

**Goran S. Jović**

Faculty of Philosophy,  
University of East Sarajevo,  
Bosnia and Herzegovina

✉ gorjovic@gmail.com

**Vojkan Bojović**

Primary school „Ćele Kula”,  
Niš,  
Serbia

✉ vojkan.bojovic@yahoo.com

## FUNCTIONAL TRANSFORMATION OF KOSANICA SETTLEMENTS AS AN INDICATOR OF TOURIST DEVELOPMENT

### ФУНКЦИОНАЛНА ТРАНСФОРМАЦИЈА НАСЕЉА КОСАНИЦЕ КАО ПОКАЗАТЕЉ ТУРИСТИЧКОГ РАЗВОЈА

**Summary:** *The aim of this research is the analysis of the functional transformation of Kosanica settlements as an indicator of tourism development. Kosanica is a historical and geographical area in the basin of the river of the same name in southern Serbia. There are 90 settlements in the area. Starting from the view that the functional characteristics of the network of settlements reflect the economic characteristics of the working population, the interrelations of the functional transformation of settlements are analysed in this paper on one hand, along with the tourist development on the other. The focus of the analysis is the geographical area of Kosanica and the changes in the functional structure of the settlements that are caused by the development of tourism or are of significance for the tourism development.*

**Keywords:** *Kosanica, settlement, functional transformation, functional types, tourism.*

**JEL classification:** L83, Z32

**Резиме:** *Циљ овог истраживања је анализа функционе трансформације насеља Косанице као показатељ њиховог туристичког развоја. Косаница је историјски и географски крај у сливу истоимене реке у јужној Србији. На њеном простору егзистира 90 насеља. Полазећи од става да у функционалним карактеристикама мреже насеља су одсликане привредне одлике радно активног становништва, у овом раду, кроз одговарајући експликативни оквир анализира се међуоднос функционалне трансформације насеља, с једне стране и туристичког развоја истих, са друге. У фокусу анализе је географски простор Косаничког краја и промене у функционалној структури насеља које су узроковане развојем туризма или су од значаја за развој туризма.*

**Кључне ријечи:** *Косаница, насеља, функционална трансформација, функционални типови, туризам.*

**ЈЕЛ класификација:** L83, Z32

## 1. INTRODUCTION

Through the history, the Serbs formed a specific geographical area - Kosanica. It is located in the basin of the river of the same name in southern Serbia, in the foothills of *Kopaonik*, *Sokolovica*, *Majdan* and *Radan* mountains, and it is a very interesting territorial fragment in the tourist-geographical sense. Nature was generous towards a relatively small area of 952 km<sup>2</sup> (1% of Serbia's surface), located between *Kosovo*, *Jablanica*, *Rasina* and the lower part of *Toplica*. The abundance of thermal mineral springs resulted in the formation of three spa centres: *Prolom*, *Lukovska* and *Kuršumljija Spa*. The morphology of the terrain produced a picturesque landscape alternating river valleys, depressions, erosion expansions, mountains, hills and highlands that create an area of excellent ecological characteristics, with world-famous geomorphological curiosity – *Đavolja varoš* (Eng. Devil's Town). In such an area, people have left significant traces of tangible and intangible cultural heritage, from prehistoric times to the present day. The Serbs found inspiration to establish their statehood here - in the first Serbian capital, *Toplica*, and later *Bela Crkva* (today's *Kuršumljija*).

Such attraction values initiated the development of contemporary tourism, especially balneological tourism, in the 1970s. The aim of this research is to analyse, through the explicit

framework of functional geography of settlements, changes in the functional characteristics of the settlement network of the Kosanica region as an indicator of their tourism development.

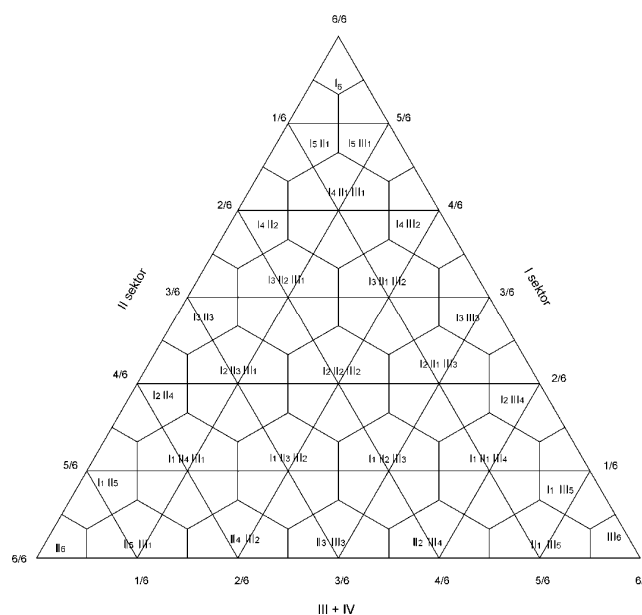
The Kosanica settlement network is a hierarchical set of 90 elementary units (settlements), characterized by great diversity in terms of size, morphology, genesis and function. Two of the settlements are no longer populated. According to the 2011 census, there were 19 213 inhabitants in the rest of the settlements. The average population density (20 inhabitants / km<sup>2</sup>) is well below the national average (102 inhabitants / km<sup>2</sup>), and the average density per settlement is 4.5 times lower than the Serbia's average. From the founding to the recent times, Kosanica settlements have undergone several developmental stages. They also have different levels of spatial and functional connectivity with the narrower and wider surroundings. These levels correspond to the individual stages of their settling development. The highest level, which is the most significant for our research, coincides with the modern stage of development. The positive socio-economic development of the Kuršumlija Municipal Centre has recently caused many changes and initiated an abundance of developmental tendencies in the rural settlements of Kosanica, both positive and negative. They are visible in all important segments of the settlements (demographic, morpho-physiognomic and functional). In this paper we only analysed some functional changes and tendencies, which are important for tourism, or are caused by tourism.

## 2. FUNCTIONAL TRANSFORMATION OF THE KOSANICA SETTLEMENTS

The differentiated genesis and socio-economic development processes of some settlements have led to the formation of their specific functions, which they fulfil in the regional structure. These functions derive from the type and scope of activity of the active population of a given settlement. 'The expression of the analysed functions, which is subject to statistical quantification, is the structure of the active population in a given settlement unit, which represents the main directions of their socio-economic activity, which changes in the period analysed and which is realized in a different stage of spatial reach' (Grčić 1999, 4).

Based on the complexity of the functional structure, expressed by the structure of the active population grouped by activity, functional types of settlements can be distinguished. There are different methods of functional classification of settlements. The ternary diagram method seems to be the most appropriate for our research.

*Graphic. 1 Ternary Diagram Model*



Source: Jović 2005, 93

For the analysis purpose, we grouped the activities into three sectors - primary (agriculture, forestry), secondary (industry and mining) and tertiary plus quaternary (various services). Thus the structure of the Kosanica settlements' activity can be represented graphically in the form of a ternary diagram. Each side of the diagram shows the percentage (0 - 100%) of a particular sector, and its position in the triangle field depends on the combination of percentages in the structure of each settlement. Grouping or typology of settlements is done by dividing the field according to a certain criterion. This raises the problem of the criteria for dividing the triangle field. We decided to divide the triangle into sectors that meet the geometric and arithmetic criteria, i.e. to divide it into regular hexagons (Graph No. 1) by dividing the sides of the triangle into sixths and then drawing vertical lines parallel to the height of the triangle which then form a grid of hexagons. Lines drawn from the divisions of the sixths, parallel to the sides of the triangle will pass through the centres of thus obtained hexagons. This means that the centres of the hexagons are typological points, and the hexagons around them are typological fields. The typological point shows how many sixths participate in the structure of primary, secondary, tertiary + quaternary sectors of activity. Thus, 28 typological points are obtained, along with their typological fields, which are named after a combination of the sixths of three sectors within them (Jovic 2005: 94).

We have opted for the presented method for several reasons:

1. It takes into account the combination of functions in the structure (diversification) of an activity, not just specialization based on a leading function;
2. From the 6/6 combination it can be seen which is the leading function in the structure;
3. It allows for the objectivity and obviousness of the functional typology.

The disadvantage is that the accuracy decreases at the angles of hexagons of typological fields due to the deviation of the sides of the hexagons from the triangle. This discrepancy is necessary in order to eliminate interstitial space.

The main economic activity until the 1960s was agriculture, predominantly extensive with low yields due to poor soil fertility and lagging cultivation. Livestock farming was the most important sub-branch in agriculture, which means that Kosanica as a whole had a distinct agrarian character. The development of the industry on the basis of local raw materials began then, which helped the strong development of the Forest-industrial *Kopaonik* combine, with over 2000 workers. *Metalac* (metal industry), *7. Juli* (textile industry), *Napredak* (construction industry) and *Frunik* (manufacturing) were also developed. The economy has entered a period of stagnation since the mid-1980s, and it also faced a major crisis with the breakup of Yugoslavia. Because of the natural resources, spa tourism, which is still on the rise (Bojović 2018, 135), has gained an important place in the economy of the municipality of Kuršumlija in the last three decades.

*Table 1 General functional types in the ternary diagram and their representation in the Kosanice settlement system in 1991 and 2011.*

Structure type	Name of the type	Number of settlements with active population	
		1991.	2011.
		88	73
I <sub>6</sub>	Specialized agrarian	27	12
I <sub>5</sub> + II <sub>1</sub>	Extremely agrarian with industrial involvement	21	2
I <sub>5</sub> + III <sub>1</sub>	Extremely agrarian with services involvement	13	4
I <sub>4</sub> + II <sub>2</sub>	Agrarian with industrial involvement	2	-
I <sub>4</sub> + III <sub>2</sub>	Agrarian with services involvement	3	3
I <sub>4</sub> + II <sub>1</sub> + III <sub>1</sub>	Agrarian with industry and services involvement	9	2

I <sub>3</sub> + II <sub>3</sub>	Equally industrial and agrarian	1	3
I <sub>3</sub> + III <sub>3</sub>	Equally service and agrarian	1	3
I <sub>3</sub> + II <sub>2</sub> + III <sub>1</sub>	Agriculture - industry - service	4	2
I <sub>3</sub> + II <sub>1</sub> + III <sub>2</sub>	Agriculture – service - industry	2	3
I <sub>2</sub> + II <sub>4</sub>	Industry with agrarian involvement	-	1
I <sub>2</sub> + II <sub>3</sub> + III <sub>1</sub>	Industry - agriculture - service	2	-
I <sub>2</sub> + II <sub>1</sub> + III <sub>3</sub>	Service - agriculture - industry	-	4
III <sub>4</sub> + I <sub>2</sub>	Services with agrarian involvement	-	3
I <sub>2</sub> + II <sub>2</sub> + III <sub>2</sub>	Mixed	3	3
I <sub>1</sub> + II <sub>5</sub>	Highly industrial with agrarian involvement	-	-
I <sub>1</sub> + II <sub>4</sub> + III <sub>1</sub>	Industry with involvement of agriculture and services	-	-
I <sub>1</sub> + II <sub>3</sub> + III <sub>2</sub>	Industry – service - agriculture	-	-
I <sub>1</sub> + II <sub>2</sub> + III <sub>3</sub>	Service - industry - agriculture	-	-
I <sub>1</sub> + II <sub>1</sub> + III <sub>4</sub>	Services with industrial and agricultural involvement	-	-
I <sub>1</sub> + III <sub>5</sub>	Extreme service activities with agrarian involvement	-	1
II <sub>6</sub>	Specialized industrial	-	3
II <sub>5</sub> + III <sub>1</sub>	Highly industrial with service involvement	-	3
II <sub>4</sub> + III <sub>2</sub>	Industry with service involvement	-	4
II <sub>3</sub> + III <sub>3</sub>	Equally industry and service	-	3
II <sub>2</sub> + III <sub>4</sub>	Service with industrial involvement	-	4
II <sub>1</sub> + III <sub>5</sub>	Extreme service activities with industrial involvement	-	3
III <sub>6</sub>	Specialized services	-	7

Source: RZS 2011b

Of the total of 90 settlements, there were 88 settlements with the active population in 1991, because Gornja and Donja Mikuljana were processed as one unit and the mountain village of Vukojevac had no inhabitants. In 2011, only 73 settlements had active population. According to the presented ternary diagram, orientation towards non-agricultural functions increased gradually in Kosanica settlements in the period from 1991 to 2011. In 1991, out of the total active population in non-agricultural activities, 3116 or 29.7% worked in industry and mining; 1079 or 10.3% worked in trade, crafts, tourism and hospitality domains; 344 or 3.3% of the population worked in the fields of education and culture; and 696 or 6.6% of people worked in construction, transport and communications. Other activities, including health and social care, housing and communal services, finance and various other services, employed 862 or 8.2% of workers. Settlements that specialize in non-agricultural functions can be considered as functional centres (Tables 3 and 4). According to the 2011 census report, there were 1365 or 29.4% of those working in industry and mining, which is two times less than in 1991. 707 or 15.2 % of people worked in trade, crafts, tourism and hospitality; 438 or 9.5% in education and culture; 414 or 8.9% in construction, transport and communications and 1230 or 26.5% in other activities (health and social care, housing and communal services, finance).

*Table 2 Active population of Kosanica by sectors in 1991 and 2011*

Year	Total number of active population	Primary sector		Secondary sector		Tertiary + Quaternary		Unknown	
1991.	10.492	4.384	41,8%	3.473	33,1%	2.624	25%	11	
2011.	4.637	483	10,4%	1.526	32,9%	2.616	56,4%	12	

Source: RSZ 2011a

The biggest problem with the economic development of the Kosanica area is a big (over 50%) decrease in the number of active population in the analysed period. This is the result of negative demographic developments that can be assessed through a typology of general population movement. Through the analysis and evaluation of the functional

transformation of the Kosanica settlement, it can be concluded that the centrality of the settlement depends more on the structure of the active population than on its population size.

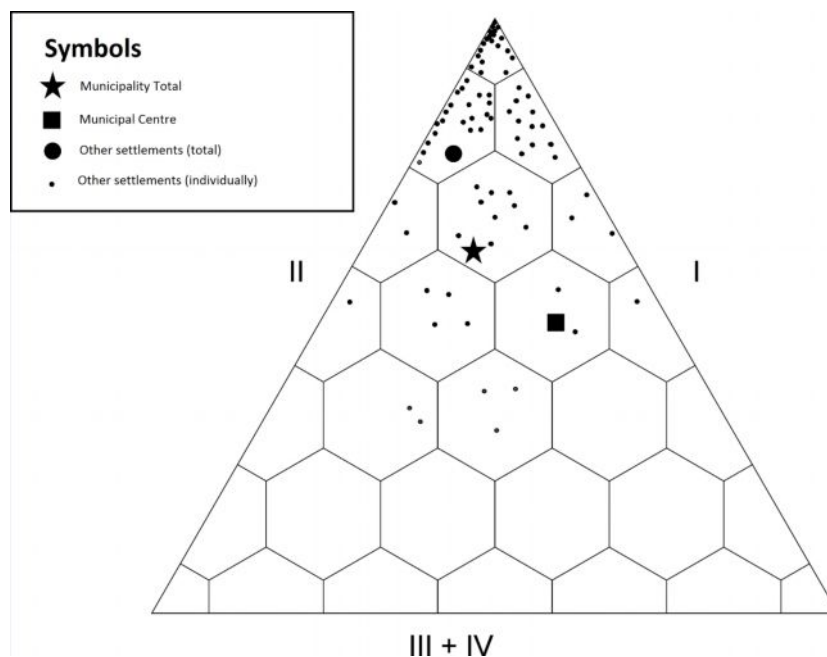
*Table 3 Active population of Kosanica by activities in 1991 and 2011*

Year	1991		2011	
Agriculture, forestry, hunting and fishing	4.384	41,8%	483	10,4%
Industry, mining	3.116	29,7%	1.365	29,4%
Trade, crafts, tourism and hospitality	1.079	10,3%	707	15,2%
Education, culture	344	3,3%	438	9,5%
Construction, transport and communications	696	6,6%	414	8,9%
Health, social care, housing and communal services, finance and more	862	8,2%	1.230	26,5%
Unknown	11		12	

Source: RRZS 2011a

Increased importance of the secondary and tertiary activities in relation to the primary sector, conditioned the process of restructuring activities, i.e. deagrarization, so that in 1991 4384 people or 41.8% of the total number of active population worked in agriculture, but the number fell down to 483 or 10.5% in 2011. It shows that secondary and tertiary activities occupied the leading economic function of this region, meaning that non-agricultural activities employed a total of 6097 workers or 58.2% in 1991, while 4154 workers or 89.5% of the total active population worked in the non-agricultural sector according to the 2011 census. The increase is partly a result of the service activities development, but also a result of the large population outflow, not only from rural settlements in the hills and mountains, but also from the municipal centre of Kuršumlija, i.e. the result of the overall decrease in Kosanica population (extreme depopulation). According to the 2011 census, the total number of active population decreased by 2.3 times compared to 1991, so that the number of workers in the primary sector decreased by 9 times and by 2.3 times in the secondary, while in the tertiary sector it remained almost the same.

*Graphic 2 Functional types of settlements in the municipality of Kuršumlija (1991)*

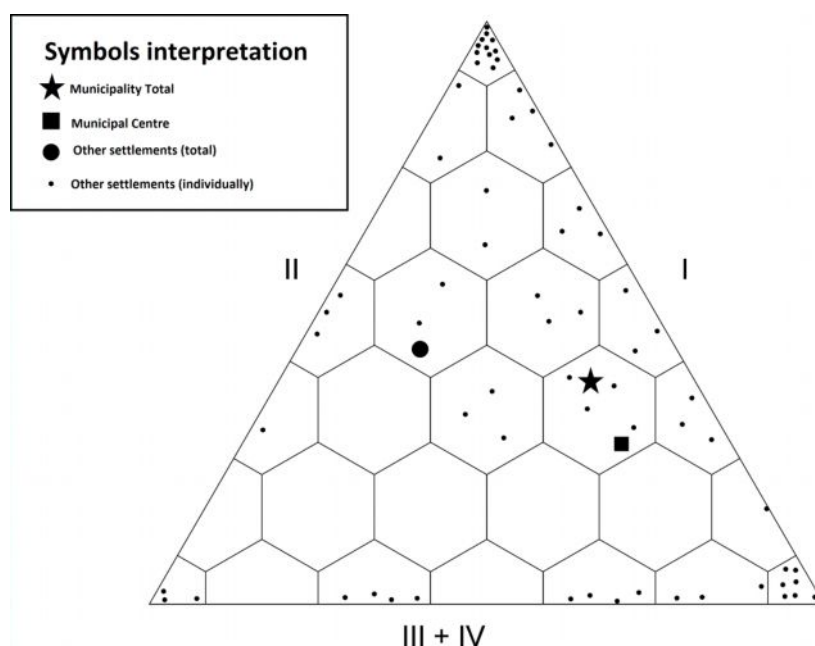


Source: Authors visualisation

As can be seen from Table no. 1, in 1991 there were only 7 settlements of non-agrarian type (equally industrial and agrarian type - Prevetica; equally service and agrarian type - spa-tourist resort of Kuršumlija; industry-agriculture-service type - suburban settlements of Kastrat and Markoviće, and mixed types - municipal center of Kuršumlija, suburban settlement of Pepeljevac and rural village of Rača; followed by 6 semi-agricultural settlements: agrarian-industrial-service types: Bogujevac, Merdare, Baćoglava and Markoviće and agrarian-service-industrial type: Barlovo and Lukovo spa. The other 75 settlements were more or less of agrarian type. According to the 2011 census there were 42 settlements of non-agrarian type and 5 settlements of semi-agrarian type, namely: equally industrial and agrarian type: Gornje Točane, Parada and Nevada; equally service and agrarian type: mountain settlements of Mrče, Đake and Vlahinja; industry with agrarian involvement - Kosmača; service-agrarian-industrial type: Krčmare, suburban settlements of Kastrat and Bećoglava and Kuršumlija city center; mixed type: suburban settlements of Mačkovac and Belo polje and Spance. Extreme service activities with the agrarian involvement: Prolom spa-tourist center; specialized industry: Dabinovac, Svinjište and Ravni Sort, highly industrial with services involved: Štava, Lukovo spa center and Selova; industry with services involved: Trebinje, Pljakovo, Iris and Matarov; Equally industry and service: Ljuša, Dedinac and suburban Markoviće; service with industry involvement: Tijovac, Kuršumlija Spa, Rudare and Samokovo; extreme service activities with industrial involvement: Degrmen, a suburban settlement of Pepeljevac and Kosanicka Rača, and special services: Kupinovo, Zagrađe, Barlovo, Ivan Kula, Žalica, Novo selo and Merćez. The five semi-agricultural types are: agrarian-industrial-services - Žuč and Maričić and agrarian-service-industrial - Grabovnica, Mikuljana (Upper and Lower) and Dobri Do. The rest of the settlements (26) are more or less agrarian.

The expansion of the municipal centre of Kuršumlija's influence, tourist and spa resorts of Kuršumlija, Lukovska and Prolom spa, the geomorphological phenomenon of Devil's Town and the increasing mobility of the population affect the processes of restructuring (deagrarianization, industrialization, tertiarization) of the activities, concentration (urbanization) of the population and economic differentiation (polarization) of the settlements network.

*Graphic 3 Functional types of settlements in the municipality of Kuršumlija (1991)*



Source: Authors visualisation

### 3. RESULTS AND DISCUSSION

Functional types of settlements do not depend on the size of the settlement but on the processes, which are intense in the municipal centre, spa resorts, suburban settlements and rural centres at the cross roads. Kuršumlija is a crossroad from which roads lead towards Prokuplje, Priština, Kruševac and Medveđa. The influence of the municipal centre of Kuršumlija extends along these roads. The Niš-Prokuplje-Kuršumlija-Priština road represents an axis for the development of a number of Kosanica settlements (they were built directly along the road or on a short distance from it). There is an increase in the share of non-agrarian population and daily migrants in those settlements. Extremely agrarian settlements predominate in more remote and isolated areas and at higher-altitudes rural settlements. They are characterized by a high share of solely agricultural households and by a small share of the active population involved in non-agricultural activities (Map number 1). Emigration of the population is more pronounced, which causes depopulation, extreme depopulation and even dying out of the population of some rural settlements (Table no. 5).

*Table 4 Non-agrarian settlements as centres in the Kosanica settlements network 1991 and 2011*

Type	1991			2011		
	Number of settlements	Population	Number of households	Number of settlements	Population	Number of households
I <sub>3</sub> II <sub>3</sub>	1	41	15	3	40	24
I <sub>3</sub> III <sub>3</sub>	1	185	70	3	150	70
I <sub>3</sub> II <sub>2</sub> III <sub>1</sub>	4	1054	332	2	214	92
I <sub>3</sub> II <sub>1</sub> III <sub>2</sub>	2	449	152	3	383	124
I <sub>2</sub> II <sub>4</sub>	-	-	-	1	57	39
I <sub>2</sub> II <sub>3</sub> III <sub>1</sub>	2	701	198	-	-	-
I <sub>2</sub> II <sub>1</sub> III <sub>3</sub>	-	-	-	4	13757	4574
I <sub>2</sub> II <sub>2</sub> III <sub>2</sub>	3	13073	3841	3	546	229
I <sub>1</sub> III <sub>5</sub>	-	-	-	1	131	60
II <sub>6</sub>	-	-	-	3	117	49
II <sub>5</sub> III <sub>1</sub>	-	-	-	3	441	175
II <sub>4</sub> III <sub>2</sub>	-	-	-	4	199	89
II <sub>3</sub> III <sub>3</sub>	-	-	-	3	286	121
II <sub>2</sub> III <sub>4</sub>	-	-	-	4	427	181
II <sub>1</sub> III <sub>5</sub>	-	-	-	3	306	122
III <sub>6</sub>	-	-	-	7	320	126
total	13	15503	4608	47	17374	6075
% of total number	14,5	65,7	59,8	52,3	90,5	85,5

Source: RZS 2011b

Based on the proposed qualitative classification of the functional structure of settlements, it can be concluded that settlements belonging to the same category are also characterized by some similarity, but at the same time they differ in terms of the proportion of the socio-economic potential at their disposal. The proportion of socio-economic potential and the extent of functional influence can therefore be a criterion for isolating settlements of different hierarchical levels of functions, i.e. different levels of centrality can be singled out.

*Table no. 5 - Zonal distribution of settlements and population in Kosanica in relation to the municipal centre in 1961, 1991 and 2011.*

Distance in km	Number of settlements	%	Population in 1961		Population in 1991		Population in 2011	
			number	%	number	%	number	%
Up to 5	9	10,1	3452	9,3	2191	9,3	1192	6,2
5 – 10	15	16,9	5393	14,6	1785	7,5	1110	5,8
10 – 15	13	14,6	6942	18,8	2257	9,5	1191	6,2
15 - 20	9	10,1	4738	12,8	1097	4,6	589	3,1
20 – 30	20	22,5	5456	14,8	1388	5,9	783	4,1
Over 30	23	25,8	7824	21,2	2347	9,9	1148	6,0

Source: RZS 2011a

The scope of the functional impact of settlements is dominated by two functions - manufacturing and services. Small settlements, with specialized industrial function, are being developed as mono-functional on the basis of a single manufacturing firm with unique production. For example, Prolom settlement with the Prolom water plant has production connections in Serbia, European countries and even countries on other continents, which means that it has international connections. As a small multifunctional centre, Kuršumljija also has production connections not only in the municipality and the district, but throughout Serbia.

Among the services, the most advanced are the tourism and recreational functions, which are concentrated in Kuršumljija, Lukovska and Prolom Spas and in the geomorphological phenomenon in the village of Đake - Đavolja Varoš. Other activities, characterized by establishments and institutions of municipal (education, culture, judiciary and other) and local importance, are concentrated in the municipal centre in Kuršumljija. Kuršumljija may become a larger and stronger centre, but it has been economically stagnating significantly over the last 30 years, and the departure and decline of the population has further hampered the economic and social development of this centre.

The settlements of lower functional status are characterized by establishments and institutions that often occur in the socio-economic space and meet the daily needs of the population. Thus, settlements with agrarian-service functions have a huge range of influence from the village community to the municipality level.

Finally, we can conclude that the presented analysis of the functional transformation of the settlements of the Kosanica region indicates that tourism is the best and most efficient activity for the future economic growth of this region. In the settlements where the tourism function developed as part of their economic development, the negative demographic processes were either slowed down or stopped completely. Future development should go in this direction.

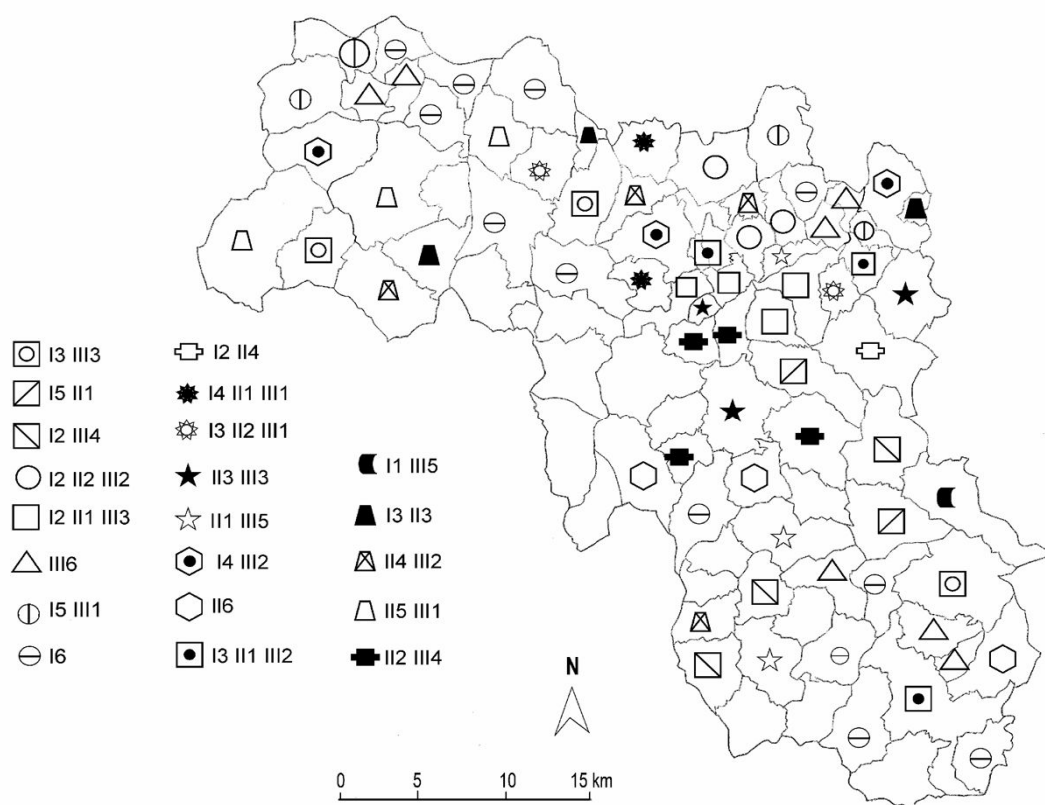


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## APPENDIX

Map 1 Functional types of Kosanica settlement 2011



Source: Authors visualisation