

Original scientific paper

UDC 911.37:711.4(497.11 Zlatibor district)
<https://doi.org/10.2298/GSGD2202083M>

Received: July 12, 2022

Corrected: August 11, 2022

Accepted: September 05, 2022

Zoran Milošević^{1*}, Sanja Raščanin*

** Primary School "Janko Veselinović", Belgrade, Serbia*

PERSPECTIVE OF SUSTAINABLE DEVELOPMENT IN THE FUNCTIONAL AREA OF NODAL CENTRES OF ZLATIBOR DISTRICT

Abstract: The concept of sustainable development in the functional area of the network of the most important settlements is based on the dependence on the settlement environment as well as the development of the entire settlement system in the Zlatibor district. The assessment of the functional development of nodal centres and their impact on the sustainable socioeconomic transformation of other settlements through integrative-incentive mechanisms is based on: the dominant role of nodal settlements as a geospatial factor in the sustainable development of the settlement system of the Zlatibor district; structural and demographic changes within the socioeconomic area; complementarities with settlement specificities; development needs of functional centres; integration into the spatial system of nodal settlements of Serbia; manifestations of differentiated planning and research into the sustainable development of complex geospatial entities. Based on the functional-process approach, the concept of sustainable development of the settlement system was formulated based on the following foundations: elements of the settlement system formed on the basis of spatial-geographical conditions; the main areas of population concentration are urban environments; the high conditionality of the socioeconomic development of the settlement system based on the gravitational-encouraging and polarizing effects of the influence of nodal settlements; from the process of redistribution within the active population, settlement-functional concentration and the development of other settlements result.

Key words: sustainable development, nodal centres, urban cores, daily urban system

¹ znmilosevic@gmail.com (corresponding author)

Introduction

Spatial and functional relations and connections between the settlements of the Zlatibor district are the focus of development concepts of sustainable development. Centres of development (nodal places), in the system of settlements, are the core of functional changes that, with their integrative-incentive mechanisms, affect the complex system of correlation with other settlements of the socioeconomic area, which creates the basis for determining the main factors of the structural transformation of the natural and social environment (Milošević, 2016).

The research of nodal centres is a complex activity that is based on the knowledge of possibilities or alternatives that can solve the problems of sustainable development in the dynamic regional integration processes of the settlement system of the Zlatibor district.

The concept of sustainable development, as a link between social (socioeconomic) (Figure 1) and ecological (natural) (Figure 2) paradigms of society's development, represents the perspective of an analytical approach to geospatial resources. Basis of mutual connection of individual elements of such an open system is the balance of different variables based on the following postulates: 1. Social justice, 2. Economic growth, 3. Political acceptability, 4. Preservation of the environment and 5. Ecological immutability.



Fig. 1. Anthropocentric system of sustainable development (Milošević, 2016)

Sustainable development, in the urban zone, is based on the efficiency of ensuring human prosperity and the impact on ecological resources in a given space (Yan, 2018). The most described model of sustainable development is represented by the definition of the United Nations Commission (World Commission on Environment and Development), according to which the needs of current development will not endanger future development and needs. According to these guidelines, the strategic method of defining and monitoring the limits of sustainable development was promoted under the assumption that natural resources are limited and that there is a limit to the Earth's ecosystem (Farrell & Hart, 1998). The ecological limit of a natural resource (ELNR) could be described as being equal to the rate of regeneration of the resource (RR) - ($ELNR = RR$) i.e. natural capital cannot be replaced by artificial capital (Fitzpatrick, 2020).

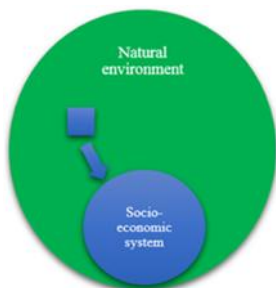


Fig. 2. Ecocentric system of sustainable development (Milošević, 2016)

Population-geographical Determinants of Sustainable Development

The settlement core¹, with its attractive and repulsive (PUSH - PULL) factors, forms its hierarchical position and functional importance in the settlement network. In this way, urban centres, with their many specificities, in the functional and morphological sense, define the degree of attractiveness for migratory movements of the population (Venny, 2019). According to the EU - OECD definition, functional urban areas (FUAs) are separated based on two aspects: the territory, which is populated by the population, and the functional-economic one, which also includes territories outside the boundaries of urban centres (Dijkstra, 2019). More urban - nodal centres form polycentric territorial development, which strengthens the connections between cities and villages (Živanović et al., 2021).

The analysis of the spatial dynamics of changes in the demographic size of settlements determines the establishment of spatial organization and the development of functional relationships and connections in the settlement system of the Zlatibor district. A network of 439 settlements has developed on the territory of the Zlatibor district, of which eleven settlements are in the administrative category of a city and one in the category of a small town. All other settlements are rural. For the purposes of the work, the categories of settlements according to the number of inhabitants, from the 1948 census, were separated into four basic categories and 7 subcategories:

1. Large settlements (more than 30,001 inhabitants)
2. Medium-sized settlements (from 10,001 to 30,000 inhabitants)
3. Small settlements (with three subcategories: settlements from 1,001 to 3,000 inhabitants, settlements from 3,001 to 5,000 inhabitants and settlements from 5,001 to 10,000 inhabitants)
4. Very small settlements (with four subcategories: settlements with less than 100 inhabitants, settlements from 101 to 200 inhabitants, settlements from 201 to 500 inhabitants and settlements from 501 to 1,000 inhabitants)

An important indicator of spatial-functional connections and relations is the impact of nodal settlements on all settlement categories, especially on the most demographically vulnerable (smallest and most remote). The most value of demographic indicators is related to nodal centres, and the mutual relationship indicates the importance in hierarchical processes in the territory of the district. The municipal centre of Užice, which remained dominant until the 2011 census, stands out as a reference demographic indicator for the development of nodal centres (Table 1).

¹ Until the 1980s, settlement (functional) cores had the functions of poles of growth, and later, some of them, poles of development. According to F. Perroux (1955), it is a set of leading and expanding industries, located in urban areas, which promote the further development of economic activities through their influential area. With their effect, they began to influence the sociogeographical transformation and functional integration of the surroundings and the creation of smaller or larger functional-urban regions and daily urban systems - nodal regions (Tošić, 2009).

Tab. 1. Order of dominant nodal settlements in Zlatibor District according to relative demographic size in relation to Užice, according to selected census years (Milošević, 2016)

Rank	1	2	3	4	5	6	7	8	9	10	11	12
Settlement	Užice	Sjenica	Prijepolje	Priboj	Požega	Sevojno	Nova Va-roš	Bajina Bašta	Arilje	Čajetina	Kosjerić	Zlatibor
1948	10,219	3,77	2,828	2,3	2,249	1,847	1,768	1,222	785	654	558	115
	1.00	0.37	0.28	0.23	0.22	0.18	0.17	0.11	0.07	0.06	0.05	0.01
Settlement	Užice	Priboj	Prijepolje	Sjenica	Požega	Nova Va-roš	Bajina Bašta	Arilje	Sevojno	Kosjerić	Čajetina	Zlatibor
1981	47,046	14,917	14,543	11,099	10,41	8,5	6,284	4,982	4,655	2,988	1,778	1,237
	1.00	0.32	0.31	0.24	0.22	0.18	0.13	0.11	0.10	0.06	0.04	0.03
Settlement	Užice	Priboj	Prijepolje	Požega	Sjenica	Nova Va-roš	Bajina Bašta	Sevojno	Arilje	Kosjerić	Čajetina	Zlatibor
2002	55,083	16,209	15,031	13,206	13,13	10,257	9,543	7,445	6,744	4,116	3,162	2,344
	1.00	0.29	0.27	0.24	0.24	0.19	0.17	0.14	0.12	0.08	0.06	0.04
Settlement	Užice	Priboj	Sjenica	Požega	Prijepolje	Nova Va-roš	Bajina Bašta	Arilje	Sevojno	Kosjerić	Čajetina	Zlatibor
2011	52,646	14,92	14,06	13,153	13,33	8,795	9,148	6,763	7,101	3,992	3,336	2,821
	1.00	0.28	0.28	0.25	0.25	0.18	0.17	0.13	0.13	0.08	0.06	0.05

In the settlement system of the Zlatibor district, the first post-war census in 1948 is the basis for comparison. In the Zlatibor district there were 270,830 inhabitants with the largest population (38.16%) in very small settlements of 501 - 1,000 inhabitants (146 settlements) and the numerically the largest group of settlements in the category of 201 - 500 inhabitants (156 settlements) with 20.07% of the total population (Table 2). Large settlements were not formed in this period, while the demographically dominant role was played by the medium-sized settlement, Užice, with 10,219 inhabitants (3.77%) and the small settlement of Sjenica, with 3,770 inhabitants (1.39%). Apart from Sjenica, the sized group of small settlements consisted of another 66 settlements with a total of 33.19% of the total population of the district. This group of settlements included the nodal centres of Bajina Bašta, Nova Varoš, Požega, Priboj and Prijepolje. The largest population group of settlements were very small settlements with a total share of 61.64% (166,941 inhabitants). This group also included the remaining four nodal centres of Arilje, Kosjerić, Čajetina and Zlatibor with 2,112 inhabitants (0.78%).

Tab. 2. Size structure of settlements, 1948-2011 (Milošević, 2016)

Settlements category	The size of the settlement according to the number of inhabitants	Number of inhabitants in 1948.	Number of settlements	%	Cumulative population series	Cumulative array of population number %	Number of inhabitants in 1948.	Number of settlements	%	Cumulative population series	Cumulative array of population number %	Number of inhabitants in 2002.	Number of settlements	%	Cumulative population series	Cumulative array of population number %	Number of inhabitants in 2011.	Number of settlements	%	Cumulative population series	Cumulative array of population number %		
Large	more than 30,001	0	0	0.00	0	0.00	0	0	0.00	0	0.00	0	0	0.00	0	0.00	0	0	0.00	0	0.00		
Totally large	10,001 – 30,000	10,219	1	3.77	10,219	3.77	54,384	4	16.20	104,430	30.46	71,219	5	22.72	126,302	40.30	55,463	4	19.36	108,109	37.73		
Medium	5,001 – 10,000	10,219	1	3.77	10,219	3.77	54,384	4	16.20	104,430	30.46	71,219	5	22.72	126,302	40.30	55,463	4	19.36	108,109	37.73		
Totally medium	1,001 – 5,000	0	0	0.00	0	0.00	0	0	0.00	0	0.00	0	0	0.00	0	0.00	0	0	0.00	0	0.00		
Small	5,001 – 5,000	3,770	1	1.39	13,989	5.16	14,784	2	4.41	116,214	34.67	23,732	3	7.57	150,034	47.87	31,807	4	11.10	139,916	48.83		
Totally small	1,001 – 3,000	89,900	66	33.19	103,889	38.35	41,802	32	12.46	167,653	50.00	72,278	2	2.39	157,312	50.19	10,341	3	3.61	150,257	52.44		
Very small	501 – 1,000	103,354	146	38.16	207,243	76.51	95,399	134	38.40	262,962	78.40	49,421	73	15.89	241,498	77.58	28,714	18	10.02	178,971	62.46		
Totally very small	201 – 500	54,300	156	20.07	261,603	96.58	62,289	179	18.55	325,251	96.95	53,707	159	17.14	295,205	94.20	46,607	31	16.26	268,430	96.68		
Very small	101 – 200	8,050	52	2.07	290,653	99.55	8,230	54	2.44	332,481	99.39	33,789	92	4.40	308,994	98.60	12,506	89	4.39	281,096	98.10		
Small	less than 100	1,774	31	0.45	270,580	100	4,059	30	1.48	336,570	100	1,682	4	0.48	313,390	100	5,533	41	2.54	286,549	100		
Totally small	less than 100	16,841	277	6.03	335,570	100	335,570	439	100.00	335,570	100.00	335,570	439	100.00	335,570	100.00	335,570	439	100.00	335,570	100.00	335,570	100.00
In total		270,836	439	100.00			335,570	439	100.00			335,570	439	100.00			286,549	439	100.00			286,549	439

In 2011, the number of residents of nodal centres was 52.36%, and thus the process of urbanization reached the highest level since the 1948 census (Figure 3). Contrary to this process, the number of settlements with a very small number of inhabitants (409 settlements) is increasing, which indicates the intense death and displacement of this category of settlement. The category of the most many settlements remained the same (from 200-501 inhabitants with 16.26%).

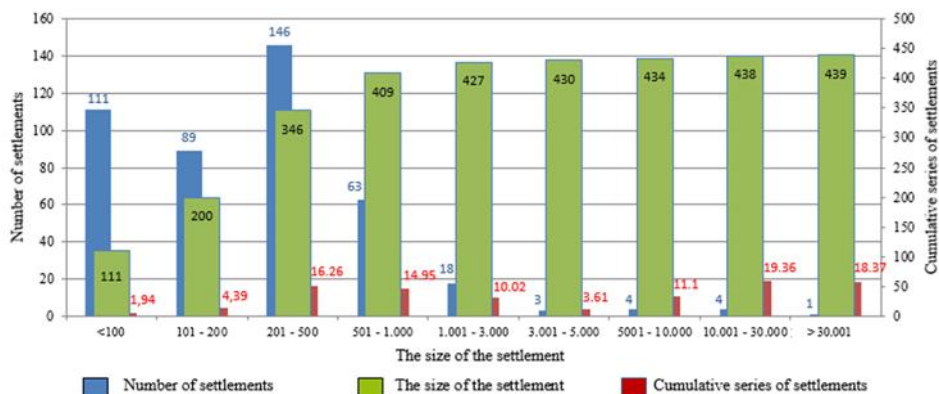


Fig. 3. Histogram of distribution of settlements according to demographic size in 2011 (Milošević, 2016)

The settlement with the fewest inhabitants was in the municipality of Sjenica (Skradnik, 1 inhabitant), and the only increase (930 inhabitants) compared to the 2002 census was in the nodal centre of Sjenica (14,060 inhabitants). After the 2002 census, the demographic picture of rural settlements changed drastically, which was confirmed by research of these regions and the selection of the area of southwestern Serbia, i.e. its mountainous regions as the most threatened settlements (Milivojević et al., 2008). At the beginning of the analysed census period, in the group of settlements with over 1,000 inhabitants (68 settlements), 38.35% of the population lived in (with Užice in the category of medium-sized settlements). According to the last census, the population concentration of this group was 30 settlements (6.83%), where 62.46% of the total population lived.

The entire observed period from 1948-2011. is characterized by uneven demographic development of settlements with demographic expansion in a decreasing number of settlements in the gravitational-urban sphere of nodal centres and an increase in the number of settlements of the smallest categories. In the nodal centre of Užice, the largest increase in the number of inhabitants was recorded (542.74%). Polarization between nodal centres was constantly taking place until 2011. The largest settlement-population changes occurred in the category of small settlements of 1,001-3,000 inhabitants (-48 settlements) with a decrease of 61,186 inhabitants and in the category of very small settlements of 501-1,000 inhabitants (-83 settlements) with a decrease of 60,502 inhabitants (Table 3).

Tab. 3. Change in the size structure of settlements, 1948-2011 (Milošević, 2016)

Settlements category	The size of the settlement according to the number of inhabitants	Number of inhabitants in 1948.	Number of settlements	Number of inhabitants in 1981.	Number of settlements	Number of inhabitants in 2002.	Number of settlements	Number of inhabitants in 2011.	Number of settlements	1981/1948.		2002/1981.		2011/2002.		2002/1948.		2011/1948.	
										Change in the number of settlements	Population change index	Change in the number of settlements	Population change index	Change in the number of settlements	Population change index	Change in the number of settlements	Population change index	Change in the number of settlements	Population change index
Large	more than 30.000	0	0	47.046	1	55.083	1	52.646	1	-	1	117.08	0	95.57	0	1	-	1	-
Totally large		0	0	47.046	1	55.083	1	52.646	1	-	1	117.08	0	95.57	0	1	-	1	-
Medium	10.000 – 30.000	10.219	1	54.384	4	71.219	5	55.463	4	532.18	3	130.96	1	77.88	-1	4	701.60	4	542.74
Totally medium		10.219	1	54.384	4	71.219	5	55.463	4	532.18	3	130.96	1	77.88	-1	4	701.60	4	542.74
Small	5.001 – 10.000	0	0	14.784	2	23.752	3	31.807	4	-	2	160.52	1	134.03	1	-	3	-	4
	3.001 – 5.000	3.770	1	9.637	2	7.278	2	10.341	3	255.62	1	75.52	0	142.09	1	191.27	1	274.30	2
Totally small	1.001 – 3.000	89.990	66	41.802	32	34.765	24	28.714	18	46.45	-34	83.17	-8	82.59	-6	38.63	-42	31.91	-48
	501 – 1.000	103.354	146	95.309	134	49.421	73	42.852	63	92.52	-12	51.86	-61	86.70	-10	48.17	-73	41.46	-83
Very small	201 – 500	54.360	156	62.289	179	53.707	159	46.607	146	114.59	23	86.22	-20	86.78	-13	98.90	3	85.74	-10
	101 – 200	8.050	52	8.230	54	13.789	92	12.566	88	102.24	2	167.55	38	91.13	-4	171.29	40	156.10	36
Totally very small	less than 100	1.177	17	2.089	31	4.402	80	5.553	112	177.49	14	210.72	49	126.15	32	374.00	63	471.79	95
		166.941	371	167.917	398	121.685	404	107.578	409	100.81	27	72.46	6	88.41	5	72.92	33	64.46	38
In total		270.830	439	335.570	439	313.396	439	286.549	439	123.90	0	93.39	0	91.43	0	115.72	0	105.80	0

Spatial-geographic Determinants of Sustainable Development

Settlements and their internal and external organization, i.e. the development of the settlement network in a certain territory, mutual arrangement, dispersion and mutual relations, as indicators of sustainable development factors, can be analysed on the basis of spatial-geographical models.

In the analysis of the development of spatial-demographic relations in the Zlatibor district, two models can be used: a model based on the distance of settlements from nodal centres - municipal centres (isotelic model) and a model based on the physical-geographic features (hypsometric model) of the Zlatibor district.

Isotelic Model

The distance of settlements from nodal centres indicates spatial and functional connections as well as the causality of the centre-periphery relationship. Due to the complexity of gravity connections and the complexity of space, a network of settlements has been developed, which is dimensioned by the set limiting factors of municipal boundaries and belonging to the functional area of the nodal centre.

The first strip of 5 kilometres represents the suburban zone and gravitationally belongs to the urban periphery of the nodal centres. The number of inhabitants of this zone is growing in proportion to the decrease in the number of inhabitants of rural settlements and the limitation of the city core. These zones include 8 settlements in the municipality of Arilje, 6 settlements in the municipality of Bajina Bašta, 6 settlements in the municipality of Kosjerić, 5 settlements in the municipality of Nova Varoš, 6 settlements in the municipality of Požega, 5 settlements in the municipality of Priboj, 13 settlements in the municipality of Prijepolje, 9 settlements in the municipality of Sjenica, 6 settlements in the municipality of Užice (together with Sevojna) and 4 settlements of the municipality of Čajetina (together with Zlatibor). In 2011, 56,995 inhabitants lived within this concentric zone (together with the nodal centres of 197,138 inhabitants), which represented 68.80% of the total population of the district. This data clearly shows that the core of the demographic transformation of the area is concentrated in 68 settlements (15.49%) (Table 4). The growth in the number of inhabitants of this group of settlements had positive values until the last census (exception in 1961/1971).

Tab. 4. Change in the number of inhabitants by isotel zones from 1948 to 2011 (Milošević, 2016)

Isotelic belt	Number of settlements	Population							
		1948.	1953.	1961.	1971.	1981.	1991.	2002.	2011.
up to 5 km	68	40,624	44,220	47,579	43,314	46,501	52,432	55,160	56,995
5-10km	134	83,607	86,962	85,332	74,448	65,010	55,677	47,714	41,366
10-15km	109	65,464	69,342	68,313	60,306	51,299	40,508	32,260	25,559
15-20km	73	39,330	42,136	42,061	37,905	32,961	27,272	21,531	16,830
20-25km	39	12,731	14,465	14,972	13,851	11,711	8,303	5,738	4,456
25-30km	3	2,237	2,443	2,094	1,826	1,647	1,406	1,034	885
30-35km	3	1,268	1,298	1,216	1,008	792	497	458	315
In total	429	245,261	260,866	261,567	232,658	209,921	186,095	163,895	146,406
Municipal centres	10	25,569	32,149	47,351	91,407	125,649	149,731	149,501	140,143
District	439	270,830	293,015	308,918	324,065	335,570	335,826	313,396	286,549

By moving away from the nodal centres (municipal centres), the number of inhabitants has decreased since the 1961 census, most in concentric zones between distances of 5-10 km and 10-15 km. The structure of those changes points to the conclusion that the population of these two belts mostly participated in migratory movements towards urban and suburban settlements.

Demographically, the most vulnerable population is located in the zones outside the 20 km zone, because spatially and infrastructurally, they have limited conditions for integrative flows with the centre of the municipality. There was a total of 10 of these areas (45 settlements) in the municipalities of Bajina Bašta, Požega, Priboj, Prijepolje, Sjenica and Užice. In 2011, 5,656 inhabitants, or 1.97% of the population, lived in this group of settlements. The largest number of settlements of this group were located in the municipality of Sjenica (21) and they made up 20% of the settlements of the municipality. Of this number, 14 settlements were at the demographic limit because they belonged to settlements with less than 100 inhabitants.

The largest zone of isotel coverage is the municipality of Užice, where there are 3 settlements at a distance of more than 30 km (Figure 4). The settlements of Kotroman, Kršanje and Panjak belonged demographically to the size group of very small settlements (315 inhabitants) with a specific geographical position on the state border with the Republic of Bosnia and Herzegovina. In total, this group of settlements had the absolute lowest level of changes in the period from 1948 to 2011.

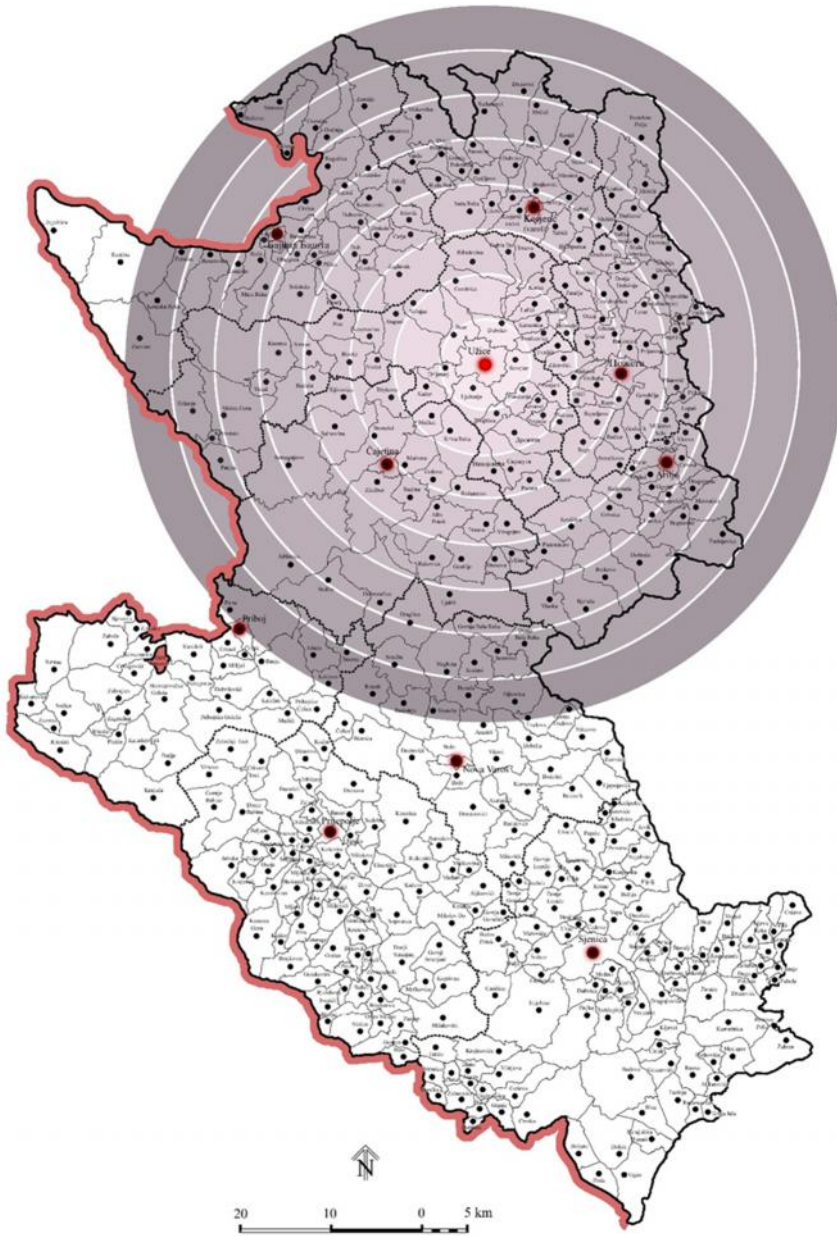


Fig. 4. Distribution of settlements according to isotel zones (municipal centre of Užice) (Milošević, 2016)

By analysing these indicators of spatial organization and transformation of the demographic contingent, the strengthening of the centrality and external functions of municipal centres with suburban zones is clearly observed, and the inertness of settlements in remote zones with intensive demographic emptying and transformations in settlements on the verge of extinction is increasing (60 settlements had less than 50 inhabitants in 2011).

Hypsometric Model

The orographic factors of the area of the Zlatibor district influenced the physiognomic-morphological development of the settlements, conditioning the formation of the old Vlach type of settlements of the broken type in most of the settlements. Rural settlements are scattered, broken and irregularly shaped with an average altitude of 815 m, while the altitude of the nodal centres is lower and ranges around 570 m. This conditionally sets the limits of possibilities for the development of the social sector and the development of settlements in a spatial sense. Considering the average altitude, rural settlements are located in a zone conditionally favourable for the development and settlement of settlements in the function of agricultural production as the dominant branch of the economy, while the favourable conditions of altitudes for the settlement of nodal centres can be conditionally observed because they are located in areas of different orographic and morphological entities as limiting factors (Đorđević, 2004).

From a hypsometric point of view, the municipalities of Arilje, Bajina Bašta and Požega have the most favourable conditions for the development and distribution of settlements. The administrative-demographic centres of settlements in these municipalities are located at altitudes below 500m, and from a hypsometric point of view, they are located in areas suitable for the distribution of the population. In the municipality of Arilje, 9 settlements are located in this zone, where 65.83% of the population lived in 2011, with a territory that occupies 18.63% of the total area of the municipality. In the municipality of Bajina Bašta, 21 settlements cover an area of 45.76% of the territory and 84.56% of the population lived in them (2011). The territory of the municipality of Požega includes 42 settlements, of which 30 administrative-demographic centres are located in the zone below 500 m and make up 87.76% of the total demographic size. Among the other municipalities, the settlements of the municipality of Užice, with an average altitude of about 600 m and 15 settlements below 500 m, where 82.79% of the population lived, and Kosjerić with 48.86% of the population (in 2011) in settlements below 500 m, stand out. In the other municipalities, the conditions for the distribution of settlements in hypsometric terms fall into conditionally favourable and unfavourable conditions. The settlements of Sjenica and Čajetina municipalities have the most unfavourable conditions. The average altitude of settlements in the municipality of Sjenica is about 1,000m (1,005 municipal centre), and in the municipality of Čajetina 900m (municipal centre 838m and city centre Zlatibor 956m).

The altitude of the nodal centres is more favourable compared to other settlements in the district, but the locations of some settlements along narrow river valleys can be characterized as conditionally favorable. The nodal centres of Arilje, Bajina Bašta (Figure 5), Kosjerić, Požega and Sevojno have the most favourable conditions for settlement development, and unfavourable considering the altitude of Nova Varoš, Sjenica, Čajetina and Zlatibor.

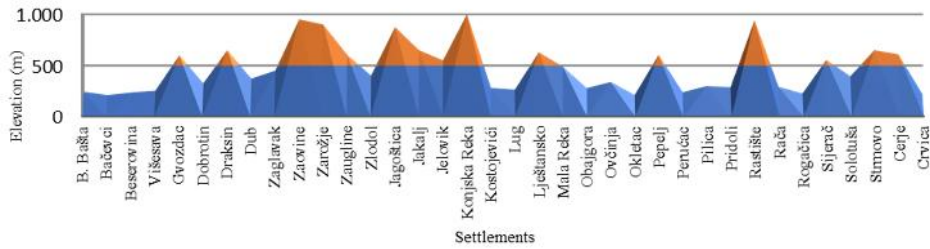


Fig. 5. Altitude distribution of settlements in the municipality of Bajina Bašta (Milošević, 2016)

The favourable location for the spatial development of nodal centres is also determined by the morphology of the terrain. The nodal centres of Priboj, Prijepolje and Užice, even at altitudes favourable for population expansion, have conditionally favourable parameters, given that they are morphological limited by the narrow valleys of the Lim and Đetinja rivers. The city and nodal centre of Zlatibor, given the character of the dominant economic branch (tourism), has favourable conditions for the development of the settlement even if it is located in a zone unfavourable to settlement (956m).

Functional-geographic Determinants of Sustainable Development

Based on the parameters of the ratio of individual activities and their sectors in the contingent of the active population that performs the occupation, the functional differentiation of the settlement can be determined.

Changes in the functional structure of municipal centres and urban settlements are represented by a ternary diagram with arrows from the values for the year 1991 to the values for the year 2011 (Figure 6).

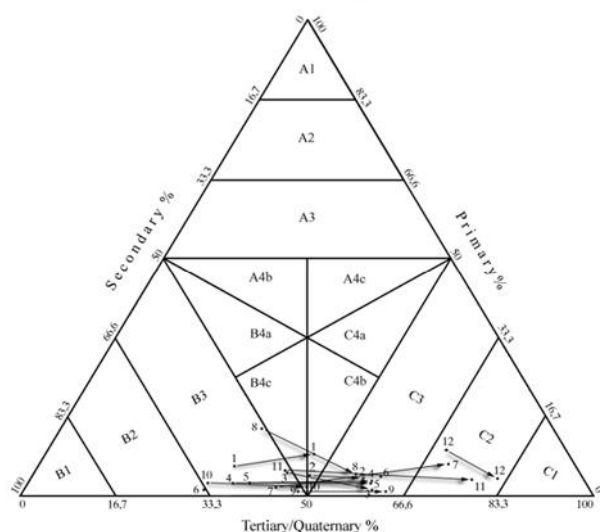


Fig. 6. Ternary diagram of the functional type of settlements (municipal centres and urban settlements), 1991-2011 (Milošević, 2016)

The diagram indicates a high degree of specialized activities in these nodal centres with a participation of over 50% in service and non-production activities (75% of settlements) and on the diagram they are grouped along the lower leg of the triangle representing the tertiary-quaternary sector.

The values for municipal centres and urban settlements (Table 5), correspond to the functional phase of settlements, with large differences in the census years. In the period up to 1991, urban settlements had a dominant industrial character (B2 and B3) except for the nodal centres of Bajina Bašta (C4b) and Zlatibor (C2). Bajina Bašta, as a service-industrial settlement, based its structure on secondary activities with numerous industrial plants from wood processing to electrical industry in correlation with the hospitality and tourism activities of the municipality. Zlatibor is a service centre of regional importance due to the size of its tourist facilities and its activity structure did not change during this census period (service type of settlement).

Tab. 5. Functional type of settlements (municipal centres and urban settlements) of Zlatibor district, 1991-2011 (Milošević, 2016)

Nodal center	Year	Nodal center											
		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
		Arijlje	Bajina Bašta	Kosjerić	Nova Varoš	Požega	Prijeb	Prijepolje	Sjenica	Užice	Sevojno	Čajetina	Zlatibor
Type of settlement	1991	B3	C _{4b}	B3	B3	B3	B2	B3	B3	B3	B3	B3	C2
	2011	C _{4b}	B3	C3	C3	C3	C3	C2	C3	C3	B _{3c}	C2	C2

- B2 - predominantly industrial (from 66.3% to 83.3% of employees in secondary activities);
- B3 - predominantly industrial (from 50% to 66.3% of employees in secondary activities);
- C2 - Extremely service-oriented type of settlement (from 66.3% to 83.3% of employees in tertiary-quaternary activities);
- C3 - predominantly service (from 50% to 66.3% of employees in secondary activities);
- B4c - industrial-service (from 33.3% to 50% of employees in industrial activities with the majority in t-k part.);
- C4b - service-industrial (from 33.3% to 50% of employees in tertiary-quaternary activities with the majority in the industrial sector).

After 1991, the structure of activity changed from the phase of industrialization to the phase of tertiarization, with the industrial base decreasing at the district level by 49%. The largest decrease in the secondary branch of activity was recorded in the nodal centre Priboj (76.28%) as a result of economic restructuring (companies "FAP", "Polyester" and others). An increase in the number of workers in industry was recorded only in Arilje (1.85%) with plants for the textile processing and the metal industry. The service sector in municipal and city centres has been growing in value since 1991 with a marked specialization of activities, so that all settlements, except for Bajina Bašta and Sevojno, are in the group of settlements with an index (S2 and S3).

The Function of the Work Centre as an Initiator of Sustainable Development

The degree of development of socioeconomic elements is manifested by nodal centers through a complex structure of interdependent relationships with the environment. The city is connected with its immediate and wider surroundings by heterogeneous spatial-functional connections. The intensity of connection with the environment is determined by the nodality of the city and the settlement-functional characteristics of the environment (Stamenković & Bačević, 1992).

The research and determination of these interactions is based on the synthesis of the spatial mobility of the workforce with the functional-demographic capacities of nodal centres in the form of daily urban systems (DUS) (Doksijadis, 1982), i.e. functional urban areas (FUA)^{2,3}.

The basic prerequisites for the development of nodal centres through daily migration processes are the premises:

- J Intensity and direction of daily migration, on the one hand, and the spatial distribution of settlements of origin and destination of daily migrants, on the other, provide an opportunity to determine borders, i.e. spatial coverage of daily urban systems;
- J To determine the fields of functional influence of the city centre by gathering and integrating the territories of settlements with similar migratory characteristics and
- J Internal differentiation of the daily urban system is based on the intensity of daily migration.

The direction, intensity and territorial reach of daily migration are defined by spatial (belonging to a functional urban area) and quantitative values (diversification of jobs). In the modern conditions of settlement development, the space of worker interaction between the place of work and the place of house is defined as the space of the field of influence as a result of modern processes of decentralization of urbanization (Tošić & Nevenić, 2007).

² The term functional area and functional urban area (FUA) was introduced by the Spatial Plan of the Republic of Serbia (1996 and 2010) with the aim of defining spatial-functional organization. In this way, 34 functional areas were constituted (with a regional or higher order center of the given area) whose functions cover the territories of three or more municipalities. From 2010, 60% of the territory (daily migrations combined with demographic size and degree of urbanization were taken into account).

The highest degree of functional interdependence of work centres and residential centres, expressed by the daily migration of workers, is achieved between settlements belonging to the same municipalities (Table 6, Table 7). In the observed period (2002-2011), these migrations accounted for 80.42% of the daily migrations of the active population performing a profession.

Tab. 6. Daily migrations of the active population performing an occupation, 2002-2011 (Milošević, 2016)

Municipality	Years	Total workers	Total migrants	Participation of migrants in the total employed population %	Daily migrants							
					In the home municipality		In another municipality		In another country		Unknown	
					Number	%	Number	%	Number	%	Number	%
Zlatibor district	2002.	113,091	25,193	22.28	20,259	80.42	4,056	16.10	167	0.66	711	2.82
	2011.	97,276	27,359	28.13	21,166	77.36	6,087	22.25	106	0.39	-	-
Municipal centers and urban settlements	2002.	55,435	7,290	13.15	5,147	70.60	1,971	27.04	72	0.99	100	1.37
	2011.	48,114	9,044	18.80	5,506	60.88	3,473	38.40	65	0.72	-	-
Other settlements	2002.	57,656	17,903	31.05	15,112	84.41	2,085	11.65	95	0.53	611	3.41
	2011.	49,162	18,315	37.25	15,660	85.50	2,614	14.27	41	0.22	-	-
Arijlje	2002.	8,357	2,013	24.09	1,803	89.57	193	9.59	2	0.10	15	0.75
	2011.	8,318	2,355	28.31	2,084	88.49	266	11.30	5	0.21	-	-
Municipal center	2002.	2,419	240	9.92	146	60.83	93	38.75	1	0.42	0	0.00
	2011.	2,536	527	20.78	378	71.73	149	28.27	0	0.00	-	-
Other settlements	2002.	5,938	1,773	29.86	1,657	93.46	100	5.64	1	0.06	15	0.85
	2011.	5,782	1,828	31.62	1,706	93.33	117	6.40	5	0.27	-	-
Bajina Bašta	2002.	12,265	2,907	23.70	2,546	87.58	279	9.60	63	2.17	19	0.65
	2011.	10,148	2,888	28.46	2,403	83.21	472	16.34	13	0.45	-	-
Municipal center	2002.	3,638	294	8.08	203	69.05	45	15.31	41	13.95	5	1.70
	2011.	3,031	451	14.88	307	68.07	136	30.16	8	1.77	-	-
Other settlements	2002.	8,627	2,613	30.29	2,343	89.67	234	8.96	22	0.84	14	0.54
	2011.	7,117	2,437	34.24	2,096	86.01	336	13.79	5	0.21	-	-
Kosjerić	2002.	5,169	795	15.38	628	78.99	124	15.60	0	0.00	43	5.41
	2011.	3,693	1,122	30.38	956	85.20	164	14.62	2	0.18	-	-
Municipal center	2002.	1,572	56	3.56	14	25.00	41	73.21	0	0.00	1	1.79
	2011.	1,324	165	12.46	108	65.45	56	33.94	1	0.61	-	-
Other settlements	2002.	3,597	739	20.54	614	83.09	83	11.23	0	0.00	42	5.68
	2011.	2,369	957	40.40	848	88.61	108	11.29	1	0.10	-	-
Nova Varoš	2002.	6,507	1,239	19.04	1,144	92.33	74	5.97	1	0.08	20	1.61
	2011.	4,934	1,012	20.51	850	83.99	160	15.81	2	0.20	-	-
Municipal center	2002.	3,535	317	8.97	269	84.86	36	11.36	0	0.00	12	3.79
	2011.	2,471	489	19.79	389	79.55	99	20.25	1	0.20	-	-
Other settlements	2002.	2,972	922	31.02	875	94.90	38	4.12	1	0.11	8	0.87
	2011.	2,463	523	21.23	461	88.15	61	11.66	1	0.19	-	-
Požega	2002.	12,950	4,155	32.08	2,402	57.81	1,715	41.28	1	0.02	37	0.89
	2011.	11,453	3,987	34.81	2,413	60.52	1,560	39.13	14	0.35	-	-
Municipal center	2002.	4,888	826	16.90	96	11.62	717	86.80	1	0.12	12	1.45
	2011.	4,502	1,036	23.01	299	28.86	727	70.17	10	0.97	-	-
Other settlements	2002.	8,062	3,329	41.29	2,306	69.27	998	29.98	0	0.00	25	0.75
	2011.	6,951	2,951	42.45	2,114	71.64	833	28.23	4	0.14	-	-

Tab. 7. Daily migrations of the active population performing an occupation, 2002-2011 (Milošević, 2016)

Municipality	Years	Total workers	Total migrants	Participation of migrants in the total employed population %	Daily migrants							
					In the home municipality		In another municipality		In another country		Unknown	
					Number	%	Number	%	Number	%	Number	%
Priboj	2002.	8,077	616	7.63	488	79.22	73	11.85	42	6.82	13	2.11
	2011.	7,483	1,919	25.64	1,549	80.72	352	18.34	18	0.94	-	-
Municipal center	2002.	4,995	70	1.40	7	10.00	44	62.86	15	21.43	4	5.71
	2011.	4,062	300	7.39	81	27.00	206	68.67	13	4.33	-	-
Other settlements	2002.	3,082	546	17.72	481	88.10	29	5.31	27	4.95	9	1.65
	2011.	3,421	1,619	47.33	1,468	90.67	146	9.02	5	0.31	-	-
Prijepolje	2002.	12,369	2,663	21.53	2,485	93.32	114	4.28	32	1.20	32	1.20
	2011.	11,676	3,341	28.61	3,005	89.94	308	9.22	28	0.84	-	-
Municipal center	2002.	4,596	78	1.70	22	28.21	39	50.00	8	10.26	9	11.54
	2011.	3,644	310	8.51	193	62.26	103	33.23	14	4.52	-	-
Other settlements	2002.	7,773	2,585	33.26	2,463	95.28	75	2.90	24	0.93	23	0.89
	2011.	8,032	3,031	37.74	2,812	92.77	205	6.76	14	0.46	-	-
Sjenica	2002.	9,916	836	8.43	328	39.23	55	6.58	10	1.20	443	52.99
	2011.	6,127	903	14.74	756	83.72	140	15.50	7	0.78	-	-
Municipal center	2002.	3,650	91	2.49	76	83.52	12	13.19	1	1.10	2	2.20
	2011.	3,339	379	11.35	290	76.52	82	21.64	7	1.85	-	-
Other settlements	2002.	6,266	745	11.89	252	33.83	43	5.77	9	1.21	441	59.19
	2011.	2,788	524	18.79	466	88.93	58	11.07	0	0.00	-	-
Užice	2002.	31,473	8,623	27.40	7,449	86.39	1,080	12.52	13	0.15	81	0.94
	2011.	28,011	7,768	27.73	5,602	72.12	2,150	27.68	16	0.21	-	-
Municipal center and urban settlement	2002.	23,878	4,749	19.89	3,883	81.76	806	16.97	5	0.11	55	1.16
	2011.	20,949	4,532	21.63	2,820	62.22	1,702	37.56	10	0.22	-	-
Other settlements	2002.	7,595	3,874	51.01	3,566	92.05	274	7.07	8	0.21	26	0.67
	2011.	7,062	3,236	45.82	2,782	85.97	448	13.84	6	0.19	-	-
ajetina	2002.	6,008	1,346	22.40	986	73.25	349	25.93	3	0.22	8	0.59
	2011.	5,433	2,064	37.99	1,548	75.00	515	24.95	1	0.05	-	-
Municipal center and urban settlement	2002.	2,264	569	25.13	431	75.75	138	24.25	0	0.00	0	0.00
	2011.	2,256	855	37.90	641	74.97	213	24.91	1	0.12	-	-
Other settlements	2002.	3,744	777	20.75	555	71.43	211	27.16	3	0.39	8	1.03
	2011.	3,177	1,209	38.05	907	75.02	302	24.98	0	0.00	-	-

On the basis of similar values of the volume of daily migration of workers, the fields of influence of work centres are distinguished within which, based on the intensity of daily interactions, the following zones can be distinguished (Tošić et al., 2009):

1. Zone of intense influence from which over 70% of employees daily migrate to the work centre.
2. Zone of strong influence from which 50-70% of employees migrate to the work centre daily.
3. Zone of medium influence from which 30-50% of employees migrate to the work centre daily.
4. Zones of lesser influence from which less than 30% of employed workers travel to the work centre daily. They do not have to be connected to each other, they are usually connected to the previous zones, or are enclaves within them. This zone has three subgroups: a) settlements from which 20-30% of workers travel to the work centre daily; b) settlements from which 10-20% of employees travel to the work centre; and c) settlements from which 5-10% of employees migrate to the work centre daily; and
5. The periphery of the daily urban system from whose settlements less than 5% of employed workers migrate to the centre of daily work.

Functional dependence and intensity of migration movements are based on the value of the participation of daily migrants, who travel to the work centre every day, in the total number of workers in the place of residence (2011) (Table 8).

Tab. 8. Distribution of daily migrants, municipal centres and urban settlements, 2011 (Milošević, 2016)

Municipality	Total number of daily migrants		In nodal centers											In other centers of work	
	In the municipality	In nodal centers	Arilje	Bajina bašta	Kosjeri	Nova Varoš	Požega	Priboj	Prijepolje	Sjenica	Užice	Sevojno	ajetina		Zlatibor
Arilje	2,355	1,402	1,253	0	2	0	95	0	0	0	45	4	0	3	953
%	100	59.53	53.21	0.00	0.08	0.00	4.03	0.00	0.00	0.00	1.91	0.17	0.00	0.13	40.47
%	8.61	5.12	75.94	0.00	0.22	0.00	4.13	0.00	0.00	0.00	1.10	0.19	0.00	0.33	11.38
Bajina Bašta	2,888	1,979	1	1,753	1	0	1	0	0	1	195	17	1	9	909
%	100	68.52	0.03	60.70	0.03	0.00	0.03	0.00	0.00	0.03	6.75	0.59	0.03	0.31	31.48
%	10.56	7.23	0.06	98.26	0.11	0.00	0.04	0.00	0.00	0.37	4.75	0.80	0.15	0.98	10.88
Kosjeri	1,122	841	1	0	761	0	55	0	0	0	22	2	0	0	281
%	100	74.96	0.09	0.00	67.83	0.00	4.90	0.00	0.00	0.00	1.96	0.18	0.00	0.00	25.00
%	4.10	3.07	0.06	0.00	84.18	0.00	2.39	0.00	0.00	0.00	0.54	0.09	0.00	0.00	3.35
Nova Varoš	1,012	402	1	0	0	304	0	18	48	4	13	2	5	7	610
%	100	39.72	0.10	0.00	0.00	30.04	0.00	1.78	4.74	0.40	1.28	0.20	0.49	0.69	60.28
%	3.70	1.47	0.06	0.00	0.00	80.85	0.00	1.23	1.97	1.50	0.32	0.09	0.76	0.76	7.28
Požega	3,987	2,702	333	1	98	0	1,708	0	0	0	394	153	7	8	1,288
%	100	67.77	8.35	0.03	2.46	0.00	42.84	0.00	0.00	0.00	9.88	3.84	0.18	0.20	32.23
%	14.57	9.88	20.18	0.06	10.84	0.00	74.29	0.00	0.00	0.00	9.59	7.20	1.07	0.87	15.34
Priboj	1,919	1,595	1	1	1	26	4	1,411	89	0	44	6	6	6	324
%	100	83.12	0.05	0.05	0.05	1.35	0.21	73.53	4.64	0.00	2.29	0.31	0.31	0.31	16.88
%	7.01	5.83	0.06	0.06	0.11	6.91	0.17	96.71	3.65	0.00	1.07	0.28	0.91	0.66	3.87
Prijepolje	3,341	2,397	0	0	0	37	3	26	2,295	3	30	1	1	1	944
%	100	71.74	0.00	0.00	0.00	1.11	0.09	0.78	68.69	0.09	0.90	0.03	0.03	0.03	28.20
%	12.21	8.76	0.00	0.00	0.00	9.84	0.13	1.78	94.13	1.12	0.73	0.05	0.15	0.11	11.27
Sjenica	903	276	0	0	0	5	0	0	3	258	10	0	0	0	627
%	100	30.56	0.00	0.00	0.00	0.55	0.00	0.00	0.33	28.57	1.11	0.00	0.00	0.00	69.44
%	3.30	1.01	0.00	0.00	0.00	1.33	0.00	0.00	0.12	96.63	0.24	0.00	0.00	0.00	7.49
Užice	7,768	6,209	60	29	34	2	426	2	2	1	2,992	1,910	253	498	1,556
%	100	79.93	0.77	0.37	0.44	0.03	5.48	0.03	0.03	0.01	38.52	24.59	3.26	6.41	20.07
%	28.39	22.69	3.64	1.63	3.76	0.53	18.53	0.14	0.08	0.37	72.82	89.92	38.51	54.37	18.61
ajetina	2,064	1,180	0	0	7	2	7	2	1	0	364	29	384	384	884
%	100	57.17	0.00	0.00	0.34	0.10	0.34	0.10	0.05	0.00	17.64	1.41	18.60	18.60	42.88
%	7.54	4.31	0.00	0.00	0.77	0.53	0.30	0.14	0.04	0.00	8.86	1.37	58.45	41.92	10.58
Number of daily migrants in the nodal center	18,983		1,650	1,784	904	376	2,299	1,459	2,438	267	4,109	2,124	657	916	8,376
%	100		100	100	100	100	100	100	100	100	100	100	100	100	100
%	69.38		8.69	9.40	4.76	1.98	12.11	7.69	12.84	1.41	21.65	11.19	3.46	4.83	30.62
The total number of migrants in the Zlatibor district	27,359		%												
			6.03	6.52	3.30	1.37	8.40	5.33	8.91	0.98	15.02	7.76	2.40	3.35	100

By comparing the mapped data on daily migrants (all migrants were taken into account), a complete picture of the spatial mobility of the labour force is formed in correlation with the functional area, on the basis of which a traditional hierarchical model of the city's field of influence can be formed.

In 2002, the nodal centre of Užice with 63 settlements, represented by 22.83% and Bajina Bašta (22), represented by 7.97% of all settlements of providers of daily migrants, stood out in terms of the number of settlements and the area of influence. (Table 9).

Tab. 9. Functional dependence of settlements, providers of migrants, Zlatibor District, 2002 (all settlements of the district) (Milošević, 2016)

Nodal center	≥ 5	≥ 10	≥ 20	≥ 30	≥ 50	≥ 70	Total number of functionally dependent settlements	%
Arilje	2	7	2	5	2	1	19	6.88
Bajina Bašta	7	5	2	3	5	-	22	7.97
Kosjerić	3	3	2	4	3	-	15	5.43
Nova Varoš	3	3	3	5	6	-	20	7.25
Požega	12	14	5	9	4	-	44	15.94
Priboj	1	7	3	2	-	-	13	4.71
Prijepolje	2	8	4	11	8	2	35	12.68
Sjenica	2	4	-	-	-	-	6	2.17
Užice	16	17	15	9	6	-	63	22.83
Sevojno	11	12	1	3	-	-	27	9.78
Čajetina	3	3	1	2	-	-	9	3.26
Zlatibor	1	2	-	-	-	-	3	1.09
Total number of settlements	63	85	38	53	34	3	276	62.87

Only 3 settlements in the municipalities of Arilje (1) and Prijepolje (2) had the highest degree of functional dependence, which confirms the development of a polycentric migration system and the expansion of the sphere of influence outside the municipalities.

Changes in 2011 related to an increase in the total number of settlements of providers of daily migrants (309) (Table 10) while Užice with nodal centre Sevojno remained the dominant labourer migratory centre of the district. The average representation of settlements ranged from 3.56% (Čajetina) to a maximum of 17.8% (Užice) (Figure 7). The largest increase in the size of the area of influence and functional dependence was the nodal centre of Priboj (18).

Tab. 10. Functional dependency of settlements, providers of migrants, Zlatibor District, 2011 (all settlements of the district) (Milošević, 2016)

Nodal center	≥ 5	≥ 10	≥ 20	≥ 30	≥ 50	≥ 70	Total number of functionally dependent settlements	%	Δ of the total number of functionally dependent settlements 2002 - 2011.	Δ of the total number of settlements 2002 - 2011.
Arilje	3	10	1	5	1	-	20	6.47	1	4
Bajina Bašta	3	5	1	9	3	-	21	6.8	-1	4
Kosjerić	1	3	2	11	1	2	20	6.47	5	18
Nova Varoš	2	6	5	1	-	-	14	4.53	-6	6
Požega	12	13	9	11	1	-	46	14.89	2	5
Priboj	7	6	8	4	6	-	31	10.03	18	8
Prijepolje	4	10	7	14	4	-	39	12.62	4	18
Sjenica	1	8	2	3	-	-	14	4.53	8	33
Užice	14	15	10	15	1	-	55	17.8	-8	15
Sevojno	14	4	2	1	-	-	21	6.8	-6	10
Čajetina	4	7	-	-	-	-	11	3.56	2	9
Zlatibor	7	6	3	1	-	-	17	5.5	14	19
Total number of settlements	72	93	50	75	17	2	309	100	33	149

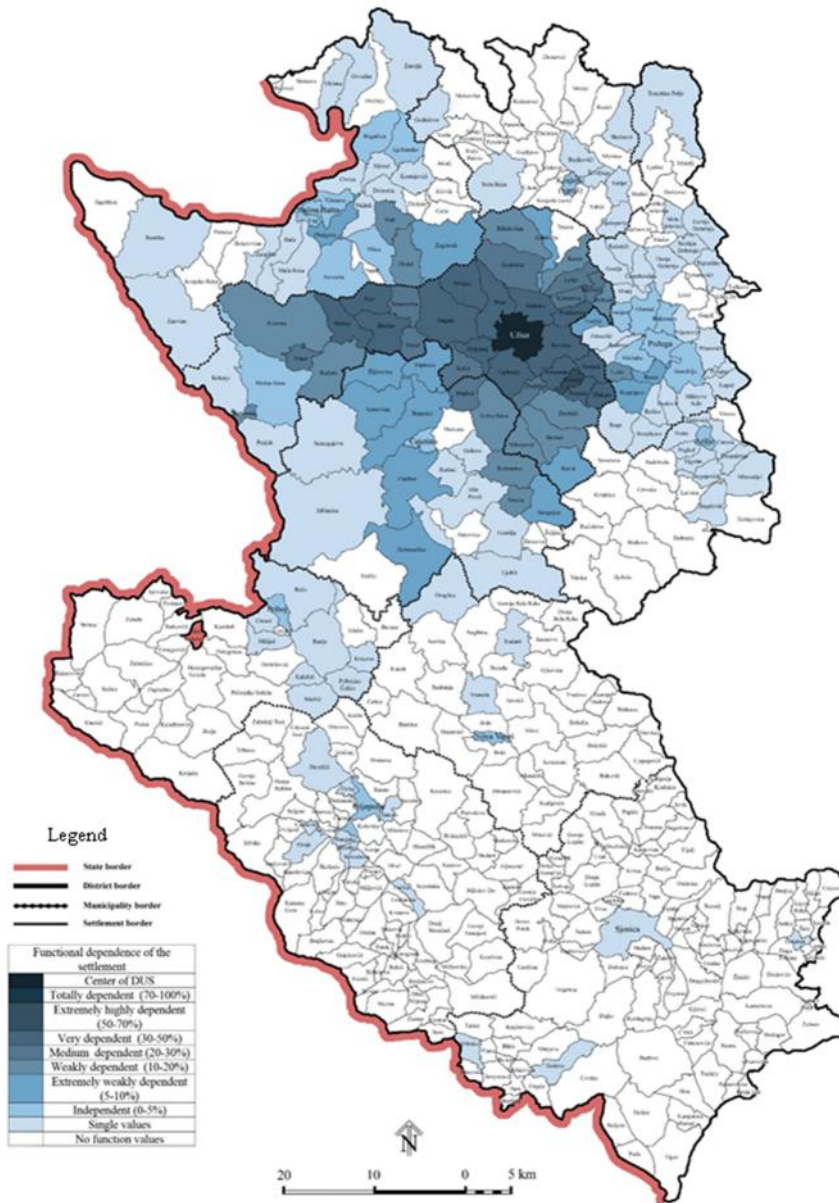


Fig. 7. Daily urban system of the nodal centre of Užice in 2011 (Milošević, 2016)

The results of the analysis of the functional dependence of the settlements in the zone of influence of the nodal centres of the district point to the conclusion that daily urban systems expanded with various changes in the functional relations of the settlements of migrant providers to the centres of work. The analysis included settlement contingents of over 5%, which was the minimum functional dependence of the settlement (extremely weakly dependent).

Changes in functional dependence are the result of differentiated influences arising from:

-) depopulation of the total number of inhabitants
-) increase in the average age of the population (decrease in the relative number of the active population in the total population)
-) transformations and restructuring of the economy (at least in the service-administrative segment)
-) reducing the number of jobs (rationalization)

The set of all factors resulted in changes that led to an increase in the daily mobility of workers, given that the possibility of employment and existence decreased in the residential centres.

The biggest changes in the number of settlements and intensity of influence were in the segment of strongly dependent parameters according to the centre of work. In both observed categories (municipal settlements and all settlements), changes were of high intensity (144.23 and 141.51 index points) (Table 11, Table 12). It is important to point out that the nodal centres increased the functional influence and the contingent of migrants, regardless of the fact that in some areas the number of settlements decreased (Arilje, Bajina Bašta, Nova Varoš, Užice and Sevojno).

Tab. 11. Changes in the functional dependence of settlements, providers of daily migrants, 2002-2011 (Milošević, 2016)

Settlements of individual municipalities				
Functional dependence of settlements according to the table	2002.	2011.	$\Delta_{2011/2002}$.	Index of changes in the number of settlements. 2011/2002.
≥ 5	38	48	10	126.32
≥ 10	73	85	12	116.44
≥ 20	36	48	12	133.33
≥ 30	52	75	23	144.23
≥ 50	34	17	-17	50.00
≥ 70	3	2	-1	66.67
Total number of functionally dependent settlements	236	275	39	116.53

Tab. 12. Changes in the functional dependence of settlements, providers of daily migrants, 2002-2011 (all settlements) (Milošević, 2016)

All settlements of the district				
Functional dependence of settlements according to the table	2002.	2011.	$\Delta_{2011/2002}$	Index of changes in the number of settlements. 2011/2002.
≥ 5	63	48	-15	76.19
≥ 10	85	93	8	109.41
≥ 20	38	50	12	131.58
≥ 30	53	75	22	141.51
≥ 50	34	17	-17	50.00
≥ 70	3	2	-1	66.67
Total number of functionally dependent settlements	276	285	9	103.26

Conclusion

In formulating the concept and perspective of sustainable development, the starting point is the interaction between a set of elements of the spatial system, such as the settlement

system of the Zlatibor district, resulting from the cause-and-effect complex of action of the functionally most important places - nodal centres.

With the development of the field of influence of nodal centres, within the settlement system, there was a spatial redistribution of the population, a change in economic activity, a change in spatial relations and connections, a strengthening of the urbanization process and the expansion of the spatial mobility of the labour force through daily migration as an indicator of the perspective of sustainable development. Based on a set of indicators, the most important determinants of the natural-geographical and social-geographical complex in the system of nodal settlements of the Zlatibor district were singled out, on the basis of which it can be concluded:

1. The configuration of the terrain, manifested by a large horizontal and vertical breakdown, prevents the compact connectivity of the space, which affects the indirect involvement of the settlement network in the spatial system of nodal centres. The majority of municipal centres, i.e. urban settlements, are located in zones of greater convenience for the development and deployment of various structures of activity, which, with the already confirmed attractiveness of the locations, achieves the expansion of the peri-urban belt through the urbanization of settlements.
2. Nodal centres represent the nuclei of the spatial concentration of the population, which intensifies the process of demographic polarization in other settlements of the district.
3. Changes in the overall structure of the population's activities indicate an intensive process of tertiarization and the equalization of this branch of activity with the second (deindustrialization). Thus, the population of traditional industrial centres focused on the field of services, while at the same time the population and areas of other settlements are under the strong influence of economic-geographical stagnation and disintegration.
4. The functional development, that is, the polyfunctional character of nodal settlements, determines the direction and possibility of sustainable socio-economic development of other settlements.
5. Based on the applied methods of research and determination of daily urban systems, the general theoretical premise of their origin, growth and development is confirmed. The daily urban systems of the Zlatibor district represent a multi-layered, heterogeneous and dynamic organization within the system of settlements whose quantitative values are manifested by changes in spatial and temporal frameworks.
6. Quantitative and qualitative characteristics of settlements in the Zlatibor district determined the role and position of nodal centres as key parameters for further development and the perspective of sustainable development of the settlement system. The key features and confirmation of the necessity of further study and confirmation of existing theories on sustainable development and incentive processes of nodal centres could be formulated on the following basis:
 -) the main areas of population concentration are urban cores;
 -) the high conditionality of the socio-economic development of the settlement system because of the existing factors limiting sustainable development;

- J today's functional-spatial development of the settlement system is based on the gravitational-incentive and polarization effects of the influence of nodal settlements;
- J the process of population redistribution within the active population, population-functional concentration and the development of a sustainable settlement system.

By guiding the development of nodal settlements on the basis of polycentrism and multinodalism, the traditional hierarchical - monocentric spatial system can be transformed into a functionally sustainable and existentially acceptable form of arrangement of the settlement system.

Conflicts of Interest: The authors declare no conflict of interest.

Publisher's Note: Serbian Geographical Society stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.

© 2022 Serbian Geographical Society, Belgrade, Serbia.

This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Serbia.

References

- Dijkstra, L., Poelman, H., & Veneri, P. (2019). *The EU-OECD definition of a functional urban area*. OECD Regional Development Working Papers. OECD Publishing. DOI:10.1787/d58cb34d-en.
- Doksijadis, K. (1982). *Čovek i grad*. Nolit.
- Đorđević, S. J. (2004). Tipologija fizičko-geografskih faktora u prostornom planiranju. *Geografski institut Jovan Cvijić*, 59, 37-44.
- Farrell, A., & Hart, M. (1998). What does sustainability really mean?: The search for useful indicators. *Environment: Science and policy for sustainable development*, 40(9), 4-31.
- Fitzpatrick, J. (2020). Target ecological limits and not economic growth. *World*, 1(2), 135-148. DOI:10.3390/world1020011
- Milivojević, M., Milošević, M., & Čalić, J. (2008). Posledice spontanog raseljavanja naselja na teritoriji Republike Srbije. *Demografski pregled*, 8, 3-4.
- Milošević, Z. (2016). *Nodalni centri – determinanta održivog razvoja sistema naselja Zlatiborskog okruga* [Doctoral Dissertation, Faculty of Geography, University of Belgrade]. <https://nardus.mpn.gov.rs/handle/123456789/6574>. 4-81975
- Natalia, V., & Heinrichs, D. (2019). How to define urban centres: Concepts overview and propose indicators. *Transportation Research Procedia*, 41, 150-154. DOI:10.1016/j.trpro.2019.09.027
- Republički zavod za statistiku Srbije. *Nepublikovani podaci Republičkog zavoda za statistiku za 1991, 2002 i 2011. godinu – zaposleni, migracije, poljoprivreda i dr.* Republički zavod za statistiku Srbije.
- Republički zavod za statistiku Srbije (1995). *Popis stanovništva, domaćinstava i stanova 1991*. Republički zavod za statistiku Srbije.
- Republički zavod za statistiku Srbije (2004). *Uporedni pregled broja stanovnika 1948, 1953, 1961, 1971, 1981, 1991 i 2002. godine*. Republički zavod za statistiku.

- Republički zavod za statistiku Srbije (2004). *Popis stanovništva, domaćinstava i stanova 2002*. Republički zavod za statistiku Srbije.
- Republički zavod za statistiku Srbije (2014). *Popis stanovništva, domaćinstava i stanova 2011*. Republički zavod za statistiku Srbije.
- Republički zavod za statistiku Srbije (2014). *Uporedni pregled broja stanovnika 1948, 1953, 1961, 1971, 1981, 1991, 2002 i 2011*. Republički zavod za statistiku Srbije.
- Stamenković, S., & Bačević, M. (1992). *Geografija naselja*. Geografski fakultet PMF.
- Tošić, D., Krunić, N., & Milijić, S. (2009). Istraživanje prostorne organizacije mreže naselja u funkciji izrade prostornog plana opština Južnog Pomoravlja. *Demografija*, 6, 173-194.
- Tošić, D., Krunić, N., & Petrić, J. (2009). Dnevni urbani sistem u funkciji prostorne organizacije Srbije. *Arhitektura i urbanizam*, 27, 35-45.
- Tošić, D., & Nevenić, M. (2007). Dnevni urbani sistem – prostorni izraz dnevne migracije stanovništva. *Demografija*, 4, 163-176.
- Yan, Y., Chenxing, W., Yuan, Q., Gang, W. & Jingzhu, Z. (2018). Urban sustainable development efficiency towards the balance between nature and human well-being: Connotation, measurement, and assessment. *Journal of Cleaner Production*, 178, 67-75. DOI:10.1016/j.jclepro.2018.01.013
- Živanović, V., Pavlović M., Kovjanić A., Tošić D., & Krstić, F. (2021). Concept of polycentricity - the differences between development policies and spatial reality. *Geografski Inisut Jovan Cvijić*, 71(1), 75–90. DOI:10.2298/IJGI2101075Z