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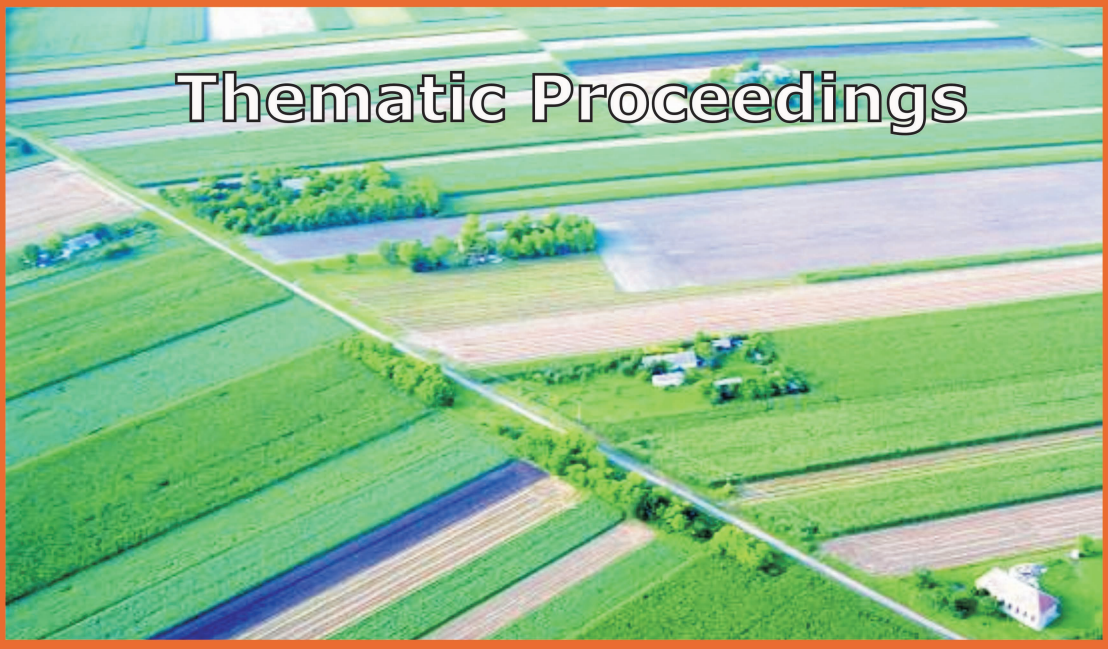

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DEFINING RURAL AREAS IN SERBIA AND THEIR TYPOLOGY

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INTRODUCTION

The main objective of this paper is to present the methodology developed, the indicators selected for defining rural areas in Serbia and the statistical analysis of the classification of these rural areas.

From the first definition to the current one the concept of *rurality* has been made more extensive and more profound. Originally, a rural region was viewed as a residual of an urban center (very often rural areas are simply defined as those areas that are not urban "non-urban areas"). The term "rurality" relates to the specific set of characteristics, which could not be used as criteria in defining of rural areas. It is important to note that the definition of rural areas differs among countries and it also differs among European member states. The most often used criteria are the population density and the population size of the settlements. However, it is possible to use also other criteria to define the rural area, such as those relating to the territorial and/or sectoral characteristics. Although "rurality" is related with 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.

Nevertheless, the dynamic changes in "metropolis - periphery" relationship and the growing dichotomy between urban and rural areas have made it necessary to define a clearer conceptual framework for the rural development policy. For developing typologies of rural areas, various indicators have been used. Most characteristic ones are the Eurostat Sustainable Development Indicators. The EU PAIS Project (PAIS - Proposal on Agri-Environmental Indicators) had a goal to assist in formulating and unifying indicators for monitoring the state in the agri-environment, with the focus on environmental indicators, agricultural practice and rural development. The World Bank published in 2000 the "Rural Development Indicators Handbook", which brought together a large set of statistical indicators at regional (international) and national levels[4]. The indicators chosen were largely

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[4] The significance of unifying developmental parameters, highlighted in the World Bank document: "Rural Development: from Vision to Action", 1997, was partly realised with

compatible with the disaggregated Analytical tools of Human Development which were defined in 1990 by the UN for the purpose of monitoring quality of life and social differences in certain parts of the world (HDR- Human Development Report).

For comparison reasons and for benefiting from policies designed for European rural areas (EC Regulation 1257/1999 and EC Regulation 1698/2005), it will be very useful for Serbia to define its rural areas by applying the EU and the OECD definition and identify similarities and differences in its rural areas with Member States rural areas. The definition of the rural areas in Serbia should also take into consideration prevailing administrative and socio-economic structures. To face these problems, the methodology used for defining rural areas in Serbia follows the steps outlined below:

- It reviews indicators used in Serbia and in European Union for defining "rural" and selects the most meaningful and appropriate for the definition of rural areas in Serbia
- It reviews indicators/variables used for classifying rural areas at European level and selects the most appropriate for the typology of rural areas in Serbia, taking into consideration data availability and administrative structures.
- It undertakes statistical analysis (factor and cluster analysis) that identifies homogeneous clusters of rural areas
- It identifies main characteristics of the clusters.

THE METHODOLOGY FOR DEFINING RURAL AREAS IN SERBIA

European Union applies OECD's definition for European rural areas. 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 the Member States[1]. 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).

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this Handbook. However, there is an emphasis on the necessity of further advancement, systematic and continual monitoring of parameters, as well as joining efforts to reach consensus in view of this problem matter.

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Table 1 Main characteristics of Serbian rural areas

Indicators	Serbia Total	Rural Areas	% Rural/ Total Serbia	EU 25 PR Areas
Total Area (Km^2)	77508	65952	85.1	56.2
Population (2002)	7498001	4161660	55.5	
Population density 2002	96	63		38.5
Population change (1991-2002) in %	-1.04	-3.65		
Age Structure:				
Over 65 years of age (%)	16.5	17.5		16.6
Below 15 years of age (%)	15.7	16.2		17.6
Employment by sector:				
Primary sector (%)	23.36	32.98		13.2
Secondary sector (%)	30.08	30.69		28.7
Tertiary sector (incl. public sector) %	43.74	33.44		58.1
Unknown	2.80	2.89		-
GDP per capita index, Serbia =100	100	73.7		74.1
Unemployment (%)	22	21		11.6
Infrastructure:				
No of telephones/ 1000 persons 2004	331	284		
Number of persons per doctor, 2004	369	512		
Tourist accommodation:				
Number of hotel beds	83993	57074	67.9	
Number of overnights	6642623	4494773	67.6	

Source: "Report on selecting pilot rural regions for rural development programming purposes", Belgrade, October 2006, European Union Project: EuropeAid 119156/D/SV/YU "Support to Rural Development Programming and Payment System" *and own compilation*

In Serbia there is actually no statistical definition of rural regions. The classification of settlements as urban, rural and mixed was used in census conducted in 1953, 1961 and 1971 and the size of the settlement and the ratio of agricultural compared to the total population was used as the criterion. Unfortunately, this approach was abandoned and in census conducted in 1981,

1991 and 2002, the classification of settlements was: urban and other settlements. Based on the decisions of the municipality whereby the municipality itself declared a settlement the status of the city provided it had met the requirements of the general plan for urban arrangements. Thus the settlement can be declared urban following the decision of the municipality's assembly. Settlements not declared urban were considered rural. Statistical criteria were obviously not taken into account and this is a major methodological restriction. From a methodological standpoint, this is a complex issue because any research focused on rural regions is of great risk with respect to data interpretation.

For the purposes of Rural Development Plan and for allowing compararisons with EU statistics, rural areas in Serbia have been defined according to OECD criteria[1]. According to this definition 129 municipalities characterised as rural out of the total of 165 municipalities, consisting of 3.904 settlements. Choosing the OECD definition for the rural areas, it will provide Serbia with an additional advantage of the comparability of its rural areas socio-economic situation to that of the EU member States and in benefiting from good practices in strategies, policies and interventions implemented in similar areas of Europe.

THE TYPOLOGY OF RURAL AREAS IN SERBIA

Upon defining rural areas, it was necessary to identify various types of rural areas that prevail in Serbia, as it is recognised that rural areas are not homogeneous (diversity of rural areas). There are differences among them and these may be due to various factors such as geographical characteristics (mountain areas, plain areas, valleys), accessibility (rural areas close to cities, remote areas), population changes and migration, infrastructure, different environmental conditions (protected areas) favourable or disadvantaged agricultural structures, diversified local economies (development of economic activities such as tourism, processing, manufacturing) etc. Based on the above, it was decided to construct a typology of the rural areas in Serbia, by using those indicators (variables) that account for differences among the rural areas, considering also data availability at municipality level. The following thematic or sectoral factors were considered important for explaining differences among rural areas of Serbia: Demographic structures, Geographical characteristics, Structure of the economy, Structure of employment, Human capital, Agricultural structures, Tourism and Infrastructure.

[1] Rural areas were defined in municipality level (NUTS IV) and not ant NUTS V level, as required, due to statistical constrains..

The analyses encompassed 129 municipalities defined as rural. In the procedure of defining the types of rural areas, the following methodological procedures were implemented:

- Defining list of indicators
- Correlation Analysis
- Factor Analysis
- Cluster Analysis

Major methodological problems and limitations were connected to available statistical database:

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

Defining the list of indicators/variables – The chosen indicators can be divided into several groups: Demographic structures indicators, Gender, Geographical characteristics, Structure of the economy, Structure of employment, Human capital, Infrastructure, Agriculture and Tourism capacities (Table 2)

Initially formulated list of indicators was changed and adjusted during the statistical processing.

The Correlation analysis was made on the basis of 51 initial indicators, which were later adjusted and reduced. Result of the analysis is a correlation matrix which separates statistically significant variables and measures its relative dependence. The variables related to the agricultural land and farm structure have shown a high level of inter-relation, therefore they have been excluded from the further analysis.

The Factor analysis was carried out by a main factor method, using the final list of 39 variables. On the basis of the determined distinctive equations and its roots, using the Kaiser criteria certain number of factors, which should be kept as relevant for further analysis, has been determined (only common factors with a distinctive root higher then one are kept). After that, the orthogonal rotation of the primary factor of an equation root by Keser Varimax method was performed. Factor matrix was acquired by rotation, and its elements are factor ponders, and ponders with a value higher then 0.7 are regarded as significant and on the basis of their connectivity with a significant factor the interpretation of the factor was performed. Factor analysis was completed with the eighth factor, which encompasses 76% of the total number of variations of the 39 analyzed factors. After the rotation of the initial factor matrix, the factors suitable for interpretation were derived by VARIMAX method, and depending on their relation to the initial variables they are

Table 2 List of indicators / variables used for the typology of rural areas in Serbia

	Demographic structures indicators		***Infrastructure***
1	Population density (persons 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		***Tourism capacities***
6	Demographic Viability (20-39/60+)	1	Number of hotel bads/1000 persons
7	EDR (employees/total)		***Agriculture***
	Gender	1	% of agricultural land of total area of municipality
1	Gender ratio (25-44)F/M	2	Agric ND/No. of employ. in Agr (Serbia 100%)
2	***Geographical characteristics***	3	ND in Agriculture/agricultural land Serbia 100%
3	% of area under forestry	4	Average size of farm holdings in ha
4	Topography	5	owned land
	Structure of the economy indicators	6	used land (own + rented)
1	%primary sector in ND*	7	% farms without income from agriculture
2	% secondary sector in ND	8	% part time farms
3	% tertiary sector in ND		***Farm distribution per size***
4	GDP Serbia =100%	9	less than 1 ha
5	GDP/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 yield**
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		
5	%unknown		
6	% unemployment female		

* ND – national income

identified as: Agriculture, Industry, Demography, Public sector, Accessibility, Service dependency and Infrastructure. First four factors (and variables/indicators describing them) have quite a strong influence on the observed situation, while the remaining four are also statistically important, but with the minor impact.

The cluster analysis The technique of grouping municipalities in the homogenous groups is based on the principle of determining the distance of each municipality from all the others and also on separation of those which are least distant from each other in some iteration. Thus, the least different municipalities are grouped first, and then the municipalities with decreasing intensity of similarity of the chosen indicators. The unique degree of similarity of elements is formed in the last iteration. In order to meet the demands of its basic task, the grouping analyses require defining the measure of proximity of objects (municipalities) on the basis of their characteristics. Therefore, based on the matrix database, the matrix of the proximity is defined, and its elements measure the degree of similarity or difference between these pairs of objects. The measure of proximity often reveals mutual differences between any of the two observed units that are to be grouped. The logic control of the cluster analysis results has shown that it would be sufficient to define 6 homogenous groups of municipalities as a representative case for Serbia.

CONCLUSION

Concerning the initial solutions and results of the cluster analysis, some corrections have been made regarding the territorial extent of certain types of rural areas, i.e. redefining of their borders. The correction of the borders of the regions was made for the purpose of:

✓ The initial solution envisaged six types of areas, of which two types included 4, i.e. 6 municipalities. The assessment showed that this solution was not rational enough in the context of creating particular developmental solutions. It was decided, that these municipalities shall be classified into adequate types of areas surrounding them. While regrouping the municipalities according to the regions, the principle that *basic indicators* must be consistent to the type of area the municipality is classified into was respected / observed.

✓ Taking into account that *the relevant qualitative characteristics of certain regions cannot be fully expressed with statistical indicators*. The borders of the regions, especially agricultural ones, have never been explicitly defined nor can they be clearly drawn even on the level on small units observed. Thus it is difficult to draw a definite border of a region among the municipalities having similar natural resources or even using some common potential. Hence it was necessary for some of the municipalities situated on the edges of particular regions, where it

is shown that the influence of natural and some other immeasurable factors is not expressive enough, to be transferred to an adequate type of rural area.

Defined types of rural areas which are assessed to be homogeneous enough to represent the particularities of rural area types of Serbia are:

Highly productive agriculture and integrated economy – this region has favorable natural conditions and structure of agricultural production dominated by more intensive capital activities compared to other rural areas of Serbia. In comparison to other parts of Serbia, bigger human potential, distinctive enterprenuership, diversified industrial sector and developed physical and economic infrastructure of this region ensured more favourable indicators of overall economic development and more integrated economy.

Small urban economies with labour intensive agriculture – this region covers the area of urban centers perimeter and the areas of bigger towns and their surroundings. Economic structure and the productivity rate of certain sectors are more favourable compared to other parts of Central Serbia. Considering the proximity of the market with a great number of consumers, the structure of the agricultural production is oriented towards intensive farming products (fruit, vegetables, intensive livestock farming).

Natural resources oriented economies mostly mountainous – according to its geographical charateristics, this region is highly heterogeneous. Economic structure is bases on the exploitation of the rich natural resources – mining and agriculture. Unfavourable demographic trends are a particularity of this area. The region covers the territory of Serbia which has the highest rate of rural poverty and total unemployment.

High tourism capacities and poor agricultural structures – This region represents the part of Serbia with the greatest tourism potential and the highest rate of tertiary sector contribution to its economic structure. Agricultural structure is undeveloped and based on the utilization of natural resources of feedstuff.

The quantitative and qualitative analyses based on this typology serve as a valid and objective methodological basis for designing a Rural Development Plan of Serbia.

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