SMALL AND MEDIUM-SIZE TOWNS AS THE BASIS OF POLYCENTRIC URBAN DEVELOPMENT

MAJHNA IN SREDNJE VELIKA MESTA KOT OGRODJE POLICENTRIČNEGA URBANEGA RAZVOJA

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ABSTRACT

The paper discusses the role of small and medium-size towns in the polycentric settlement network of Slovenia. The roles of settlements in a network are affected not only by the number of inhabitants in a settlement or region, but also by several other factors. The paper, therefore, focuses especially on the set of indicators that would delineate the difference between large, medium-size and small settlements in Slovenia as well as in comparison to other European countries. The research approach to the topic is introduced, including the design of an analytical model, whereby the findings of previous studies are used on a comparative basis. The most significant results of a survey on the role of the settlements in a network are presented. The study was performed in two parts. In the first part, a quantitative analysis at the national scale was performed, based on the defined indicators, and in the second part a qualitative analysis of the survey was performed. Having used thirteen indicators, we first distinguished between the settlements to be considered as towns and between other kinds of settlements in the territory of Slovenia. The same indicators were further used to distinguish between large, medium-size and small towns. Based on the analysis, an assessment of the role of individual small and medium-size towns in different regions is given. The qualitative approach also gave certain answers regarding the actual and potential connection of urban settlements into conurbations, which have been partly defined in the national legislation.

KEY WORDS

small towns, medium sized towns, urban settlements, urban settlements network, polycentric urban development, Slovenia

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POVZETEK

V prispevku je obravnavana problematika vloge majhnih in srednje velikih mest v policentričnem omrežju naselij v Sloveniji. Na vlogo posameznih naselij v omrežju naselij vpliva več dejavnikov, ne le število prebivalcev v naselju ali regiji. V prispevku je zato poseben poudarek na izboru kazalnikov, s katerimi bi lahko opredelili razliko med velikimi, srednje velikimi in majhnimi mesti, posebej v Sloveniji in v primerjavi z drugimi evropskimi državami. Predstavljen je raziskovalni pristop k tematiki in oblikovanju analitičnega modela, pri čemer so primerjalno uporabljeni izsledki predhodnih raziskav. Predstavljeni so pomembnejši rezultati ankete o vlogi obravnavanih naselij v omrežju. Raziskava je bila izvedena v dveh delih. V prvem delu smo izvedli kvantitativno analizo na nacionalni ravni, na podlagi opredeljenih kazalnikov, v drugem pa smo izdelali kvalitativno analizo anketnih vprašalnikov. S pomočjo trinajstih opredeljenih kazalnikov smo za Slovenijo najprej določili razmejitev med naselji, ki jih prištevamo med mesta, in ostalimi naselji. S pomočjo istih kazalnikov smo nadalje določili razmejitev med velikimi, srednje velikimi in majhnimi mesti. Na osnovi izdelane analize je podana ocena vloge posameznih majhnih in srednje velikih mest po regijah. Kvalitativni pristop omogoča tudi odgovore glede dejanskega in potencialnega povezovanja mestnih naselij v somestja, deloma že opredeljena v državnih dokumentih.

KLJUČNE BESEDE

majhna mesta, srednje velika mesta, mestna naselja, omrežje naselij, policentrični urbani razvoj, Slovenija

1 INTRODUCTION

The settlement network represents one of the basic spatial structures, being, in its nature, one of the most stable elements in space (Zavodnik Lamovšek, 1997). In general, we distinguish between urban and rural settlements. There is a gap among them in terms of the infrastructure and activities satisfying the needs of the inhabitants. In Slovenia, this gap is rather significant, despite the definitions of coherent spatial development that were adopted as early as in the 1970's (Resolucija o poglavitnih smotrih in smernicah za urejanje prostora, 1973) and which were based on a polycentric model at the national level. Recently, polycentric spatial development has been strongly emphasized in the broader European space, since it underlines territorial integrity and spatial cohesion in a common European territory, next to social balance and economic competition (ESDP, 1999).

The Slovenian urban network evolves around 15 centres of national and transnational importance, including five conurbations, as well as 20 intermunicipal centres (SPRS, 2004). Taking into account all the settlements – with the exception of Gornji Petrovci with less than 1000 inhabitants, they are defined as centres of intermunicipal importance in the Spatial Development Strategy of Slovenia (hereinafter SPRS, 2004) – altogether there are 61 (Figure 1). These centres, or at least some of them, are too weak to function independently as a central settlement in the urban network of Slovenia. Competition can be achieved only by cooperation with other centres at the regional and local levels. Such an urban area of two or more neighbouring centres is considered as a whole in the national urban network. The question arises about the success of urban areas with two or more centres as compared to similar areas with one single centre. In this respect it is important to define urban centres based on their size, role and importance in the polycentric urban network, which is especially true for small and medium-size towns (hereinafter called SMESTOs).

The current role of SMESTOs is strongly influenced by the socio-economic factors, such as globalisation, growth of the tertiary sector and the ongoing and future structural changes. These are the reason that many towns are losing their influence and have to deal with problems, such as unemployment and reduction of work places, lagging behind in infrastructure, facing poor institutional structure etc. In Slovenia, only Ljubljana is considered a large town (ESPON 1.1.1., 2004; ESPON 1.1.3., 2004), and it therefore cannot take on itself all the activities necessary for polycentric spatial development. Therefore, SMESTOs represent a great potential in ensuring a quality way of life in urban environments and their rear parts. The key shortcoming of the Slovenian settlement system is precisely the lack of medium-size towns that would provide a solid framework for a polycentric spatial development. Therein is the origin of our thesis, that is, *that the network of small and medium-size towns is the key framework for realization of the goals of sustainable polycentric spatial (urban) development at all levels*.

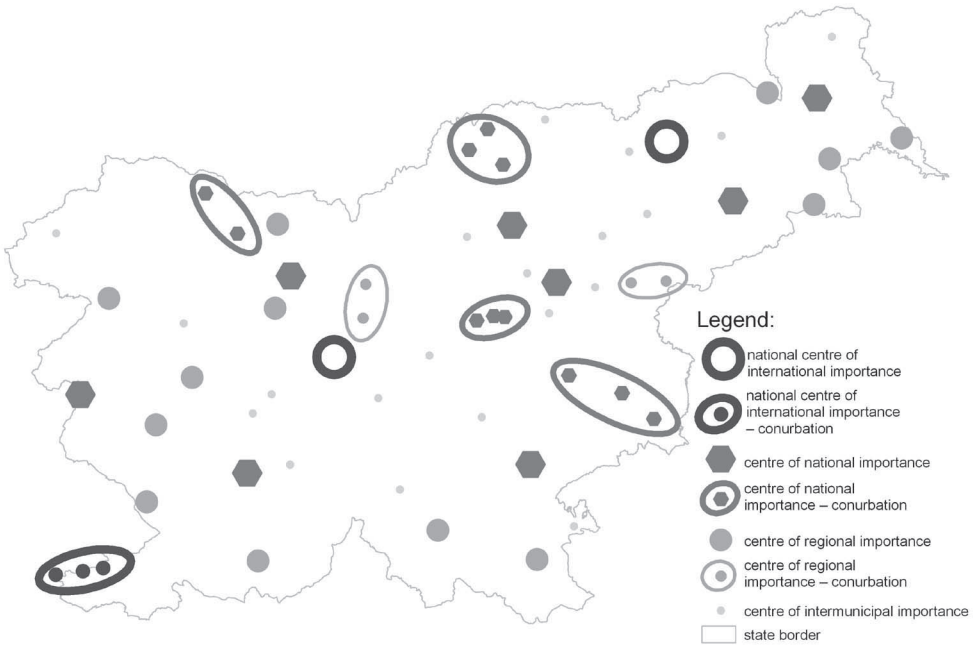


Figure 1: *Polycentric urban system with a hierarchy of centres and conurbations (source: MOP, 2004).*

The aim of the paper is to show the current role of SMESTOs related to the polycentric development of Slovenia, to define their integration into the urban network, its structural and functional connectedness, as well as the actual and potential scope of co-operation at the intermunicipal level. First, SMESTOs had to be defined using different criteria and indicators. In doing so, size was taken as one of the key indicators, but it was not the only indicator considered. The definition of SMESTOs was built around the fact that the criteria and indicators cannot be absolute, since they depend on the social and economic conditions in the areas where the SMESTOs are defined. Therefore, the selection of the criteria and indicators had to be adapted to Slovenian conditions, at the same time taking into account international research and other important sources[1].

The quantitative definition of SMESTOs was followed by the definition of the role and significance in the urban network from the quality aspect, which was achieved by different methodological steps, which are presented in the second part of the paper.

2 WORK METHODOLOGY AND ANALYTICAL MODEL

The problem domain is of interest not only for Slovenia, but also elsewhere, especially in the European Union (EU), where it has been recognized that the European urban network cannot be based on a few exposed metropolitan areas only (ESPON 1.1.1, 2006), but must ensure its

[1] *All relevant domestic and international studies and other sources relevant to this study are discussed in the paper several times and given in the References section, therefore here they are not referred to separately.*

polycentric development through the SMESTO network (ESPON 1.1.1, 2006; RePUS, 2006). Therefore we approached the analysis of SMESTOs[2] with a two-stage research, which, on the one hand, enables the comparability of the results gained in the European space (RePUS, 2006; ESPON 1.4.1, 2006; CONSPACE, 2005; Urban Audit, 2006; and others), while, on the other hand, it gives an in-sight into the conditions in the Slovenian urban network (Pavlin et al., 2003; Ravbar, 2003; Vrišer, 1995; and others).

Table 1 shows the methodological approach to the study. It lines up the working steps which partly followed consecutively, while partly they overlapped or intertwined through the entire course of SMESTO definition and identification of their role in the urban network. The research was performed at two spatial levels using two approaches. The paper presents the results obtained at the macro level, while the case studies are discussed elsewhere for brevity reasons.

		ANALYTICAL APPROACH	
		Qualitative analysis	**Quantitative analysis**
SPATIAL UNIT	**Analysis of SMESTOs in the national urban network – macro level** (possibility of comparison with other EU countries)	- survey (questionnaire) - description of urban network with an emphasis on SMESTOs (institutional framework)	- data analysis at the municipal level (region) and settlement – considering the methodology and the selection of indicators from domestic and foreign research and studies
	Case study – micro level (considering the particularities of the Slovenian urban network)	- SWOT analysis - descriptive data for the cases chosen	- data analysis at the level of a settlement – selection of criteria for the definition of the urban area (independent of the spatial unit register)

Table 1: *Analytical steps of the proposed methodology (Prosen et al., 2007b).*

2.1 Macro research: analysis of small and medium-size towns at the national level

Quantitative and qualitative analyses at the macro level were performed for the entire urban network of Slovenia (see Table 1). The quantitative analysis was based on the selection of indicators and criteria for definition of SMESTOs, which was designed with a comparative examination of relevant domestic and foreign studies

(Pavlin et al., 2003; Ravbar, 2003; Vrišer, 1995; RePUS, 2006; ESPON 1.4.1, 2006; CONSPACE, 2005; Urban Audit, 2006). In this way, we ensured the comparison of SMESTOs of the Slovenian urban network with those of other European countries.

[2]*The research was carried out within the Target Research Programme » Slovenian Competitiveness 2006–2013«, performed jointly by the Faculty of Civil Engineering and Faculty of Arts of the University of Ljubljana, and the Faculty of Civil Engineering of the University of Maribor.*

For SMESTO determination, 104 urban areas were considered in the analysis, including the urban areas of Ljubljana and Maribor. The criteria and indicators were adapted to small and, separately, for medium-size towns. The criteria used can be classified into three groups: formal, physiognomic/morphologic and functional. They were designed in a way to ensure that the large urban areas could not significantly influence the objectivity of the rest results. We presumed that the boundary between the small and the medium-size towns was not known. Also, instead of a sharp boundary, we assumed that between the town and its environment a wide transitional space called the suburbs was present, which have recently undergone a great change. Since the town and its suburbs are strongly connected, they were dealt with together as an urban area (e.g.

Criteria	**Indicator**	**Average for 104 towns considered in the analysis**	**Border value chosen**
Formal	1. Number of inhabitants	9436	$\geq$ 3000
	2. Migration of inhabitants 2003–2005	0%	$\geq$ 0%
Physiognomic/morphologic	3. Number of dwellings per building	2.3	$\geq$ 2.3%
Functional	4. Number of inhabitants per work place	2.1	$\leq$ 2.1
	5. Share of active daily commuters to urban areas	64%	$\geq$ 64%
	6. Health care centre	89/104	Yes/No (1/0)
	7. Pharmacy	98/104	Yes/No (1/0)
	8. Primary school	103/104	Yes/No (1/0)
	9. Bank	94/104	Yes/No (1/0)
	10. Administration establishments	95/104	Yes/No (1/0)
	11. High school or vocational, technical and secondary professional schools	35/104	Yes/No (1/0)
	12. Share of the persons employed in services	54%	$\geq$ 54%
	13. Share of inhabitants with higher and university	14%	$\geq$ 14%

Table 2: *Criteria, indicators and their border values for determination of small towns in Slovenia (Prosen et al., 2007a).*

Maribor with suburban settlements, which have already become its integral part, cf. Pavlin et al. 2003), which also included all the changes at the town–suburbs level.

The determination of small towns was performed using 13 indicators (Table 2), and each of them was assigned one point. There was a border value for each indicator, which was the basis for allocation of points to the analysed urban areas. The urban area that fulfilled all the criteria would gather a total of 13 points maximum. The border values were, due to the different kinds of indicators, determined in three ways. For the indicator of the number of inhabitants the border value was determined by using the domestic and foreign sources, as mentioned previously: the number of 3000 inhabitants in a town area was taken as the lowest border in the determination of small towns. Supply and service activities were evaluated according to their presence in the area.

Criteria	**Indicator**	**Average for 17 settlements considered in the analysis**	**Border value chosen**
Formal	1. Number of inhabitants	38.499	≥ 20.000
	2. Migration of inhabitants 2003–2005	–0.5 %	≥ 0 %
Physiognomic-morphologic	3. Number of dwellings per building	3.0	≥ 3
Functional	4. Number of inhabitants per work place	1.8	≤ 1.8
	5. Share of active daily commuters to the town area	58%	≥ 58%
	6. General hospital	10/17	Yes/No (1/0)
	7. Regional agencies and associations	12/17	Yes/No (1/0)
	8. Public cultural infrastructure of regional importance (cinema, museum)	15/17	Yes/No (1/0)
	9. Institutions of higher education	10/17	Yes/No (1/0)
	10. Circuit court	9/17	Yes/No (1/0)
	11. Share of the inhabitants employed in services	57%	≥ 57%
	12. share of inhabitants with higher and university education	15.8%	≥ 15.8%

Table 3: *Criteria, indicators and their border values for definition of medium-size towns in Slovenia (Prosen et al., 2007a).*

The border value of the indicator of population migration was determined by Ravbar (1993) at 0.6% annual growth of inhabitants, however, taking into account the current state of the decline in the number of inhabitants in towns (SURS, 2005) the value seemed to be overoptimistic. Therefore, for growth of inhabitants we used the calculated mean value of the 104 towns, which was 0%. The border value of other indicators was determined as the mean value.

Characteristic of the medium-size towns is that in most cases they are regional and provincial centres. The determination of medium-size towns was performed with a methodological approach similar to that determining small towns, whereby only 12 indicators were used (Table 3). The border values of the indicators were determined similarly to those of small towns, however, the emphasis was on other supply and service activities. Similarly to small towns, the border size of the urban area was determined for medium-size settlements (20,000 inhabitants), relying on the relevant domestic and foreign literature, as mentioned before. Despite this, 17 urban areas with more than 10,000 inhabitants were also included in the analysis. This decision, which was found to be the right one in the course of the study, was made due to the known special features of urban centres in Slovenia and the entire Slovenian urban network. The total number of points was 12 and the calculated average value of the points achieved was 7. Due to similar reasons to those considering small towns, the border of the number of points was adapted to the special circumstances in Slovenian towns. All towns achieving 6 points or more were considered as medium-size towns.

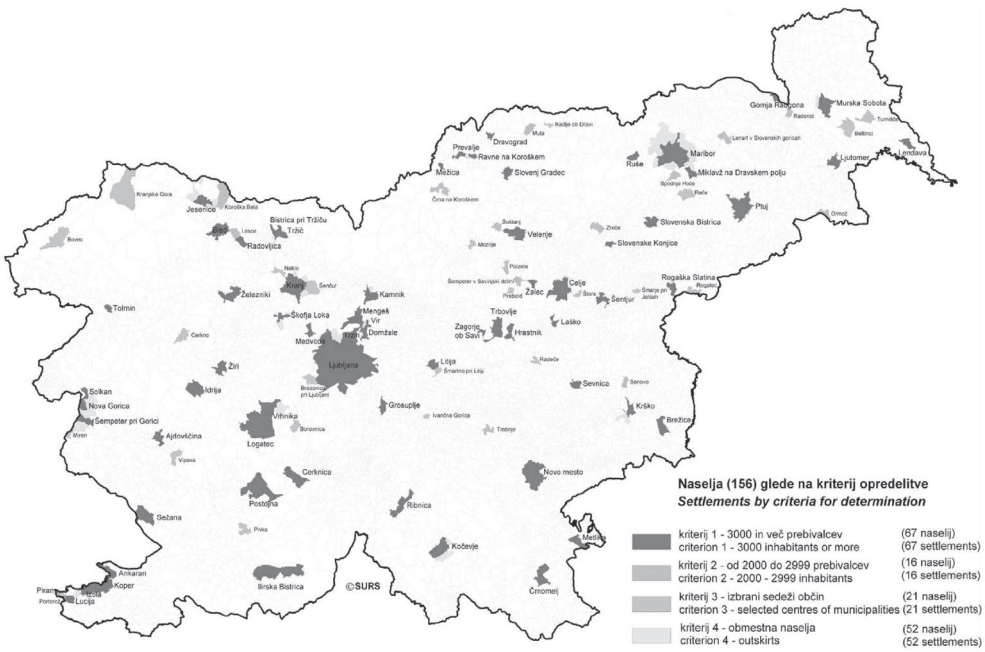


Figure 2: *Urban settlements and settlements within urban areas in the Republic of Slovenia (source: Pavlin et al., 2003).*

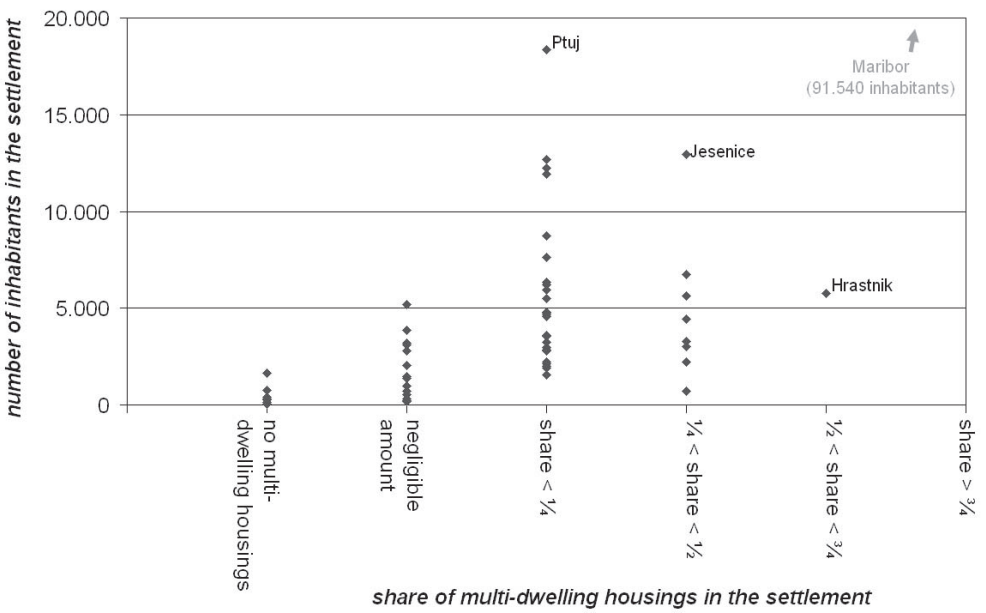
The second part of the study was based on the qualitative analysis of SMESTOs using the descriptions of the urban network as supported by the questionnaire. In this way we revised and thoroughly defined the information gained on the basis of analysis of other written sources and documents (SPRS, 2004; SRS, 2005; ZLS, 2005; SVR, 2006; ZPN, 2007). The questionnaire helped us with the assessment of the state and development needs and possibilities of connections between the settlements, based on practical experience. The questionnaire covered 156 urban settlements and settlements within urban areas (Figure 2), as determined by the Statistical Office of the Republic of Slovenia (Pavlin et al., 2003).

The questionnaire was comprised of several subject areas: basic data on the settlement, the role of the settlement in the urban network, morphology, development, co-operation, connection with other settlements etc. Using the qualitative analysis of the responses, we addressed the role and importance of SMESTOs in the polycentric urban network as well as the current and potential connections into conurbations. The latter may be an important contribution to enhancement of urban centres in some less developed areas of Slovenia. The results of the qualitative analysis were further supported by the results of statistical tests of connections of the variables chosen.

3 SMESTO DEFINITION AND THEIR ROLE IN THE URBAN NETWORK OF SLOVENIA

3.1 Definition of small towns

The number of inhabitants in the towns of Slovenia is decreasing (see also Tables 2 and 3). The decline in urban population is due to the migration into the suburbs and neighbouring settlements. This is especially evident in Ljubljana, Maribor, Celje and other larger towns, while the number of



Graph 1: *Share of multi-dwelling units in relation the number of inhabitants in a settlement.*

inhabitants in small towns, where there is the highest growth in population, is on the rise. Cases of fast growing urban settlements near Ljubljana are: Domžale, Grosuplje, Vir, Vrhnika and Trzin; in the vicinity of Maribor: Ruše, Rače, Slovenska Bistrica, in the vicinity of Nova Gorica: Šempeter pri Gorici, and in the vicinity of Celje: Šempeter v Savinjski dolini. A more detailed morphological analysis of Ljubljana as an urban region shows us that Trzin and Grosuplje are almost continuously connected with the City of Ljubljana. The analysis shows that a large urban agglomeration has become a part of Ljubljana, starting with Kamnik and Domžale in the North-East and ending with Vrhnika in the West.

Based on the indicator of physiognomic/morphologic criteria, the portion of multi-dwelling buildings in the settlement was determined. Graph 1 represents the structure of the towns by the relationship between multi-dwelling units in a settlement and the number of inhabitants.

It has been established that the towns of Hrastnik, Ravne na Koroškem, Jesenice, Velenje and Trbovlje had on average more than four apartments per building. These towns have a work-intensive industry, where the workers live in "traditional" workers' blocks of flats. As a consequence, these towns have a low rate of high education and people employed in services (SURS, 2005). The town of Velenje is a special case, since with its 25,481 inhabitants it fulfils the formal requirements for it to be considered a medium-size town, however it does not reach other important values from the physiognomic/morphological and functional groups of criteria. Out of 20 points, Velenje collected only four, thereby ranking among small towns.

The relationship between the number of inhabitants and the number of work places furthermore showed the role of a settlement in the urban network. A high relationship between the number of inhabitants and the number of work places, such as the one in the towns of Borovnica, Šenčur, Miklavž na Dravskem polju, Črna na Koroškem and Brezovica pri Ljubljani, is confirmed by the share of inhabitants using the settlements for their habitation only (dormitory towns). Three towns having the lowest ratio were from the Pomurje statistical region (Murska Sobota, Ljutomer and Lendava). This shows the current development poles in the statistically weakest Slovenian region. Urban settlements with redundancy of work places are Trzin, Lenart v Slovenskih Goricah, Naklo, Zreče and Ormož. It needs to be emphasized that these conclusions are not based solely on the redundancy of work places, since these data itself do not necessarily mean that a settlement is a development pole rather than a dormitory town.

The share of persons in employment who commute daily also indicates the amenity value of a town, as recognized by its surroundings, and its close connection to the redundancy of work places in a town. Urban settlements of Trzin and Naklo have an above average percentage of daily commuters. Trzin, especially, has established itself with a large and successful industrial and trade zone, which offers a surplus in work places and an attractive place to settle down. It is however necessary to have in mind that in small towns the relationship of work places can change quickly, since the gain or loss of several hundred places can have a much greater influence over small towns than over larger ones, such as Ljubljana.

The group of functional criteria includes five indicators (health care centre, pharmacy, primary school, bank and administration establishments) that should be possessed by each small town.

Health care centres are missing only in the urban settlements of Trzin and Lesce. All small towns have at least one primary school. Out of all 93 small towns in Slovenia, 38 have a gymnasium or another kind of vocational or technical secondary school.

The border value (54%) of the ratio of persons employed in services out of all persons in employment, living in the urban area, exceeds 45 of the total of 93 small towns in Slovenia. Small Littoral and Gorenjska region towns are ahead due to tourism. The border values are not achieved by the more industrial towns (Velenje, Hrastnik, Trbovlje and Jesenice).

At last, we analysed the ratio of population with higher and university education. The high ratio is achieved in the towns located close to one of the four universities or one of the higher education centres.

After the analysis and allocation of points to each indicator, a methodological issue emerged: the mean value (8.6 points), which was calculated by using the 104 investigated urban settlements in Slovenia, could not be used as the lower border value of points for the determination of small towns. If the border of 8.6 points remained, only 59 urban settlements could be identified as small towns. The town of Trbovlje and some other towns with population of 10,000 and over and having an extremely important historical role in the urban network of Slovenia, would remain outside the category of small towns. The border value for small towns was thus set at seven points. In this way the settlements were included, which did not fulfil all the criteria evenly, but which, due to different (historical) reasons, were classified as small towns. Such is the town of Zagorje ob Savi, which has more than 5000 inhabitants and is to be classified as a small town due to the high number of inhabitants. It fulfils all the functional criteria related to supply and service activities, but fails to meet other criteria, attributed to the economic and demographic problems of the region.

A special attention was given to urban areas that reached the required number of points, but had less than 2000 inhabitants. These included the towns of Cerkno, Ivančna Gorica, Kranjska Gora, Miren, Mozirje, Naklo, Pivka, Prebold, Šempeter v Savinjski dolini, Šmarje pri Jelšah, Šmartno pri Litiji and Vipava. 2/3 of the urban areas had more than 1500 inhabitants, and 1/3 more than 1400 inhabitants, respectively (Kranjska gora, Miren, Šmarje pri Jelšah and Šmartno pri Litiji). Kranjska Gora is an important tourist town with much potential for development, reflected in the 11 points achieved. The other three centres, however, are important local centres, especially Šmarje pri Jelšah, which also acquired 11 points.

Among the urban settlements the town of Vipava reached 12 points, Ivančna Gorica 11 points, Šmarje pri Jelšah 9, and the rest urban settlements 9, 8 and 7 points, respectively. All the towns represented strong local centres and had potentials for development large enough to argue for their classification among small towns.

Table 4 shows that out of 104 of urban areas considered, there were 93 that met the criteria for (at least) small towns. These include the towns that met the basic formal conditions for medium-size or large towns and are discussed in continuation.

No.	Urban area	No. of points	No.	Urban area	No. of points
1	Ajdovščina (M)	11	48	Ormož (M)	10
2	Ankaran (M)	8	49	Piran/Piran (M)	8
3	Bled (M)	10	50	Pivka (M)	9
4	Borovnica (M)	8	51	Polzela (M)	7
5	Brežice (M)	9	52	Portorož/Portorose (M)	9
6	Celje (M)	11	53	Postojna (M)	11
7	Cerknica (M)	9	54	Prebold (M)	9
8	Cerkno (M)	8	55	Prevalje (M)	8
9	Črna na Koroškem (M)	7	56	Ptuj (M)	10
10	Črnomelj (M)	7	57	Rače (M)	7
11	Domžale (M)	13	58	Radeče (M)	7
12	Dravograd (M)	7	59	Radenci (M)	10
13	Gornja Radgona (M)	9	60	Radlje ob Dravi (M)	7
14	Grosuplje (M)	11	61	Radovljica (M)	9
15	Hrastnik (M)	8	62	Ravne na Koroškem (M)	9
16	Idrija (M)	10	63	Ribnica (M)	9
17	Ilirska Bistrica (M)	8	64	Rogaška Slatina (M)	10
18	Ivančna Gorica (M)	11	65	Ruše (M)	8
19	Izola/Isola (M)	9	66	Sevnica (M)	7
20	Jesenice (M)	9	67	Sežana (M)	12
21	Kamnik (M)	13	68	Slovenj Gradec (M)	11
22	Kočevje (M)	8	69	Slovenska Bistrica (M)	10
23	Koper (M)	11	70	Slovenske Konjice (M)	11
24	Kranj (M)	9	71	Solkan (M)	7
25	Kranjska Gora (M)	11	72	Spodnje Hoče (M)	11
26	Krško (M)	8	73	Šempeter pri Gorici (M)	10
27	Laško (M)	11	74	Šempeter v Savinj. dol. (M)	7
28	Lenart v Slov. Goricah (M)	11	75	Šenčur (M)	7
29	Lendava/Lendva (M)	11	76	Šentjur (M)	9
30	Lesce (M)	8	77	Škofja Loka (M)	11
31	Litija (M)	8	78	Šmarje pri Jelšah (M)	11
32	Ljubljana (M)	11	79	Šmartno pri Litiji (M)	7
33	Ljutomer (M)	10	80	Šoštanj (M)	9
34	Logatec (M)	8	81	Tolmin (M)	8
35	Lucija/Lucia (M)	9	82	Trbovlje (M)	8
36	Maribor (M)	11	83	Trebnje (M)	10
37	Medvode (M)	11	84	Trzin (M)	8
38	Mengeš (M)	9	85	Tržič (M)	8
39	Metlika (M)	7	86	Velenje (M)	8
40	Mežica (M)	7	87	Vipava (M)	12
41	Miklavž na Drav. polju (M)	7	88	Vrhnika (M)	11
42	Miren (M)	7	89	Zagorje ob Savi (M)	7
43	Mozirje (M)	8	90	Zreče (M)	10
44	Murska Sobota (M)	10	91	Žalec (M)	9
45	Naklo (M)	8	92	Železniki (M)	7
46	Nova Gorica (M)	11	93	Žiri (M)	7
47	Novo mesto (M)	11			

Table 4: *List of urban areas meeting the criteria for small towns and the number of points achieved (Prosen et al., 2007a).*

Figure 3: *Small towns in Slovenia (Prosen et al., 2007a).*

3.2 Definition of medium-size towns

The analysis of the number of inhabitants of medium-size towns did not yield any new findings, therewith only confirming that in Slovenia there is a large number of small towns and other kinds of settlements, and less medium-size towns with approximately 40,000 inhabitants. The border value of the indicator of the number of inhabitants for medium-size towns was set at 20,000 inhabitants. This however was not met by the towns of Izola, Murska Sobota and Nova Gorica. The number of inhabitants is on the increase only in Izola, and decreasing in the other two towns mentioned, confirming the trend of migration from towns to suburbs. The largest density of apartments per building is in the towns of Nova Gorica and Celje, and the lowest in Murska Sobota with the prevalence of single one- or two-family homes. The most favourable relationship between the number of work places and the number of inhabitants was recorded for the town of Murska Sobota, which had the same number of work places and inhabitants. Nova Gorica and Novo mesto also stand out.

In relation to supply and service activities, we tested the towns for three activities of regional importance (general hospital, regional agencies and associations, and public cultural infrastructure of regional importance), and two activities of national importance (institutions of higher education and circuit court). There is no general hospital in the town of Koper, while all other towns (Celje, Izola, Maribor, Murska Sobota, Novo mesto and Nova Gorica) have all the activities of regional importance. Looking at the activities of national importance, there is no circuit court in Izola, however there is one in the near-by Koper. The proportion of service activities in all towns is

No.	Urban area	No. of points
1	Celje	11
2	Izola/Isola	7
3	Jesenice	6
4	Koper/Capodistria	9
5	Kranj	8
6	Ljubljana	10
7	Maribor	9
8	Murska Sobota	9
9	Nova Gorica	10
10	Novo mesto	9
11	Ptuj	8

Table 5: *List of urban areas meeting the criteria for medium-size towns and the number of points achieved (Prosen et al., 2007a).*

above 60%, except in Novo mesto (57%). the share of persons with higher education in Izola is too low to reach the suggested criterion for a medium-size town, and the town with the highest proportion of inhabitants with higher or university education is highest in Nova Gorica.

There are 10 medium-size towns in Slovenia (Celje, Izola, Koper, Maribor, Murska Sobota, Novo mesto, Nova Gorica, Kranj and Ptuj) that reached, following all the criteria, six points or more,

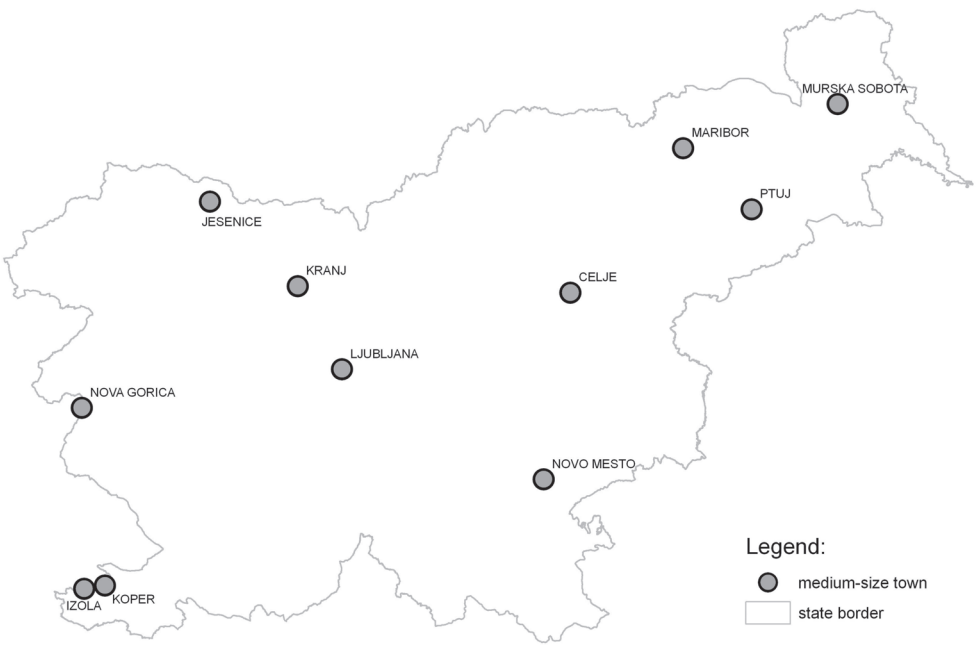


Figure 4: *Medium-size towns in Slovenia (Prosen et al., 2007a).*

and the city of Ljubljana, which is classified as a large town (ESPON 1.1.1, 2004). Jesenice achieved the border value of six points and was classified as a medium-size town.

The urban areas of Celje, Koper, Ljubljana, Maribor, Nova Gorica and Novo mesto are in their size and role in the country and region rightly classified as medium-size towns. Among medium-size towns, the towns of Murska Sobota and Izola stand out in having not much above 10,000 inhabitants. Looking closely, we can see that the area of Murska Sobota is the regional centre of the entire Pomurje, thereby justifying the status of a medium-size town. Contrary to Murska Sobota, where there are no large towns in its vicinity, Izola is situated near Koper and it is empowered by its economy while, on the other side, it develops its own tourism. Izola also boasts a general hospital covering all coastal towns, which was, next to favourable conditions for economic development and tourism, the key factor for reaching the seven points required.

3.3 The role of SMESTOs in the polycentric urban network of Slovenia

The results of the analysis of SMESTOs have shown that in Slovenia there are 10 medium-size towns that are centres of national importance in regional areas, and the city of Ljubljana, which is the only large town in the Slovenian urban network and the only centre of international importance. Maribor and Koper are also towns of international importance. From the spatial point of view (SPRS (2004)) the territory of Slovenia is evenly covered by centres of national importance (with the exception of the Kočevsko region).

It has been shown that some small towns have been identified as regional centres of national importance in SPRS (2004). Characteristic of these towns is that all the activities necessary for a regional centre are not yet developed, or alternatively, the towns have economic and/or structural problems disabling their development. The reason may also be the proximity of large towns, which would typically have a negative influence to their development. Other small towns are centres of regional importance or they represent intermunicipal centres of local importance.

Similar conclusions were reached within the Interreg IIIb RePUS project (2007), where the areas of local and regional employment systems were determined. The results of the RePUS project in the less centred areas almost coincide with the actual division of Slovenia at the level of administrative units or SKTE4 (Standard Classification of Territorial Units) as well as with the design of the polycentric urban system in SPRS (2004). The results of the RePUS project, on the other hand, stand out primarily in the much greater gravitational pull of the city of Ljubljana. The local employment system of Ljubljana in SPRS (2004) includes the centres of Logatec, Vrhnika, Domžale, Kamnik, Litija, Zagorje ob Savi, Grosuplje and Trebnje, and small towns of Medvode, Trzin, Mengeš and Ivančna Gorica.

For transparency reasons, in the continuation SMESTOs and their role in the urban network in the statistical regions of Slovenia are discussed.

In the Gorenjska statistical region the town of Jesenice is one of the most important urban centres. This is an old industrial town, which has had, according to Pogačnik (1996), the most trouble with its image and orientation among all Slovenian towns. The town is squeezed in

between the Karavanke mountain range and the Mežakla plateau; furthermore, it is aesthetically challenged due to the ironworks, railway, open warehouses, tailings and similar encroachments upon space. Spatial restrictiveness and the prevalent industrial orientation do not allow the town to develop the roles of a potential regional centre of national importance. In SPRS (2004) Jesenice is, together with Radovljica, defined as a centre of national importance within regional areas, which will in the future spread its influence transnationally.

Kranj is also considered as a national centre within the regional area of Gorenjska. It started to develop after World War II as an industrial centre with an abundance of apartment block neighbourhoods and single-family units (Pogačnik, 1996). The vicinity of the capital city gives the town certain advantages; however, despite its size it cannot develop all the activities necessary for a centre of regional importance. In the sense of polycentric development, the vicinity of Ljubljana has a negative impact to its development, evident in the failure of the town to unfold its identity in the region. The town of Kranj and the conurbation Jesenice–Radovljica are centres of regional importance, however, they have not reached their full potential yet.

In the Goriško statistical region, the town of Nova Gorica is the national centre within the regional area. Economically and culturally, it has a high significance in the region and together with other regionally important centres of Ajdovščina, Idrija, Tolmin and partly Sežana it is part of an important polycentric network of centres in North Primorska region.

The conurbation Koper–Izola–Piran belongs to the fast developing conurbations in Slovenia. The proximity enables the towns to cover all the areas and activities necessary for a nationally important centre within a regional area. The town of Koper is an important national freight hub and sea port, and the towns of Izola and Piran develop as important tourist towns taking the advantage of the vicinity of Koper.

The lack of a centre of regional importance is evident in the Notranjsko-kraška statistical region, where Postojna, as the potential centre of national importance, has not seen all the important acitvities developed. Consequently, it has been classified as a small town. The region also lacks further strong centres of regional importance, such as Ilirska Bistrica and Cerknica.

The Central Slovenia statistical region is the strongest Slovenian region, developing around the internationally important capital city of Ljubljana. As a centre of regional importance, there is also the conurbation of Domžale–Kamnik, while Grosuplje, Vrhnika and Trzin are centres of local importance. In the region, it is difficult to talk about polycentric urban development, but rather of a large urban agglomeration having Ljubljana as its centre. The analysis shows that based on the criteria mentioned the towns in the region rank among the most developed towns in Slovenia.

In SPRS the conurbation Trbovlje–Hrastnik–Zagorje ob Savi is defined as a nationally important centre of the regional area. These are industrial and mining towns with many structural problems; however, there is the advantage of being relatively close to Ljubljana that offers an abundance of employment possibilities. Trbovlje is the largest in size, and together with Hrastnik and Zagorje ob Savi, it has been classified as a small town. The region lacks a medium-size town that would not be based on secondary activities, but rather on tertiary and quaternary ones.

In the statistical regions of Dolenjska and Lower Sava River the town of Novo mesto and the conurbation of Brežice–Krško–Sevnica are planned as the centres of national importance. Novo mesto governs over the entire Eastern part of Slovenia, between the Kočevsko and Štajerska regions, and was classified a medium-size town. Other towns (Brežice, Krško and Sevnica) are small towns according to the criteria. Together they perform all the activities of medium-size towns, therefore they can be dealt with according to their common functioning as a centre of national importance, and, separately, as centres of regional importance. Small towns, such as Črnomelj, Ribnica and Kočevje, are towns of regional importance. Kočevje stands out the most in having a large number of inhabitants and at the same time lacking several activities (e.g. general hospital) in order to become a regional centre of national importance.

In the Savinja statistical region the town of Celje is the centre of national importance, which has been classified as a medium-size town with the most points achieved in Slovenia. Velenje, which is in the Strategy classified as a regional centre, did not meet the criteria for a medium-size town, despite the number of its inhabitants. The problem of Velenje is that many activities of the tertiary sector, and even more of the quaternary sector, are performed by the neighbouring town of Celje. After SPRS (2004) there is another conurbation of regional importance: Šmarje pri Jelšah–Rogaška Slatina, and towns representing intermunicipal centres (Laško, Mozirje, Slovenske Konjice, Šentjur and Žalec).

The Koroška statistical region lacks a medium-size town that would represent a centre of national importance. In SPRS (2004) the conurbation Slovenj Gradec–Ravne na Koroškem–Dravograd

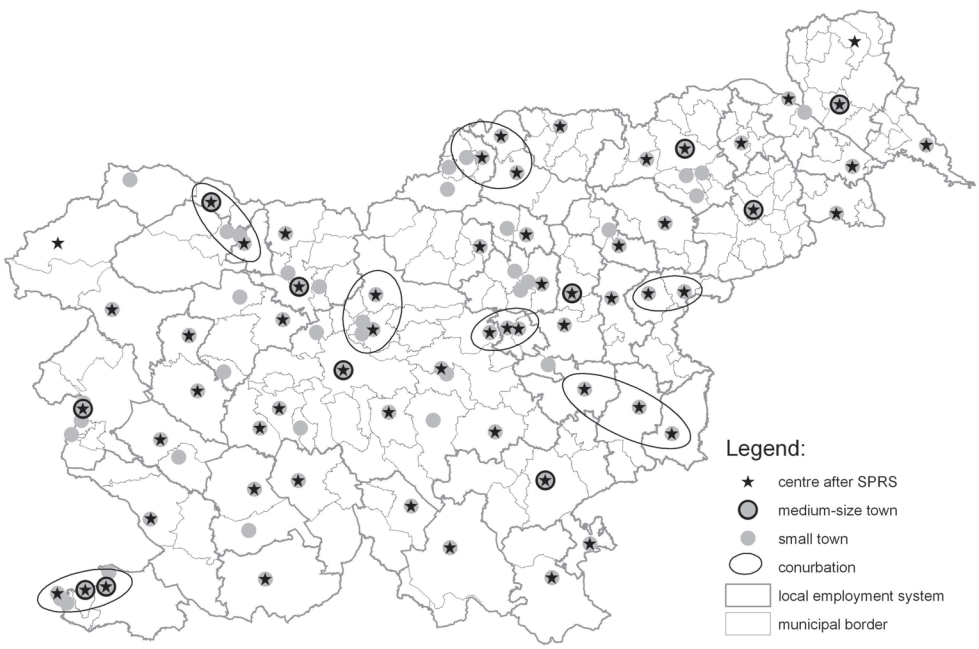


Figure 5: *Synthesis and comparison of results with the definition of urban centres in SPRS (2004) and local employment systems (RePUS, 2007).*

is defined as the centre of national importance, where all three urban areas have a total of 19,204 inhabitants. Each one separately is considered a small town, since none has a population exceeding 10,000. Slovenj Gradec is the town fulfilling the highest number of criteria (general hospital, circuit court).

The town of Maribor is a medium-size town of international importance. In the Podravje statistical region, there is also the town of Ptuj, which is after SPRS (2004) a centre of national importance; there are also several intermunicipal centres, such as Lenart v Slovenskih Goricah, Slovenska Bistrica, Ruše and partly Ormož. Ptuj is among small towns even though its population is nearing 20,000. Despite the vicinity of Maribor performing many activities, Ptuj is a fast developing town with the potential to become an important regional centre.

The last to discuss is the Pomurje statistical region, which is according to all (statistical) indicators the weakest in the country. There is a strong regional centre of national importance, Murska Sobota, which has just over 12,000 inhabitants. The town has many work places and performs important activities, and it comes as no surprise that it has been classified as a medium-size town (regardless the low number of inhabitants). There are three further centres of regional importance evenly distributed around Murska Sobota: Ljutomer, Gornja Radgona and Lendava. Goričko performs fewer activities, having only one weak intermunicipal centre – Gornji Petrovci, which is not even considered as an urban settlement. A centre of regional importance is therefore needed.

3.4 Conclusions of the macro investigation

The results of the investigation have pointed to a large diversity of urban areas. Generally, in the urban network of Slovenia there is a prevalence of small settlements, which are not even defined by SPRS (2004), since they represent centres of local importance. Next to the large number of small towns, there are several medium-size towns in Slovenia. These towns represent the framework of a polycentric urban network and their development is of utmost importance for further development of the country following the principles of sustainable spatial development and coherent regional development. The settlements are too often too weak to ensure the development of an area by themselves. This is further supported by the results of the analysis of the role and position of the settlement in the urban network considering the definition of the role of the settlement in the design of the polycentric urban network of Slovenia (2004). Table 6 shows the location of the settlements in the settlement system and the definition of a settlement in SPRS (2004). Having in mind the results of the contingency test we can testify with a confidence level higher than 99% that the location of a settlement in the settlement system and the definition of a settlement in SPRS are statistically connected random variables ($\chi^2 = 9{,}21;\ \alpha = 1\ \%$)..

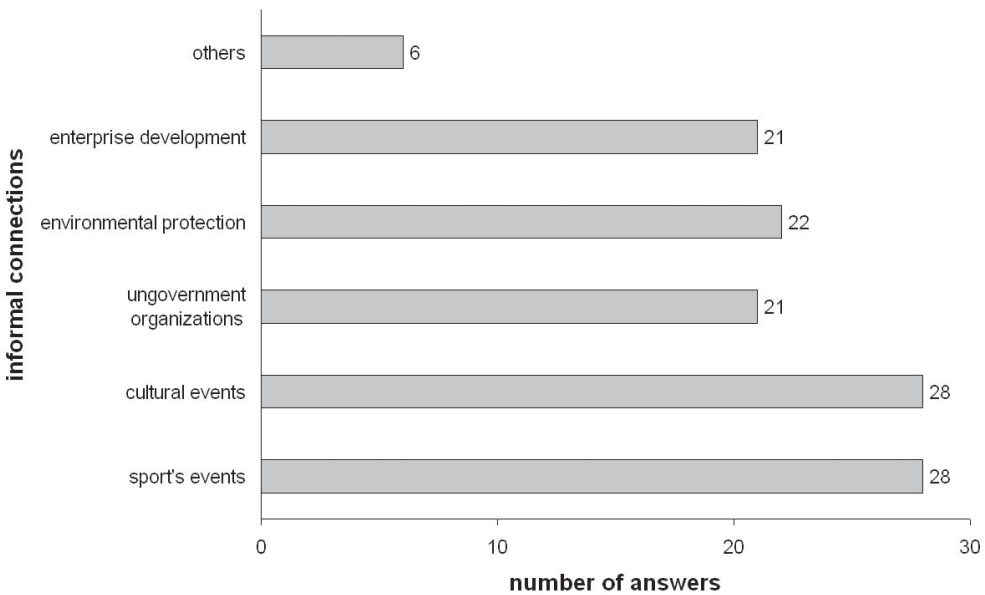
Some urban areas are linked into urban agglomerations at the national, regional and intermunicipal levels, which is significant in ensuring further development of the polycentric urban network. In such cases it was shown that the settlements connect into wider urban areas with other, neighbouring settlements, however, these connections are often informal (graph 2). These connections most often involve sport and cultural events, followed by environmental protection activities, co-operation in entrepreneurship and non-governmental organizations, and also traffic

	centre of urban agglomeration or SMESTO at the edge of agglomeration	SMESTO network	SMESTO in rural areas	total
centre defined in SPRS	6	10	8	***24***
centre not defined in SPRS	18	16	1	***35***
total	***24***	***26***	***9***	***59***

Table 6: *Contingency table of the position of a settlement in the settlement system and definition of the settlement in SPRS (MOP 2004)* ($\chi^2 = 9{,}21$; $\alpha = 1\ \%$).

and fire brigade related activities (stated under Other in the questionnaire).

There is official co-operation in joint implementation projects, common development strategies and participation in different tenders for studies and projects in tourism (stated under Other in the questionnaire). For a more efficient development of the entire urban network, the formal co-operation and division of functions should be encouraged by the state, which would enhance the significance of each centre separately and enable a more coherent national spatial development. The results of the contingency test show (Table 7) that the mutual co-operation of settlements, as



Graph 2: *Informal connections with other settlements (Prosen et al., 2007b).*

regards development plans, strategies, development programs and similar, is closely linked to the definition of the role of the settlement in SPRS ($\chi^2 = 7{,}19$; $\alpha = 1\ \%$), while this cannot be said for other forms of in/formal co-operation (administrative functions, entrepreneurship, public transport, schools, culture, sport) (20% for all cases).

	national centre of international importance, centre of national or regional importance	**centre of intermunicipal importance or centre defined in SPRS**	***total***
connection based on common development strategies, programs and similar	15	22	***37***
no connection based on common development strategies, programs and similar	1	17	***18***
total	***16***	***39***	***55***

Table 7: *Contingency table of the position of a settlement in the settlement system (SPRS; 2004) and connections related to common development strategies, development programs and similar* ($\chi^2 = 7{,}19$; $\alpha = 1\ \%$).

Next to the economic and socio-demographic indicators, the morphological indicators have proven highly useful in defining small and medium-size towns as carriers of the urban network. This group of indicators enables us to perform a thorough analysis of urban settlements and define them based on physical (spatial) structures. Within the set of physiognomic/morphologic criteria we investigated the mutual statistic connectivity of some physical elements of space (share of housing units, green and leisure areas) with the potentials for urban development. It became evident that only some indicators were in mutual statistical connectivity, while for the most of them this could not be said. Their further study will therefore significantly contribute to the investigation of the inner design of urban settlements (definition of the urban core, inner and external ring) and to distinguishing between towns and other areas.

Furthermore, the contingency test helped us to study the implications of size of the settlement (the number of inhabitants in a settlement) to the potential development of the settlement within the next ten years. In relation to this we can make a distinction between the following four classes:

- up to 1000 inhabitants,
- between 1001 and 3000 inhabitants,
- between 3001 and 10000 inhabitants, and
- 10,001 inhabitants and more.

The data on the potential development of settlements in the next 10 years were based on the questionnaire related to the significance of small and medium-size settlements of urban development (Prosen et al., 2007b). We analysed the potential development in the fields of economic activities, employment, housing, tourism and education (including the introduction of new schools), improvement of administrative activities, environmental protection, sports infrastructure and activities, traffic and municipal network and cultural activities. Each of these development fields was tested for its connectivity with the size of the settlement. A summary of the results is given in Table 8.

Development in a settlement	**Connectivity between the size and development of a settlement**
(a) economic activities	Yes ($\chi^2 = 13.32;\ \alpha = 1\%$)
(b) work places	Yes ($\chi^2 = 10.67;\ \alpha = 1\%$)
(c) housing	Yes ($\chi^2 = 10.60;\ \alpha = 1\%$)
(d) tourism	No
(e) education (including the introduction of new schools)	Yes ($\chi^2 = 25.34;\ \alpha = 1\%$)
(f) improvement of administrative activities	Yes ($\chi^2 = 18.95;\ \alpha = 1\%$)
(g) environmental protection	No
(h) sports infrastructure and activities	Yes ($\chi^2 = 6.03;\ \alpha = 5\%$)
(i) traffic and municipal network	Yes ($\chi^2 = 4.70;\ \alpha = 10\%$)
(j) culture	Yes ($\chi^2 = 9.87;\ \alpha = 1\%$)

Table 8: *Connection between the size and potential development of the settlement (Yes – the statistical connectivity between the variables exists; No – there is no statistically significant connectivity between the variables).*

A more detailed analysis of the statistical connectivity between the size of the settlement and fields for potential development of a settlement has shown that there is (in cases a, b, c, e, f, h, i and j of Table 8) in fact a positive linear connection (the increase in population also causes the increase in the potential for development).

Last but not least, we discuss the connectivity of urban settlements with other urban centres at the levels of intermunicipal, regional, national and international co-operation (see Table 9).

The results have shown that the size of the urban settlement does not have a major role in the connection of urban settlements with other urban centres, even though the respondents gave this very reason for a poorer or better connectivity with other urban settlements and settlements

Strengths		Weaknesses	
Possibility of participation in international tenders and calls	51 (85%)	Long negotiations	38 (63%)
Cheaper and more efficient carrying out of project	44 (73%)	»Exclusion« from the decision-making	23 (38%)
Higher competition and/or recognition at a broader scale	37 (62%)	Harder inclusion of inhabitants (public participation and co-operation, financial support ...)	17 (28%)
Other	6 (10%)	Other	2 (3%)

Table 9: *Strengths and weaknesses of co-operation with other settlements (Prosen et al., 2007b).*

within urban areas. Similar results were obtained by the analysis of responses regarding the inclusion into international projects and acquisition of grants from different national and international tenders and calls. Mostly, the co-operation and inclusion into international projects was considered a more important strategy of urban development, as well as the commitment of administration in achieving the goals set, than the size of the urban settlement.

In the Slovenian urban network, of high importance to urban settlements is transnational and other international co-operation. On the one hand, the problem-solving and inclusion into the international community is made easier, and on the other hand, this enhances their role in the domestic urban network. This, however, is greatly supported by the well developed infrastructure.

4 CONCLUSIONS

In Slovenia, the division into small, medium-size and large towns has been defined only vaguely. The Government of the Republic of Slovenia has defined only the status of towns, which is not enough for to make a further division. Therefore, to determine the roles of SMESTOs in the urban network of Slovenia, one first had to provide the proper definitions of SMESTOs. Based on domestic and foreign literature we tried to find the most appropriate criteria, which helped us to specify 93 small towns, including 10 medium-size towns and Ljubljana as the only large town.

We have seen that there is a lack of medium-size towns with more than 30,000 inhabitants, which would function as major regional carriers of development. Slovenia has only 10 medium-size towns and/or conurbations: Celje, Izola–Koper, Maribor, Murska Sobota, Novo mesto and Nova Gorica, Jesenice, Kranj and Ptuj. Next to the nine potential regional centres (Koper and Izola that are each considered as medium-size towns have grown into each other and became linked into a common conurbation), the Koroška and Kočevsko regions are lacking strong centres of regional importance.

Due to their speedy development and attraction, the role of small towns is hard to determine. In most cases these towns are the local centres of one or several municipalities. On the other hand, there are small towns with more than 10,000 inhabitants gaining in regional importance. These small towns, which are large in population, have been characterized by too small centrality and

narrow specialisation of economy in the past. Despite the strong restructuring processes, they failed to develop a sufficient centrality and diversity inherent in regionally important centres.

We think that the problems of Slovenian towns are not to be sought for within the towns only, but also is the poor regional/provincial design policy in Slovenia. The towns can develop their centrality only if their role in space is defined clearly. In Slovenia, the City of Ljubljana has received too much centrality (Zavodnik Lamovšek, 2007), while other towns have seen too little of it. Also, SMESTOs have been subjected to constant change in terms of globalisation, growth of the tertiary sector and other structural changes. SMESTOs need to see a diverse specialisation of local economy, which enhances social development, improves living conditions, and supports all the elements of sustainable development. This, in our opinion, is the key to the success of small and medium-size towns in Slovenia.

All the findings support the need for a planned orientation of urban development at the national level, which would also entail the adoption of a proper urban development policy.

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