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A TYPOLOGY OF RURAL AREAS IN SERBIA

ABSTRACT: *The goal of this paper is to present a method to establish the typology of rural areas in Serbia . Initially the OECD rurality criterion was applied to define the rural areas in Serbia. Subsequently, relevant indicators were selected (demographic, geographic, economic, employment-related, human capital, agricultural, tourism and infrastructure) and used to define and distinguish relatively homogeneous rural regions, based on correlation analysis,* *factor analysis (VARIMAX method) and cluster analysis. Cluster analysis revealed six regions of different sizes and characteristics. Practical considerations reduced this to four types, resulting in a robust scheme which accurately reflects the heterogeneous nature of rural Serbia.*

KEY WORDS: *rurality, typology, rural regions, Serbia*

JEL CLASSIFICATION: O18, Q18, R12, R58

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1. Introduction

With time the concept of rurality has been made more extensive and profound. Originally, a rural region was viewed as a residual area of an urban centre (very often rural areas are simply defined as those areas that are not urban – "non-urban areas"). The term "rurality" relates to a specific set of characteristics, which could not be used as criteria in defining rural areas. Although "rurality" is related to specific characteristics such as lower population density, small population size of settlements (villages and small towns), countryside life, presence of agriculture and forestry, mono-residences, smaller size of enterprises and lower scale of economic activities, these characteristics are not used as criteria in defining rural areas. The most often used criteria are population density and population size of settlements. However, it is also possible to use other criteria to define rural areas, such as those relating to the territorial and/or sectoral characteristics. Nowadays, predominant opinion is that a rural region represents a territorial unit with one or more small/middle-sized towns surrounded by a large area of open space, with a relatively low population density and regional economic structure, which reflects the situation of a certain labour market (Bogdanov and Stojanovic, 2006).

The widespread adoption of area or regional based approaches to rural development has resulted in a greater demand from policy formulators and administrative bodies for increasingly refined definitions of rurality (Commins and Keane, 1994, Green, 2005). This demand stems from widespread recognition of the limitations of sectoral approaches to rural development (CEC, 1988, Fluharty, 2008). The area based approach to rural development depends on the heterogeneous characteristics of rural areas and their potential, the complex connections between town and countryside, the need for a more efficient policy for these areas through decentralised decision-making, and management of the development process and other factors. This approach has been incorporated in the European Rural Development Policy since the 1980's, following the shift from exogenous to endogenous development concepts. Bryden (2002) reported that such policies were directed towards creating economic and social cohesion, achieved by assigning responsibilities to regional and local communities, through partnerships and an integrated approach to territorial development.

Public institutions responsible for rural development, particularly those in developed economies, have come to recognise the significance of rural heterogeneity in determining the outcome to policy interventions. Diversity in rural areas arises from differences in the geographic distribution of natural and human capital and the relative location of rural enterprises vis-à-vis local, regional,

national and international markets (Wiggins and Proctor, 2001). Increasingly, policy formulators are interested in understanding the spatial distribution of such differences within and between rural areas (CEC, 2005). Recent examples of the creation and implementation of rural development policy follow four logical phases (Bogdanov and Stojanovic, 2006):

- Defining rural areas, i.e. definition of rurality,
- Defining types of rural areas with relatively homogeneous characteristics,
- Creating specific development policies for each area,
- Establishing indicators for the evaluation of the effects of rural policies.

The EU has recently developed two sets of baseline indicators: the Context Related Baseline Indicators and the Objective Related Baseline Indicators (DG-Agri, 2006a). These are founded on a comprehensive understanding of the international research in this area and seek to capture the structure and functioning of rural areas through the monitoring and evaluation of key social, economic and demographic data. The baselines incorporate data pertaining to nine broad dimensions including demography, geographical characteristics, economic structures, employment patterns, human capital, agriculture, tourism and infrastructure. These data do not in themselves constitute a typology, but stem from the need to develop more effective and efficient programmes and measures through evidence based planning. Development of the baseline indicators assists in this as it facilitates comparative assessment of the challenges confronting sustainable rural development at sub-national levels.

2. The Methodological Scheme to Define Rural Typology

In response to growing interest in the issue of regional differences, geo-statistical techniques of identifying, classifying and grouping different types of rural areas are increasingly incorporated into rural development policy design processes (Coombes, 1996, DoELG, 2002). Frequently these analyses focus, for the purpose of facilitating policy development, on generating a classification or typology of rural areas based on assessment of demographic, economic and other factors. A review of relevant spatial analysis literature places questions of regional differences and the development of rural typologies in the realm of *local analysis* (Fotheringham, et al., 2000). Local analysis studies can be divided into univariate (the evaluation of a single variable describing a particular location or area) and multivariate (the analysis of several measurements describing the distribution of a particular feature). Which approach is selected depends on the availability of

spatial data and the question being asked. In the development of spatial typologies to characterise rural areas, multivariate analysis is most commonly used, given the need to consider several social, economic and demographic dimensions simultaneously. Other approaches involving univariate analysis were also applied in the past due mostly to the general absence of large scale spatial datasets (CEC, 1988). Regardless of which approach is adopted, their fundamental utility lies in providing both a descriptive assessment of rural areas and a baseline from which the impact of policy impacts can be measured (McHugh, 2001).

Whilst the introduction of baseline indicators, such as those published by the EU, is valuable in undertaking comparisons of small sets of variables, they are limited in terms of developing a fuller understanding of the characteristics of different types of rural area. This constraint is amplified when seeking to compare a large number of variables and/or regions. For this reason a combination of data techniques, primarily data reduction through Principle Component Analysis (PCA) and data grouping through Cluster Analysis (CA), has been applied to identify groups of rural areas that share similar core characteristics. These techniques have been applied in a number of different fields, ranging from water quality monitoring on large rivers (Singh, et al., 2004) to studies of paleoclimates (Phillip, 2008). Most pertinent to this study is research undertaken by Malinen (1995), McHugh (2001) and Gulumser et al., (2007), where PCA and CA were combined to characterise and classify groups of rural areas. A recent study of rurality in Turkey provides a detailed structure and methodological framework identifying and classifying rural areas (Gulumser, et al., 2007). A threefold methodology, based on identifying rural areas using internationally recognised criteria, statistical analysis of social, economic and demographic indicators, and finally principle component analysis to identify key characteristics of rural municipalities, was used, based on techniques applied by Malinen to rural areas in Finland (Malinen, 1995) and McHugh to rural areas in the Republic of Ireland (McHugh, 2001). These publications were crucial in the choice of the methodology and the techniques of data collation and analysis used in this research. This four stage process comprised the identification of rural areas in Serbia, the collation and preliminary statistical analysis of indicators for rural characteristics, PCA, and finally CA and spatial analysis:

- Identifying rural areas in Serbia - A review of indicators used in Serbia and in the European Union for establishing rurality. Selection the most meaningful and appropriate criteria for the Serbian countryside.
- Serbia's Rural Mosaic - A review indicators/variables used for classifying rural areas at European level and selection the most appropriate for the

typology of rural areas in Serbia, taking into consideration data availability and administrative structures.

- Classifying Rural Municipalities in Serbia - Statistical analysis (PCA and CA) to identify homogeneous clusters of rural areas.
- Grouping Rural Municipalities in Serbia – Adaptation of the initial results, in accordance with international practice and experience, taking into consideration the influence of "immeasurable" factors on results obtained by cluster analysis.

3. Rural Areas in Serbia and their Typology – Research Results

3.1. Identifying Rural Areas in Serbia

In Serbia there is no official statistical definition of rural regions. The classification of settlements as urban, rural or mixed was used in the censuses conducted in 1953, 1961 and 1971, when the size of the settlement and the ratio of agricultural compared to the total population were used as criteria. Unfortunately, this approach was abandoned. In the 1981, 1991 and 2002 censuses, settlements were just classified as urban or other. In these years settlements were defined as urban according to the decision of the relevant local authorities. Settlements not declared urban were considered rural (Map 1).

Map 1. Territory of Serbia according to the definition of rurality by Statistical Office of the Republic of Serbia
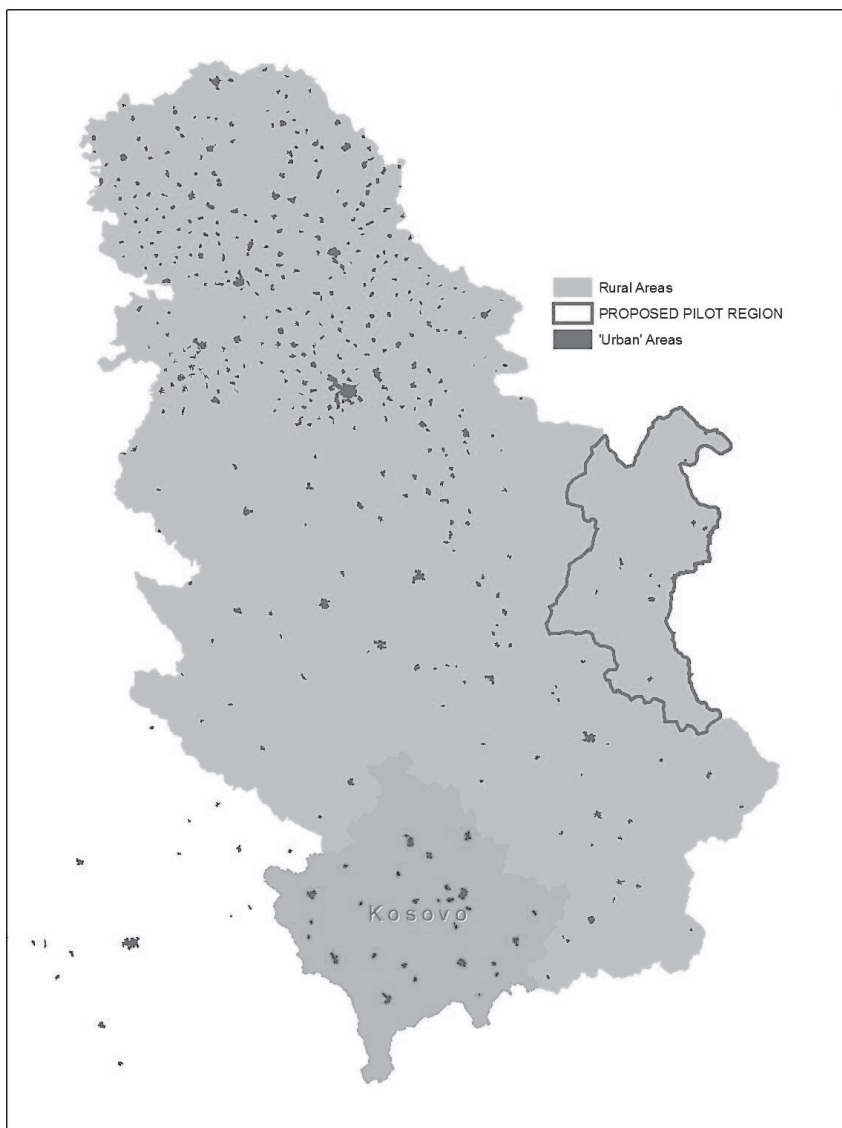
Statistical criteria were obviously not taken into account and this is a major methodological flaw. From the methodological standpoint, this is an important issue because any research focused on rural regions is at great risk with respect to data interpretation. Hence, the selection of relevant features and derived indicators to define rural areas in Serbia was determined by the following:

- Consideration of limitations resulting from the heterogeneous social, economic and natural geographic (spatial) characteristics of the region
- Consideration of limitations in availability of the data and information for some units (at national and lower levels). The existing subdivision into regional administrative units and the availability of statistics effectively constrain any approach to this problem[1] (Bogdanov and Stojanovic, 2006).
- The need to use internationally recognised criteria and standards to ensure the validity of comparisons with studies of other areas.

Other European countries are also faced with similar problems, especially the new member states (NMS) striving to reorganise their national statistics according to the generally accepted standards (IAMO 2004).

The OECD definition of rurality has been accepted in majority of countries. The OECD defines rural areas as those communities (NUTS V level) with a population density of less than 150 inhabitants per square kilometre. Based on this, the OECD has further developed a typology of rural areas (at NUTS III or NUTS II level), which characterises rural regions as Predominantly Rural (PR), Intermediate (IR) and Predominantly Urban (PU). In the recent EU report on "Rural Development in the European Union: Statistical and Economic Information" (DG Agriculture and Rural Development Report, August 2006), the OECD definition is used for the comparative analysis of the socio-economic situation of rural areas in member states[2].

For the purposes of the Rural Development Plan and for allowing comparisons with EU statistics, rural areas in Serbia have been defined according to the OECD criteria[3]. According to this definition 129 municipalities were characterised as

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1 A large number of indicators (even in the rich national statistics) is monitored only at the national and the regional levels. Projection of these indicators to the lower territorial units is often impossible or insufficiently reliable.

2 In the past for defining rural areas, the European Commission has also used the population density criterion, but at lower level <100 persons per km² (European Commission, "Rural Developments" CAP 2000, Working Documents, 1997)

3 Rural areas were defined in municipality level (NUTS IV) and not at NUTS V level, as required, due to statistical constrains.

rural, comprising 3,904 settlements (Map 2). Choosing the OECD definition for the rural areas will provide Serbia with the additional advantages of being able to compare the socio-economic make-up of its rural areas with those of the EU member states, and to benefit from best practice with respect to strategies, policies and interventions being implemented in similar areas of Europe.

Map 2. Rural areas of Serbia according to OECD criteria of rurality
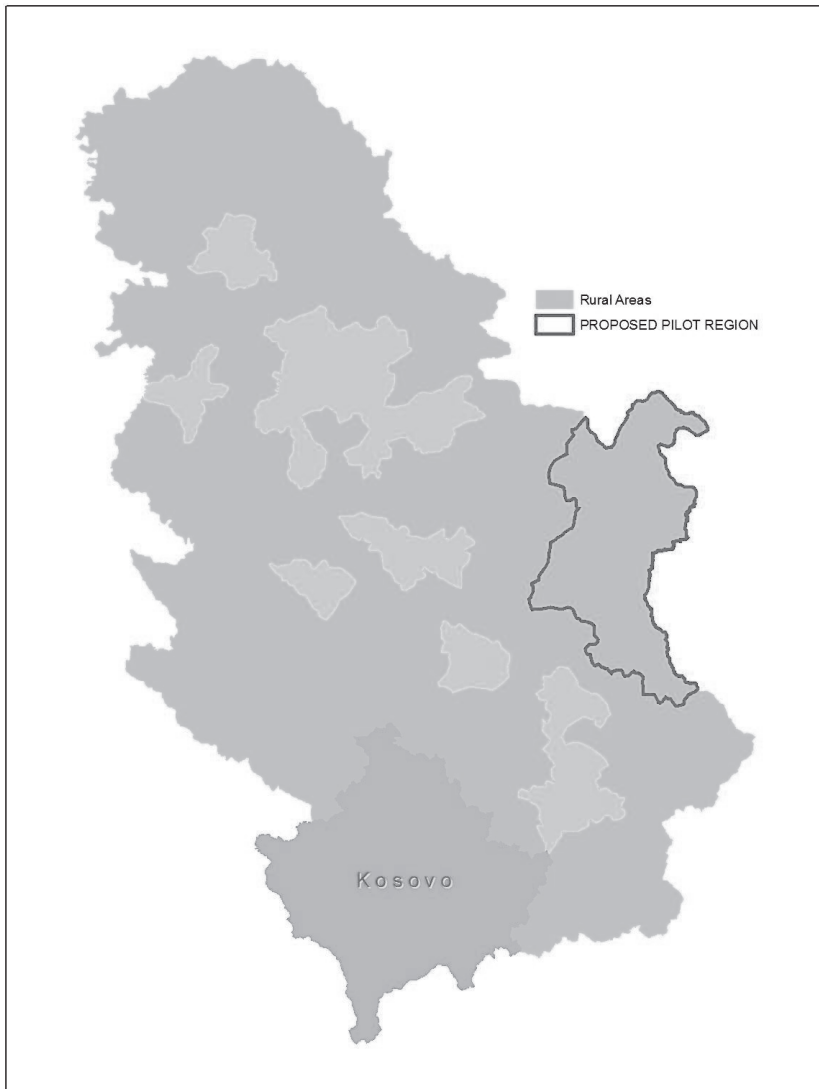
3.2 Serbia's Rural Mosaic

Recognising the diversity of rural areas is an important element of the rural development policy. This diversity is frequently referred to as the rural mosaic. For effective rural strategies and policies to be developed and implemented in rural areas, it is necessary to recognise these differences, identify their strengths and weaknesses and develop strategies which incorporate them

Various indicators have been used to develop typologies of rural areas. Drawing on McHugh (2001) and the Context Related Baseline Indicators and the Objective Related Baseline Indicators developed by the European Commission for the 2007-2013 programming period, eight thematic areas were identified. These comprised demographics, economic structures including employment, agricultural and tourism aspects, human capital, transport and telecommunications infrastructure and spatial characteristics. These indicators provide a good representation of the status and developmental potential of rural areas. The data collected therefore can be used to build highly complex models of rural areas and their structure, evolution and functioning for policy planning purposes.

Having defined rural areas, it was necessary to identify various types present in Serbia, given the diversity of such areas. Distinguishing factors include geographical characteristics (mountains, plain areas, valleys), accessibility (areas adjacent to cities, remote areas), population fluctuations and migration, infrastructure, differences in environmental conditions (e.g. protected areas), variations in agricultural use and productivity, degree of diversification of local economies (activities such as tourism, processing, manufacturing), etc.

Based on the above, a typology of the rural areas in Serbia was constructed using those variables which accounted for the greatest differences between areas. The following thematic or sectoral factors were considered most important: demographic structures, geographical characteristics, structure of the economy, structure of employment, human capital, agricultural structures, tourism and infrastructure. The 2002 Census provided most of the social, cultural and demographic variables and much of the economic data. However, there are a number of critical gaps in the data. These primarily relate to the structure of agricultural activities at the municipality level and the geographic and locational characteristics of each municipality. In the case of the geographic data, it was possible to develop a classification for municipalities based on their predominant topography (Table 1).

Table 1. List of indicators / variables used for the typology of rural areas in Serbia

	Demographic structures indicators		*Infrastructure*
1	Population density (inhabitants per km², 2002)	1	Number of telephones/1000 persons
2	Population change (in % 1991-2002)	2	Number of persons per doctor
3	Importance of young people (<15)	3	Road length/km2
4	Importance of aged people (>65)	4	High roads/km2
5	In or out migration rate		*Tourism capacities*
6	Demographic Viability (20-39/60+)	1	Number of hotel beds/1000 persons
7	EDR (employees/total)		*Agriculture*
	Gender	1	% of agricultural land
1	Gender ratio (25-44) F/M	2	Labour productivity (Serbia 100%)
	Geographical characteristics	3	Land productivity (Serbia 100%)
1	% of area under forestry	4	Average size of farm holdings
2	Topography	5	owned land
	Structure of the economy indicators	6	used land (own + rented)
1	% primary sector in NI*	7	% farms without income from agriculture
2	% secondary sector in NI	8	% part time farms
3	% tertiary sector in NI		*Farm distribution per size*
4	NI Serbia =100%	9	less than 1 ha
5	NI/Total number of employees	10	1 - 3 ha
6	% households with social payments	11	3-10 ha
7	% persons with social payments	12	over 10 ha
	Structure of employment indicators		*Age structure of active farmers*
1	% employees in primary sector	13	% of active farmers >65
2	% employees in secondary sector		*Average yields*
3	% employees in tertiary sector	14	wheat
4	% employees in public sector	15	maize
5	% self employees	16	potato
6	unemployment rate		
	Human capital indicators		
1	% without formal education		
2	% with primary school		
3	% secondary school		
4	% Faculty or college		

*NI – national income

Before classifying rural municipalities, it was necessary to undertake correlation analysis to assess the independence of each of the indicators relative to the others. Given the number of variables and nature of socio-economic data, one frequently finds relationships between two or more variables. The identification and removal of redundant highly correlated variables simplifies the interpretation of complex data sets and prevents specific groups of variables from unduly influencing the results of statistical analysis. The biggest problems were located in the statistical database:

1. Some districts (5-6) were declared municipalities only after the 2002 Census and for this reason lack the data needed for the comparison study.
2. Unreliable data on population in the south of Serbia.
3. Missing indicators (GDP, infrastructure, migration, employment).

Having identified 49 common indicators, seven were excluded, and the final dataset of 41 variables were to classify rural municipalities in Serbia using PCA.

The result of the analysis is a correlation matrix which separates statistically significant variables and measures their relative dependence. The variables related to agricultural land and farm structure showed a high degree of inter-relationship and were therefore excluded from subsequent analysis.

3.3 Classifying Rural Municipalities in Serbia

Extraction of principal components, also known as factor analysis, enabled the classification of rural municipalities based on core characteristics. Factor analysis assesses whether the selected variables can be explained with reference to a smaller number of variables called factors or components. Using this technique the 41 variables were reduced into eight principal components with eigenvalues greater than 1, also known as Kaiser's criterion. Factors with values less than one are excluded from further analysis as they are not significant in explaining the variance in the dataset. Cumulatively, the eight components with values greater than one account for almost 78% of the variance observed in the dataset of 41 variables. Table 2 highlights that the first three components account for approximately 53% of the total variance indicating that these are the most important components in terms of understanding the characterises of rural areas in Serbia. Conversely, the last three components account for just 7% of the variance and are thus of least significance.

Table 2. Total Variance Explained (Rotated Solution[4])

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumula-tive %	Total	% of Variance	Cumula-tive %	Total	% of Vari-ance	Cumu-lative %
1	8.754	26.528	26.528	8.754	26.528	26.528	6.169	18.693	18.693
2	5.089	15.422	41.950	5.089	15.422	41.950	5.515	16.712	35.405
3	3.568	10.813	52.762	3.568	10.813	52.762	4.138	12.540	47.946
4	2.746	8.321	61.083	2.746	8.321	61.083	2.856	8.655	56.601
5	1.707	5.171	66.255	1.707	5.171	66.255	2.292	6.946	63.547
6	1.524	4.619	70.874	1.524	4.619	70.874	1.823	5.523	69.070
7	1.145	3.471	74.345	1.145	3.471	74.345	1.528	4.630	73.700
8	1.112	3.369	77.714	1.112	3.369	77.714	1.324	4.014	77.714

Extraction Method: Principal Component Analysis.

An interpretation of the significance of each of the extracted components was undertaken with reference to the correlations between the 39 variables, the 'structure' of the component and the mapped component score. Brief profiles of the eight components follow.

Component One reflects the intersection between topography, 'stronger' agricultural areas, namely the northern area of Serbia, and municipalities with inward migration over the period 1990 – 2002. The grouping of these variables reflects the significance of agriculture in determining the broader socio-economic conditions within rural municipalities that give rise to and sustain immigration.

Component Two highlights areas dependent on manufacturing and other secondary sector activities. This component has a more random distribution and these statements are based on qualitative assessments by local experts. They reflect the historical legacy of a centrally-planned economy and, in the case of northern Serbia, the strength of the food processing industry.

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4   Un-rotated solutions frequently display high loadings on more than one component making their interpretation more difficult. It is however possible to rectify this issue without loss of variance or explanation, by rotating the solution so that variables have high loadings on some components and zero or close to it on others.

Component Three is dominated by demographic and human capital variables. Municipalities with younger populations are strongly represented in this category. They represent areas with high females/male ratios, indicating unique local socio-cultural conditions. Based on international research, it is likely that these areas are highly dependent on external transfers from males working in other regions of Serbia, or even in other countries.

Component Four reflects areas with higher levels of economic dependence on the tertiary sector. These are not always located next to urban centres, which suggests a high level of dependency on the tourist industry in certain rural municipalities.

Component Five includes areas with higher densities of roads in general and, more importantly from an economic development perspective, major highways in particular. These municipalities are located along the primary transportation corridors radiating southwards and westwards from Belgrade.

Component six, seven and eight are of relatively minor importance. They have eigenvalues greater than unity (one) but explain only approximately 8% of the total variance.

Component Six depicts a spread of municipalities that are dependent on public sector employment. They tend to be located around urban areas. The spatial pattern may well be distorted by public ownership of farms and other industries based in rural areas. In this instance it points to relative low levels of employment in some municipalities.

Component Seven scored highly on the health care variable, calculated as the number of doctors per 1000 inhabitants. Unsurprisingly, this variable appears to be spatially concentrated close to urban centres. However, there are some exceptions, particularly in western municipalities.

Component Eight, the least significant factor, is difficult to interpret. Low employment and the presence of younger people are the characteristic features of this component. Notwithstanding the relative insignificance of this variable, international experience suggests that areas with large groups of young people and low employment are at increased risk of social and cultural conflict, which may undermine economic development efforts.

3.4 Grouping Rural Municipalities in Serbia

The municipality level component scores were input into SPSS for statistical analysis. The clustering procedure was undertaken and the results mapped and interpreted with reference to the mean values for each cluster. It was apparent from an early stage that greater availability of data, particularly information pertaining to intra-municipality commuting, would improve the clustering process. However, in the absence of this and other data, the team undertook an iterative process whereby 2+1, 3+1, 4+1, 5+1 and ultimately 6+1 clusters or regions were identified and mapped (the '1' region representing those areas that were classified as urban using the OECD definition). Ultimately, the 6+1 region scheme was considered the most appropriate solution to Serbia for rural planning purposes. Other regional options were rejected on the basis that they did not fully capture the geography of Serbia's population and economy.

Table 3 depicts the final cluster centres emerging out of the clustering process. This is a useful summary of the structure of each cluster and its relationship to other clusters. Taking the example of Cluster 1 (Multifunctional Rural Economies) we find that municipalities assigned to this cluster have an average score of + 0.82955 standard deviations above the mean for the demography component as identified through factor analysis.

Table 3. Final Cluster Centres

	1	2	3	4	5	6
Agriculture	-0.627	-0.829	-1.548	1.020	-0.240	-0.601
Industry	-0.047	0.807	-0.700	0.239	-0.156	-0.681
Demography	0.830	-0.875	-1.027	-0.094	-0.352	-0.185
Public sector	-0.235	-2.377	3.160	0.173	-0.197	-0.729
Accessibility	-0.200	0.675	-0.040	-0.682	0.807	-0.545
Service dependency	-0.038	3.577	1.181	0.117	-0.533	0.334
Health care	-0.748	-0.160	-0.389	0.233	0.340	3.095
Infrastructure	0.217	0.149	0.349	-0.035	-0.352	6.008

Table 4 provides details regarding the distance between the final cluster centres, which facilitates comparison between clusters. Clusters with similar scores are similar with respect to a number of factors, whilst greater divergence in the scores suggests significant differences. So for example, regions three and four are very different whilst four and five are somewhat similar.

Table 4. Distances between Final Cluster Centres

Cluster	1	2	3	4	5	6
1		4.738	4.231	2.257	2.080	7.088
2	4.738		6.310	4.986	4.869	7.899
3	4.231	6.310		4.398	4.290	7.866
4	2.257	4.986	4.398		2.168	7.005
5	2.080	4.869	4.290	2.168		7.165
6	7.088	7.899	7.866	7.005	7.165	

3.5 Assessment

The data underpinning these clusters was extracted to produce regional profiles and this formed the basis of the team's assessment and selection of a 6+1 region solution. This regional framework was selected on the basis that it provides an accurate reflection of Serbia's topography with an agriculturally dependent northern region, a multifunctional rural area to the south divided by an area that is strongly influenced by urban centres, their hinterlands and major transportation routes. Three further area types were also identified. These represent municipalities with specific socio-demographic profiles. Though statistically they are significant, they account for a very small number of municipalities (7%). Furthermore, assessment of these areas shows that their basic economic profile reflects that of the surrounding municipalities. Given that the objective of this research was to identify rural regions for economic development purposes it is valid to group these areas into the surrounding regions. Effectively this leaves a 3+1 regional framework for the purposes of rural development planning and programme implementation; an agricultural region, a multifunctional rural region and areas with economies strongly influenced by urban centres and transportation infrastructure.

Map 3. The territory of Serbia according to the types of rural areas identified
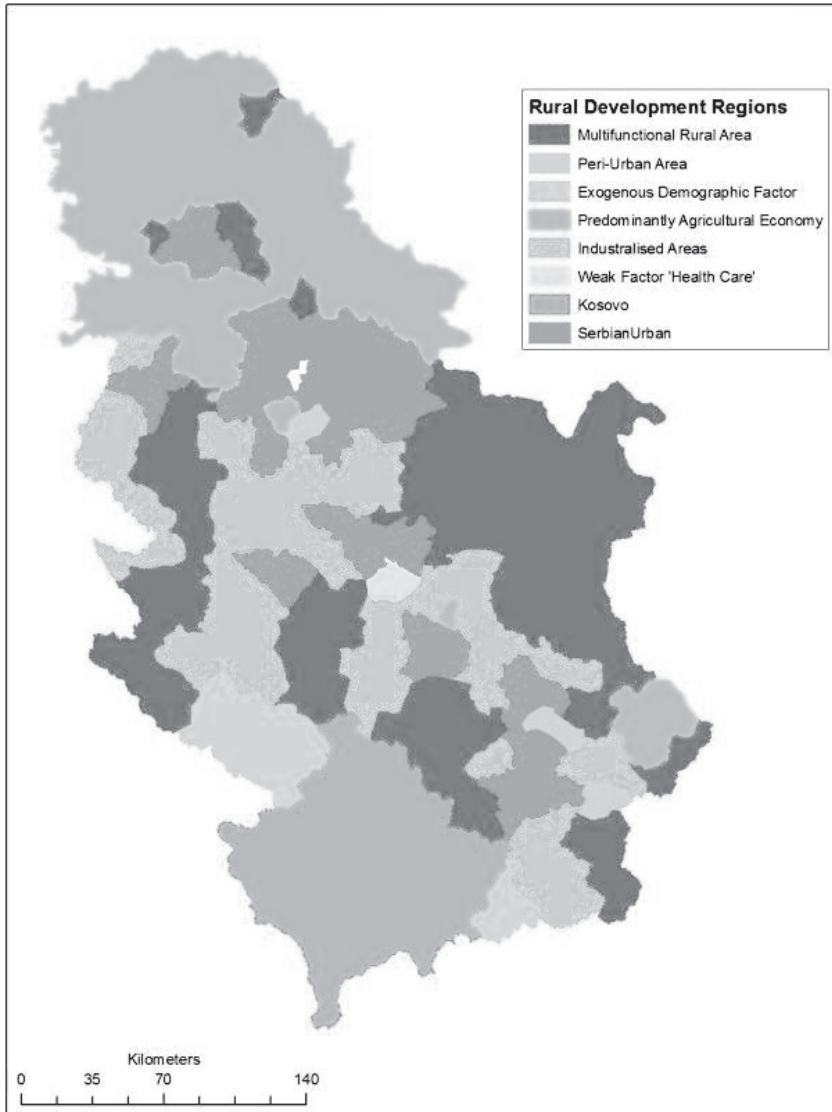
Following a thorough review of the initial data and the results of the cluster analysis, the original borders of some of the rural areas have been redefined. These adjustments were made for the following reasons:

- The initial solution envisaged six types of rural area, two of which included less then 5% of the total number of municipalities. This level of detail is unhelpful in the context of creating particular developmental solutions. This process followed the principle that *baseline indicators* must be consistent with those of the areas they were merged with.
- It became apparent that *the relevant qualitative characteristics of certain regions cannot be fully expressed with statistical indicators*. It is often simply not possible to draw clearly defined borders, especially in agricultural regions, even given the small scale of some of the units involved. Thus, in instances where correlations were not particularly strong, municipalities on the edges of certain regions were transferred to an apparently more suitable grouping on the basis of other, immeasurable factors.

Following the subsequent analysis and adjustment, four rural region types have been defined in Serbia, as shown in the Map 4.

Map 4. The territory of Serbia according to the types of rural areas identified
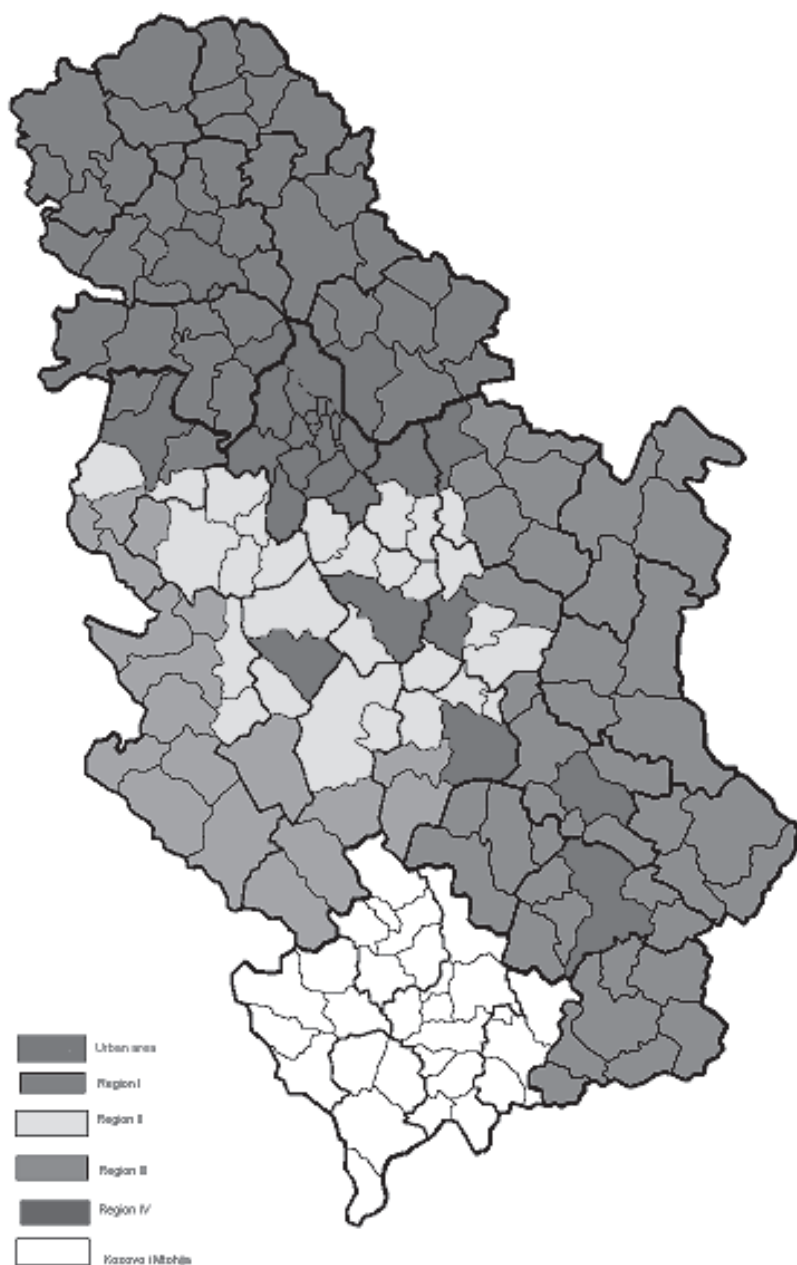
The characteristics of the four types of rural areas in Serbia are as follows.

Highly productive agriculture and integrated economy (Region I) – This region contains the most fertile land and is thus dominated by intensive, well-funded agricultural production. Compared to other parts of Serbia, it is characterized by more benign demographic trends, increased entrepreneurship, a diversified industrial sector and a well developed physical and economic infrastructure. Economically, this region is the most developed and well integrated.

Small urban economies with labour intensive agriculture (Region II) – This region comprises the areas around the major urban centres and the larger towns and their immediate surroundings. The economy is dominated by intensive farming (the production of fruit, vegetables and livestock) to feed the great number of consumers in the adjacent cities and towns, and consequently has the lowest unemployment rate in Serbia. Compared to other parts of Central Serbia, the infrastructure, economy (especially with regard to productivity rates) and access to communal and public services are better developed.

Natural resources oriented economies mostly mountainous (Region III) – Due to variation in geographical characteristics, this region is highly heterogeneous. The economic structure is based on the exploitation of natural resources, through mining and agriculture. Unfavourable demographic trends are typical of this area, with the highest rates of rural poverty and unemployment in Serbia. Facilities to process the raw materials produced are lacking, but their development offers a way to improve the local labour market.

High tourism capacities and poorly developed agriculture (Region IV) – This region comprises those parts of Serbia with the greatest tourism potential and the highest rate of tertiary-sector contribution to the economy. Agricultural output of feedstuffs is underdeveloped.

Table 5 provides detailed information on the defining characteristics of the four types of rural region.

Table 5. The characteristics of defined rural regions in Serbia

	Serbia	Rural areas	Regions			
			I	II	III	IV
1. Geographical characteristics						
Total area, km2	77508	65952	20229	12642	22278	10803
No. of settlements	4715	3904	471	993	1569	871
Average population/settlement	1590	1066	3300	1094	616	637
Population density	97	63	77	86	43	51
2. Population and human development indicators						
% population changes 2002/1991	98,96	96,35	100,00	97,34	90,69	95,04
In - out migration rate	1,48	-0,14	5,81	0,43	-5,43	-7,43
Aging rate	1,05	1,08	1,02	1,17	1,28	0,78
Educational structure of population >15:						
• Without education, % of total	21,84	28,19	24,16	28,67	34,74	27,14
• Primary education, % of total	23,88	26,69	26,41	25,42	27,51	28,62
• Secondary school, % of total	41,07	36,09	41,10	36,69	27,35	36,11
• Faculty education, % of total	11,03	6,95	7,53	7,29	5,87	6,55
• Unknown, % of total	2,18	2,07	0,80	1,94	4,53	1,59
3. Employment						
• Primary sector, % of total	23,36	32,98	30,75	32,68	36,30	34,20
• Secondary sector, % of total	30,08	30,69	31,20	30,79	29,11	31,72
• Tertiary sector, % of total	24,82	18,60	20,28	19,41	15,35	17,80
• Public sector, % of total	18,94	14,84	15,57	14,09	15,08	13,94
• Unknown, % of total	2,80	2,89	2,20	3,03	4,17	2,34
Unemployment rate (%)	22,22	21,32	22,40	19,69	20,33	23,22
% of employed in agriculture	21,96	31,45	30,14	31,19	32,93	33,06
4. GDP						
GDP per capita in Serbia = 100%	100,00	73,69	96,72	70,32	51,43	54,57
• Primary sector, % of total	19,33	32,48	33,24	30,25	38,63	24,24
• Secondary sector, % of total	39,48	41,12	42,36	39,71	38,16	43,36
• Tertiary sector, % of total	40,79	26,06	24,14	29,67	22,64	32,08
• Public sector, % of total	0,40	0,34	0,27	0,36	0,57	0,32
% agriculture	16,33	29,81	29,93	28,19	36,48	22,35
Primary sector productivity Serbia=100%	100,00	87	128	74	69	47
Secondary sector productivity Serbia =100%	100,00	75	102	65	53	57
Tertiary sector productivity Serbia = 100%	100,00	62	71	61	48	60
5. Agriculture						
% agricultural land of Total area	65,97	65,30	83,29	64,34	55,03	53,95
Structure of agricultural land:						
• Arable land	65,40	62,78	87,79	60,48	47,52	25,79

• Orchards and vineyards	6,07	5,59	1,77	11,05	6,51	7,10
• Meadows and pastures	27,80	30,88	8,64	28,34	45,93	67,11
• Rest	0,74	0,74	1,81	0,13	0,04	0,00
Livestock						
• cattle/100 ha arable land	25,37	24,85	14,62	37,47	23,96	47,03
• pigs/100 ha sown land	94,65	91,19	80,20	131,20	84,00	96,25
• sheep/100 ha agriculture land	30,82	31,91	13,01	57,99	26,42	61,72
Average farm size	3,60	3,94	3,53	3,72	4,25	4,76
Land productivity (Serbia = 100%)	100	88,62	111,48	110,52	61,77	48,44
Labour productivity agric. (Serbia = 100%)	100	93,58	131,22	80,13	79,34	49,46
6. Tourism						
No of beds/1000 residents	11,20	13,71	4,29	17,31	15,18	30,53
Overnights/no of beds	79,09	78,75	80,00	67,23	73,00	96,06
7. Infrastructure						
No of telephone users/1000 residents	331	284	292	292	274	261
No of residents/1 doctor	369	512	566	457	470	584

Source: The Census of population, households and flats 2002 - Population, books 2,4,5,6,7,11,14,15,19 and Agriculture, books 1,2,3; Statistical annuals The Municipalities in Serbia (2006); Bureau of Statistics of the Republic of Serbia, Belgrade

4. Conclusion

Effective rural development policies must be based on an accurate classification of the essential characteristics of the various regional types. Such a framework allows the identification of both needs and opportunities in the rural areas. In the past, the lack of universal definition of rurality and widely different approaches in formulating rural typologies, resulted in a territorial approach to development that was fragmented and strongly focused at just a very local level. Although it is now widely accepted that rural areas are not homogeneous, it is necessary to establish sets of indicators that can both reflect the specific characteristics of, and distinguish between, the main types of rural landscape.

On the basis of all the analyses performed, it is concluded that the Serbian countryside can be divided realistically into four basic types. The differences between the defined types are significant and must be incorporated into the preparation of a state-wide rural development policy and development planning at local levels. . The scheme described above highlights both problems and opportunities for each of the rural types, enabling effective planning and implementation of suitable measures.

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