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Importance of rural areas and the regional profiles of EU member states

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Abstract: *The paper presents in an original manner the theme of EU "importance of rural areas", based on the two context-related baseline indicators presented in the Rural Development Report 2013, for EU Member States, at year 2010. After presenting the importance of classification the territorial units for regional statistics in EU, and the urban-rural typology of regions, the study describes the "importance of rural areas" for the Romanian regional profile. Using cluster classifying method, in SPSS there were identified two clusters of EU countries which define two types of regional profiles. By applying the multivariate factorial method of Principal Components Analysis, in SPSS, the regional profiles of EU Member States were defined, in the context of "Importance of rural areas".*

Key-words: *rural development, regional typology, Principal Components Analysis, Clusters*

1. Introduction

The Rural Development in the EU 2013 contains a chapter about "Statistical description of rural areas". This chapter is structured according to the following thematic items: importance of rural areas, socio-economic situation of rural areas, sectoral economic indicators, environment, diversification and quality of life in rural areas and LEADER program implementation. (http://ec.europa.eu/agriculture/statistics/rural-development/2013/index_en.htm)

The indicators of the Report 2013 cover the objective- and context-related baseline indicators which have been already defined in the Common Monitoring and Evaluation Framework (CMEF) for the Rural Development Policy over the period 2007-2013. (http://ec.europa.eu/agriculture/statistics/rural-development/2013/indicators_en.pdf)

This study referrs only to the first theme *Importance of rural areas*, which in the Report covers two context-related baseline indicators: *context 1 - Designation of rural areas,* and *context 2 - Importance of rural areas.* The *Designation of rural*

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areas is based on the classification the territorial units and on the urban-rural typologies established by European Commission. The *Importance of rural areas* is presented in a comparative way for the EU Member States, using multivariate methods of analysis.

2. Objectives

The main objectives of this study are:

a) To present the classification the territorial units for statistics in EU, in order to understand the content and the approach of urban-rural typology of regions in EU. The system of urban/rural typologies using the criteria of population and contiguity is sustained by the importance of regional classifications for regional statistics;
b) To analyse the two context indicators for describing the Romanian profile of EU regional typology, in 2010;
c) To describe the regional profiles of EU Member States, in the context described by the *Importance of rural areas*.

These objectives are attained by analysing the EU reports, and applying multivariate factorial reducing methods of Principal Components Analysis (PCA) and Cluster classifying method, in SPSS.

3. Methodology

This study will approach the two main context-related baseline indicators of *Importance of rural areas*.

The first context -related baseline indicator of *Designation of rural areas* is seen after understanding the importance of NUTS classification the territorial units for statistics in EU. The three steps approach of urban-rural typology of NUTS 3 level regions in EU is used in a system of urban-rural typologies using the criteria of population and contiguity. The *Designation of rural areas* is a dynamic context indicator and the regional typology of NUTS 3 regions can be updated.

The second context -related baseline indicator *Importance of rural areas* is based on four sub-indicators which refer to percentages of territory, population, Gross Value Added and employment for each type of region: predominantly rural, intermediate and predominantly urban – in each EU Member State. The indicator *Importance of rural areas* considers the region types resulted in the first context of *Designation of rural areas*. The indicators for the EU-27 and for all Member State in 2010 are analysed with descriptive multivariate methods.

Both context-related baseline indicators are analysed in a descriptive way, establishing clusters of EU Member States after their regional profiles.

4. Results and Discussions

4.1. Classification the territorial units for statistics in EU

A common classification of territorial units for statistics (NUTS) is important for statistical purposes, in order to harmonize the national statistics at EU level. NUTS can ensure the data comparability during the processes of data collection, transmission and publication of national and EU statistics.

The *Nomenclature of territorial units for statistics*, abbreviated NUTS from French language, is a geographical classification of the economic territorial units of the national territories of EU Member States into three different levels of regions, from larger to smaller. For defining a NUTS territorial unit, the delimited geographical area must have an administrative authority, which is legally and institutionally acting in the Member State. There were established the following thresholds of residential population, in Table 1, in order to ensure the regions comparability in terms of population size. The NUTS administrative units of a Member State have a lower and an upper limit of an interval of the residential population in that area.

NUTS level	Minimum limit (pers.)	Maximum limit (pers.)
NUTS 1	3 million	7 million
NUTS 2	800,000	3 million
NUTS 3	150,000	800,000

Table 1. *Intervals of population for NUTS classification*

The NUTS classification from 2013 which is considered in EU starting with 1st of January 2015 is recording: 98 regions at NUTS 1, 276 regions at NUTS 2 and 1342 regions at NUTS 3 level.
(http://ec.europa.eu/eurostat/documents/35209/35256/Urban_rural_poster_3levels_A1_Aug2013.pdf/06a732d8-b614-4c81-844e-c0a9e330aec0)

4.2. Urban-rural typology of NUTS regions in EU

European Commission established in 2010 the new typology for classifying the NUTS 3 regional areas in European Union as *predominantly rural*, *intermediate* or *predominantly urban* regions. (http://ec.europa.eu/eurostat/statistics-explained/index.php/Eurostat_regional_yearbook)

This approach was undertaken for a more consistent description of regions in the European reports an publications, for communications and in order to offer a common base of regional European policies and financing programs to reduce the economic disparities between urban and rural areas.

The level NUTS 3 regions are classified on this typology, in three steps: a) defining the rural areas; b) classification of the regions; c) presence of a city.

a) The urban clusters are contiguous grid cells which have a minimum population density of 300 inhabitants per km² and a minimum population of 5,000 inhabitants. The grid cells which do not correspond to these conditions are considered as rural.

b) The NUTS 3 regions are classified based on the share of population living in rural grid cells:

- The region "*predominantly rural*" (PR) has more than 50% of the total population in rural grid cells;
- The "*intermediate region*" (IR) has between 20% and 50% of the population lives in rural grid cells;
- The "*predominantly urban*" (PU) region with less than 20% in rural grid cells.

c) The presence of a city can re-classify the region depending on the size and the weight of its population in the regional one.

A *predominantly rural* region or group of regions can become *intermediate* if there exists an urban centre having more than 200,000 inhabitants, being no less than 25% of the regional population. An 'intermediate' region or group of regions can be re-classified as *predominantly urban* if there exists an urban centre having more than 500,000 inhabitants which represent no less than 25% of the regional population.

This approach has been developed in a system of urban-rural typologies by DG of Regional and Urban Policy in co-operation with DG Agriculture and Rural Development, Eurostat, DG Joint Research Centre and OECD.

4.3. The EU system of urban-rural typologies

The EU regional and urban policy considers three levels of urban/rural classification based on population distribution, as it follows:

a) *First level of grid cells* of 1 km² uses criteria of population density and contiguity. The population figures are obtained from registers or from local administrative units (LAU).

- The grid cells outside urban clusters are *rural grid cells*;
- Contiguous cells (including diagonals) with a density of at least 300 inh./km² and a minimum of 5,000 inhabitants are *urban clusters*;
- Contiguous cells (without diagonals and with gap filling) with a density of at least 1,500 inh./km² and a minimum of 50,000 inhabitants are *urban centres*.

b) *Second level of local administrative units (LAU 2)* considers the *degree of urbanisation* of local administrative units classified based on the share of local population living in urban clusters and in urban centres.

- *Rural areas* are *thinly populated* with at least 50% of population living in rural grid cells;

- *Towns and suburbs* with *intermediate density* < 50% of population in rural grid cells and < 50% of population in urban centres;
- *Cities* are *densely populated* with at least 50% of population living in urban centres.

c) *At third level of NUTS 3 regions* is applied the urban/rural typology, based on the share of regional population living in rural grid cells and in urban clusters.

- *Rural regions* with at least 50% of population living in rural grid cells.
- *Intermediate regions* with at least 50% of population living in urban clusters.
- *Urban regions* with at least 80% of population living in urban clusters.

The methodology of urban-rural typology was applied in 2012 to classify the Local Administrative Units (LAU2). There were established three degrees of urbanisation for local administrative units using the same approach: densely-populated areas/ cities/ large urban areas, intermediate density areas/ towns and suburbs/small urban areas, thinly-populated areas/ rural areas.

4.4. Importance of regional classifications for regional statistics

The regional statistics are based on NUTS classification. The socio-economic analyses based on NUTS classification offer objective bases in defining the geographic eligibility for EU funds for allocation of European funds.

The regional statistical indicators are important in evaluating the efficiency and the impact of EU funding for the increasing of living life level of population and reducing the disparities between urban and rural area. Depending on the regional GDP per inhabitant (in PPS) as yearly or average over a period, the NUTS 2 regions are ranked and grouped as: *less developed regions*, having: GDP/inh. < 75% of the EU average; *transition regions* with: 75% < GDP/inh. < 90% of the EU average; *more developed regions*, having: GDP/inh. > 90% of the EU average.

The rural regions can be analysed with data available at NUTS 3 level, by calculating aggregate indicators by type of regions, in order to emphasize the differences between the types of regions or to evaluate the analyzed indicator for the predominantly rural regions. The problems for rural development statistics are in the predominantly rural regions, about the higher unemployment risk, about the ageing of labour force and of population, the development of different activity sectors.

4.5. The Romanian regional profile

For one EU Member State, NUTS 1 represents the major socio-economic regions at *national* level; NUTS 2 referrs to the basic regions for the regional policies, and NUTS 3 are small regions which are the counties, in Romania.

Romania has 42 territorial units at NUTS 3 level consisting of 41 *counties* and Bucharest area. At NUTS 2 level there are 8 *administrative regions*, which are grouped in 4 *macro-regions* at NUTS 1.

The urban-rural typology of NUTS 3 regions is applying in Romania at county level. The 42 counties are grouped as it follows: 25 counties are *predominantly rural* regions, making up 59% of all, 15 counties are *intermediate regions* representing 36% and 2 regions are *predominantly urban*, being 5%.

The context *Importance of rural areas* is described within the "*Indicators in the Rural Development Report 2013*" by the following 4 sub-indicators: % territory in rural areas, % population in rural areas, % Gross Value Added in rural areas, % employment in rural areas.

Sub-indicators *in:*	***Types of regions***		
	predominantly rural	*intermediate*	*predominantly urban*
% Territory	59.8	39.4	0.8
% Population	45.6	43.8	10.5
% GVA	32.7	42.1	25.1
% Employment	41.8	46.2	12.0

Table 2. *Importance of rural areas in the Romanian regional profile, in 2010*

The weights of territory typology of Romanian counties, the weights of population in regional profiles of Romanian counties, the weights of Gross Value Added and of employment in the types of regions, in 2010, are presented in Table 2.
(Rural Development in the EU – Statistical and Economic Information Report 2013, http://ec.europa.eu/agriculture/statistics/rural-development/2013/index_en.htm)

4.6. Importance of rural areas in the context of regional profiles of EU States

The *importance of rural areas* is analysed firstly using only the dimension of territory indicators, by cluster method of classifying and then using all its four indicators of region types, with Principal Components Analysis, in SPSS.

4.6.1. Territory profile of regional typology of EU countries

Applying the classifying method of Cluster after the *nearest neighbours*, there was initially established the following regional typologies of two clusters, as in Table 3.

Initial Cluster Centers			**Final Cluster Centers**	
	Cluster		Cluster	
	1	2	1	2
rural_terr	2.10	82.40	31.49	65.18
interm_reg	53.80	7.70	46.77	27.77
urb_reg	44.10	9.90	21.74	7.03

Table 3. *Initial and final regional profiles of clusters*

Initial percentages of territory types showed an obvious *predominantly rural* profile of some EU Member States in second cluster, and an *intermediate* profile for the countries in first cluster.

After applying the method of distances between thr nearest neighbours the final solution shows the same characteristics of the two clusters. The data missing for some indicators of 5 countries (IR, CY, L, M, SL) conducted to allocation of the rest of 22 countries, as: 7 countries in first cluster (BE, G, S, I, NL, SW and UK) and 15 in the second cluster (BG, CZ, DK, ES, GR, F, LV, LT, HU, A, PL, P, RO, SK, FL). The two clusters are presented in Figure 1.

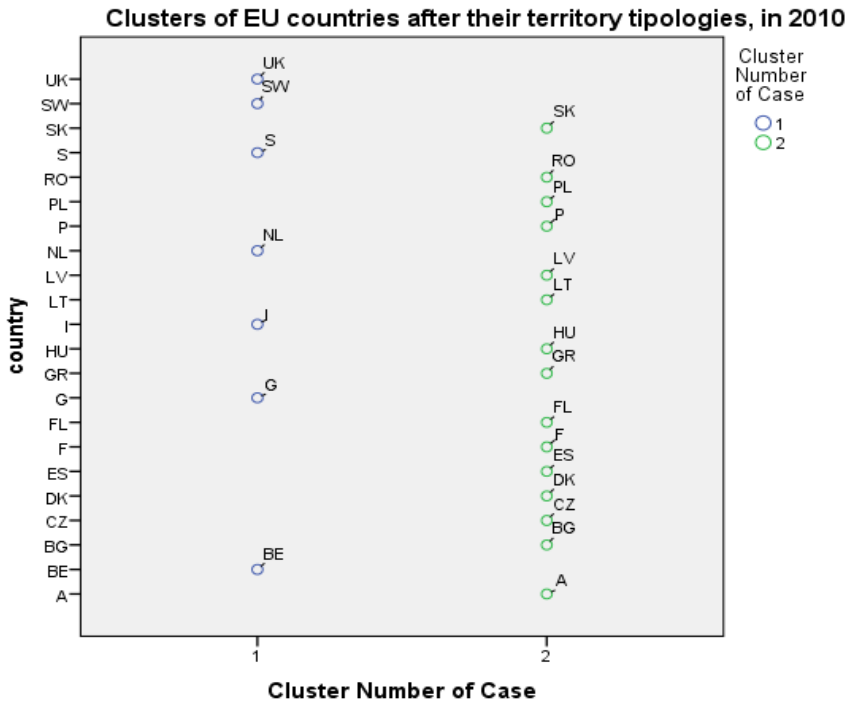

Fig. 1. *The two clusters of EU countries after %territory typology*

The first cluster has a higher amplitude of distance variation face to the second one. The 5 countries not considered by clustering method have either rural (IR), or urban (M) or intermediate regions (L, CY).

The chart from Figure 2 shows the %rural territory: Ireland (IR) has 100% rural territory, face to Netherlands (NL) which has a very low value of rural area. Romania is situated close to the median value, together with Slovenia and Slovakia.

The EU countries with 100% territory of intermediate regions are: Luxembourg (L) and Cyprus (CY). Romania is situated also on the median value of this percentage of intermediate regions.

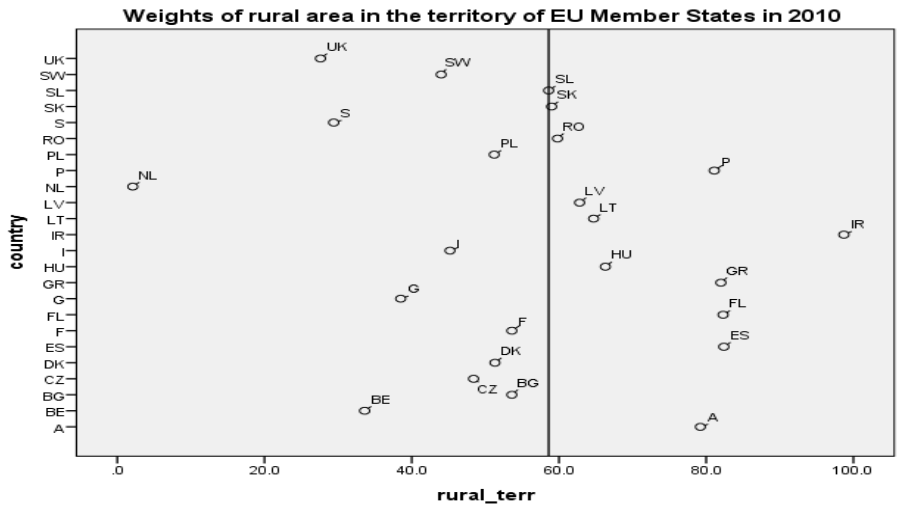

Fig. 2. *Position of EU countries after their %territory in rural regions*

Malta has 100% of territory in urban regions, followed by Netherlands with more than 40%, Belgium (BE), United Kingdom (UK).

4.6.2. Multivariate approach of regional profiles of EU States

Applying the Principal Components Analysis in SPSS, for all four indicators describing the *Importance of rural areas* context, there can be identified the two principal components defining the EU regional typology.

The first component is that of *urban-intermediate axis* having the urban variables at the right side and the intermediate ones at the left side. The second component is that of *rural axis* with the variables corresponding only to rural profile. In this way there is emphasized the importance of rural characteristics of EU regions. The variables defining the two components are presented in Figure 3, the so called circle of correlations between the variables and the principal components.

Both components explain 94% of the entire variation of countries, represented on the chart of individuals in Figure 4.

The group of countries placed close to the intersection of both axes has an average regional profile for both components. Most of the countries are placed in an interval, between plus and minus one standard deviation face to the averages of both axes. Luxembourg and Cyprus are more representative for intermediate profile, Malta has obviously an urban profile, Ireland has a rural profile.

The position of regional profiles can be analized in a dynamic way, in a long period of time, to check the shifting positions after implementing EU programs of rural development.

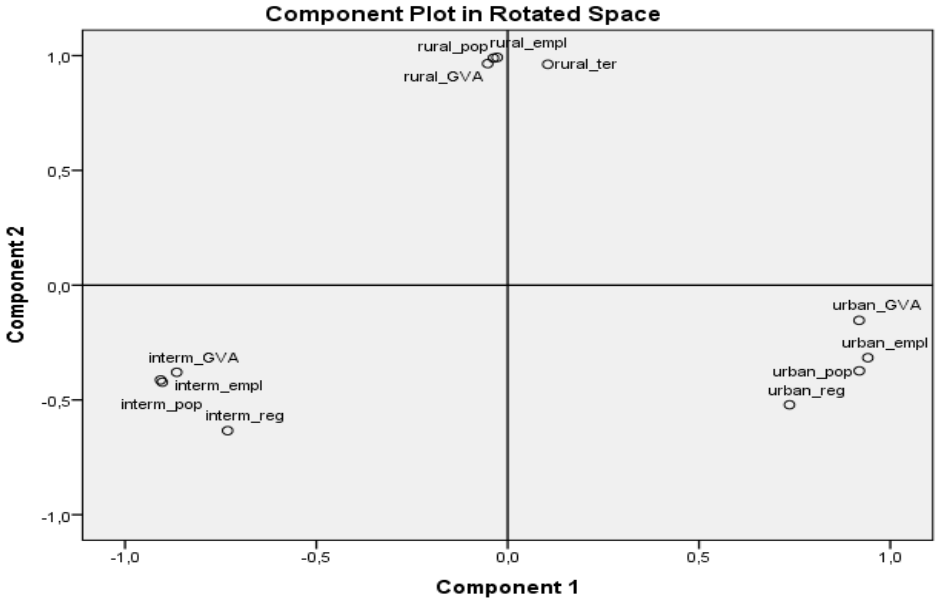

Fig. 3. *Circle of correlations of the principal components*

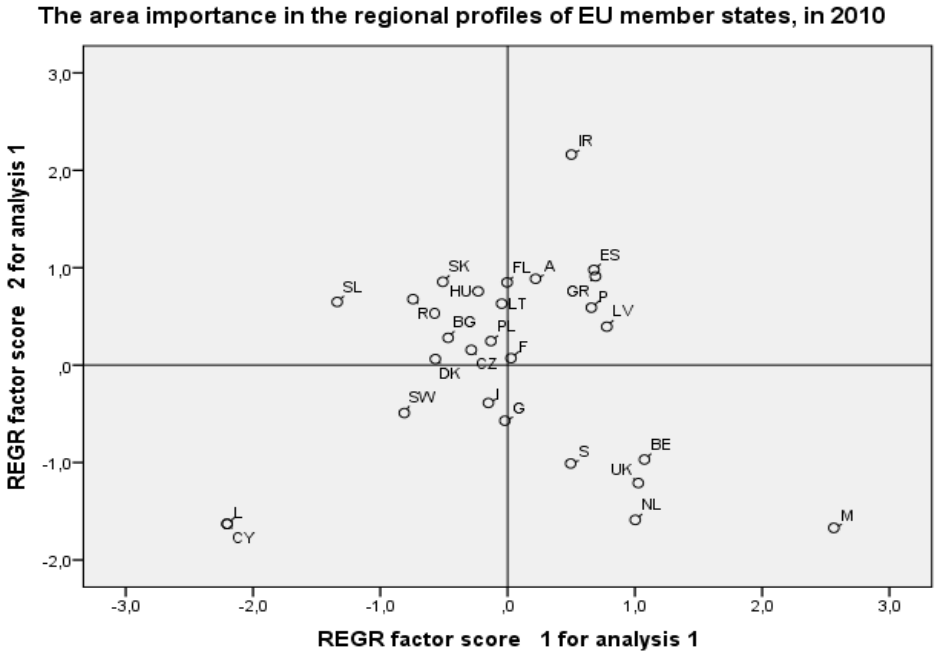

Fig. 4. *Position of EU countries after their regional profiles in 2010*

5. Conclusions

This study offers a description of the actual situation of regional profiles of EU Member States, showing the importance of considering the rural regions in the Europe 2020 strategy towards a regional and local dimension.

It emphasizes the idea of taking into account the EU regional profiles for the EU rural development and for implementation of agricultural policies. Also the allocation and programming of the European funds should envisage eliminating the disparities not only between urban and rural regions, but also between the EU Member States having different importance of rural area in the regional profiles.

The European Committee of the Regions had established in March 2014, at Athens summit, a territorial dimension for Europe 2020 strategy. In 2015, the principal themes for modernising Europe were: regions in the energy union and the single digital market, open regions for business and SME development, innovation and job creation, urban and rural development, urban-rural integration.

6. References

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