIATU PŁOCKIEGO

ABSTRAKT

Problematyka podjęta w pracy dotyczy dostępności przestrzennej podstawowych publicznych usług oświaty – ważnego kryterium oceny poziom rozwoju społecznego regionu oraz jakości życia mieszkańców. Aktualność zagadnienia wynika ze zmian w Ustawie Prawo oświatowe z dnia 14 grudnia 2016 r. zakładających likwidację gimnazjów i powrót do 8-letnich szkół podstawowych. Jako obiekty badań wytypowano gminy skupione wokół rdzenia jakim jest Płock. Zgodnie z Krajową Strategią Rozwoju Regionalnego 2010–2020 gminy objęte analizą zaliczono do obszarów koncentracji negatywnych zjawisk społeczno-gospodarczych, o niskim poziomie dostępności mieszkańców, szczególnie obszarów wiejskich, do usług publicznych, w tym usług oświaty. Metodą badań była analiza wielowskaźnikowa oparta o informacje przestrzenne za-

warte w BDL-u oraz BDOT. Z wykorzystaniem oprogramowania ArcMap wygenerowano tereny zabudowy mieszkaniowej i budynki mieszkaniowe leżące w okręgach obsługi usług oświaty, co pozwoliło na określenie parametrów dostępności. Wykonana analiza pozwoliła na przedstawienie zróżnicowania dostępności usług oświaty w gminach powiatu płockiego oraz wyznaczenie obszarów problemowych. Ujęcie przestrzenne zagadnień dostępności społecznej może mieć aspekt praktyczny przy podejmowaniu przez władze samorządowe decyzji o przekształcaniu gimnazjów w szkoły podstawowe lub typowaniu lokalizacji nowych obiektów oświatowych.

Słowa kluczowe: dostępność przestrzenna, szkoła podstawowa, gmina, planowanie przestrzenne