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ANALYSIS OF THE DEGREE OF RURALIZATION AT THE TERRITORIAL LEVEL

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Abstract: *This paper presents the main characteristics of the workforce in rural areas. The primary objective of the study is to highlight the importance of the workforce resource in the Romanian rural space, as a key element of sustainable development, given that 47.7% of the population resides in rural areas. The study aims to analyze the implication of the degree of ruralization at the territorial level for the 41 counties, on the workforce and the level of economic development. According to the conducted statistical-economic analysis at the national level, it is observed that in regions where the process of ruralization is pronounced, economic outcomes are less impressive, and this trend can largely be attributed to the lower average productivity level of the workers. Stimulating the development of rural areas in Romania is considered necessary, as is enhancing the quality of the workforce in the rural environment.*

Keywords: *ruralization, rural development, workforce, agriculture, correlation*

JEL Classification: Q01, O12, O15

INTRODUCTION

Rural regions adopt diverse developmental models to accommodate specific characteristics such as low population and economic activity density. This diversity underscores the need for a typology of different rural definitions, including: i) rural areas within functional urban zones; ii) rural areas adjacent to functional urban zones; and iii) rural areas situated far from functional urban zones, isolated (OECD Regional, 2016).

The demographic component plays a crucial role in rural development. The rural population acts as a dynamic element for rural communities and the local economy. Demographic factors influence rural development by shaping trends, contributing to spatial structure, affecting public and private services, determining economic vitality, and influencing cultural identity.

Exploring socio-economic and demographic aspects in rural areas constitutes a widely studied topic in scientific literature. However, a significant portion of research on this theme is connected to the progress of the agricultural sector (Popescu A., Condei R., 2015, Popescu A., Dinu T. A., Stoian E., 2018, Popovici (Barbulescu), A., 2012).

Rural regeneration is a crucial necessity for rural areas facing economic and demographic decline, urban migration, and deindustrialization. These challenges often result in limited opportunities for the youth and can lead to social and physical isolation of rural communities. Therefore, implementing rural regeneration strategies can play an essential role in improving the situation in these areas (Aisling M. 2020)

MATERIAL AND METHOD

To fulfill the main objective of the study, the following steps were undertaken:

- The first part of the paper presents an analysis of the territorial degree of ruralization at the national level, the evolution of the active and employed population by residency areas, as well as the trends

of key labor market indicators (activity rate and employment rate) in both urban and rural areas. To assess the quality of life, the indicator regarding the level of education was also analyzed.

- The second part of the study analyzed a set of variables characterizing territorial economic development and the labor force. The description of these variables can be found in Table No. 1. In order to study the intensity of the relationship between the proposed variables, statistical data were processed using the Correl function, resulting in the Pearson correlation coefficient. To carry out the proposed research, the statistical data processing was conducted for all 41 counties in Romania.

Table 1. Description of the technical indicators used in the study

Variables	Description	Period	Source
<i>Degree of Ruralization (%)</i>	The degree of ruralization represents the proportion of the rural population in the total population at the county level.	2021	National Institute of Statistics, Statistical Yearbook of Romania.
<i>Average gross earnings (thousands of lei).</i>	The average gross monthly earnings per capita, at the county level.	2021	National Institute of Statistics, Statistical Yearbook of Romania.
<i>Employees in agriculture (thousands of persons).</i>	The average number of employees in the agricultural sector includes individuals employed under fixed-term or indefinite contracts/agreements, at the county level.	2021	National Institute of Statistics, Statistical Yearbook of Romania.
<i>Unemployment rate (%).</i>	The registered unemployment rate represents the ratio between the number of unemployed individuals and the civilian labor force at the county level.	2021	National Institute of Statistics, Statistical Yearbook of Romania.
<i>GDP per capita (thousand lei per capita).</i>	The Gross Domestic Product (GDP) at the county level per capita.	2021	National Institute of Statistics, National Commission of Prognosis

The correlation coefficient is a numerical value that quantifies the level of relationship between two variables in a dataset (M. I. Aceleanu, 2012). This coefficient indicates to what extent changes in one variable are correlated with changes in another variable. The range of variation for the correlation coefficient is between -1 and 1 (Opariuc, 2009). The formula for calculating the correlation coefficient is as follows:

$$Correl(X, Y) = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sqrt{\sum (x - \bar{x})^2 \sum (y - \bar{y})^2}}$$

A correlation coefficient close to 1 or -1 suggests a stronger correlation, while a coefficient close to 0 indicates a weaker correlation. However, it's essential to understand that correlation doesn't always imply a causal relationship between variables. They might be correlated due to other factors or have a complex relationship (Petcu, N., 2003).

RESULTS AND DISCUSSION

According to statistics provided by Eurostat in the year 2021, approximately 21% of the European Union's population lived in rural areas, while 39% lived in small towns and suburbs, which act as transition zones between rural and urban spaces. Rural areas constituted about 83% of the total

land area of the European Union. Despite the significant coverage of rural areas, both the socio-economic development level and the challenges faced are not uniform across them (Eurostat, 2023).

In Romania, rural areas exhibit significant disparities compared to urban areas, influenced by their proximity to larger cities and the economic performance of the region. The differences between the two areas pertain to labor production, access to healthcare, education, and public utilities.

The national territory has a substantial share of rural zones, with a rural land area of 207,633 km², accounting for 87% of the total country's land area. In the year 2021, the resident population stood at 19.04 million people, with consistent declines over the past decade. The rural population accounted for 47%, making Romania one of the European countries with the highest rural population share, alongside Slovenia and Ireland.

In rural areas, as of the year 2021, there were 8.9 million resident individuals. Analyzing the territorial distribution of the rural population reveals that it is not evenly spread, showing regional differentiations.

Counties with a high degree of ruralization in the year 2021 were Dâmbovița with 72.7%, Giurgiu with 71.2%, Teleorman with 67.5%, Neamț with 64.71%, and Călărași with 63.92%. On the other end of the spectrum are counties like Hunedoara (26.3%), Brașov (30.18%), Constanța (33.02%), and Cluj (35.45%) (Figure 1).



Figure 1. Territorial Degree of Ruralization, 2021 (%)

Source: Data from INSSE, as of June 20, 2023

The human factor as well as labor are essential for economic and social progress; labor market theories and models directly contribute to economic growth. To analyze the labor market in Romania, it's crucial to consider that it's influenced by various factors: economic, institutional, social, and demographic, leading to two significant outcomes. The labor market presents national-specific traits, and its functioning is influenced not only by the variation in aggregate labor demand and supply but also by regulations, the national economic structure, and the education and vocational training system. The second consequence relates to technical and technological changes, which have different effects on employment and qualification structures, depending on local and regional conditions.

Assessing the overall state of labor force participation involves analyzing key statistical indicators that can measure the labor market: the active population, the employed population, the number of unemployed individuals, and the number of employees. These mentioned indicators provide crucial insights into the dynamics and characteristics of the labor market in Romania.

The proportion of the employed population at the national level represented 94.4% of the total active population in the year 2022, with the difference accounting for the category of unemployed individuals.

In Figure 2, the evolution of the active and employed population in urban and rural areas can be observed. Both the trend of the active and employed population in these two residency areas show a decrease during the period 2010-2022. The active population in both urban and rural areas decreased in 2022 compared to 2010 by 5.4% and 19.1%, respectively. Regarding the employed population, it followed a similar trend, with a sharp decrease in 2021 compared to 2020. In the rural areas, the employed population decreased by 16.9%. These reductions in the employed population can be attributed to various factors such as rural-to-urban migration in search of more varied and better-paid job opportunities, modernization of agriculture, inadequate infrastructure making rural areas less attractive for residence and employment, limited access to education, and quality.

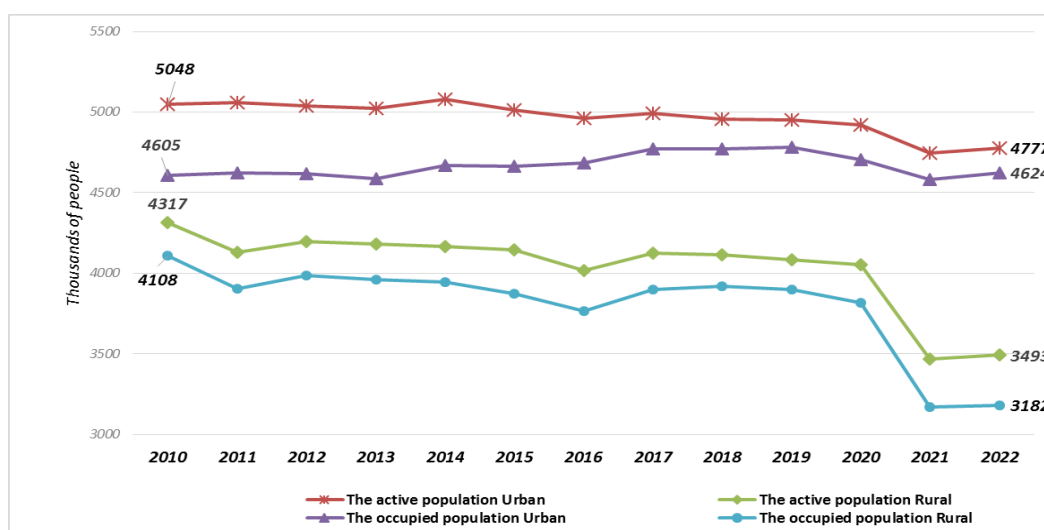


Figure 2. Evolution of Active and Employed Population by Residency Areas

Source: Data from INSSE, as of June 20, 2023

Analyzing the employed population by type of occupation reveals intriguing conclusions. At the end of the analysis period, a significant increase in the proportion of employees in the agricultural sector is notable, while the number of self-employed workers decreased by 46%. Additionally, there is a considerable decrease of 73% in unpaid family workers (INSSE Data).

From the perspective of the nature of the activity carried out by the employed population, Romania demonstrates a higher level of engagement in the primary sector (agriculture, forestry, and fishing), with a rate of 9.81% in the year 2021. It's important to highlight that its trend has been decreasing, reducing by 70%, from 2.5 million people in 2010 to 763 thousand people in 2021 (INSSE Data).

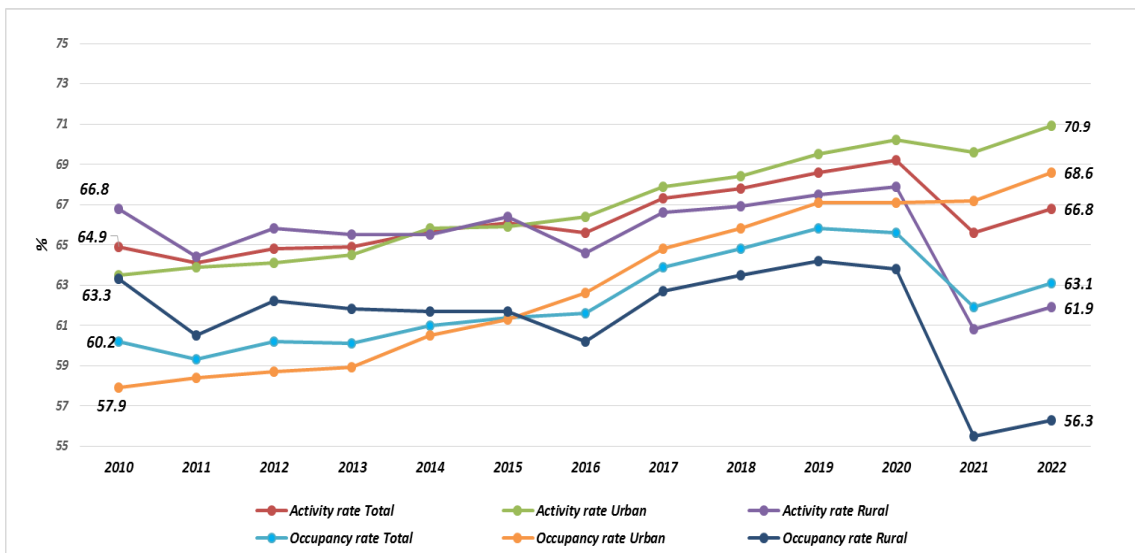


Figure 3. Evolution of Activity and Employment Rates by Residency Areas (%)

Source: Data from INSSE, as of June 20, 2023

In the year 2021, the employed population in the Agriculture, Forestry, and Fishing sector in rural areas accounted for the dominant proportion, namely 89% of the total, while in urban areas, it represented only 11%. Analyzing the derived labor market indicators, it's evident that during the period of 2010-2022, the figures reflecting the labor market condition in urban areas, namely the activity rate in this zone, exhibited a consistent upward trend compared to the national and rural levels.

In rural areas, both the activity rate and the employment rate showed oscillatory trends, with a sharp decline in 2021 compared to 2020.

Due to demographic aging in rural areas and the attractiveness of urban labor markets, both rates followed a downward trajectory.

In rural regions, there can often be a situation where unemployment or underemployment is not immediately visible, especially in areas with lower economic levels.

This situation arises when there are no alternative employment options, and one possibility is to work on the family farm with low productivity. This is especially true when the agricultural sector is substantial, and there's a significant presence of self-employment on farms or in traditional services, often of small scale. The effect of these aspects is that the number of employed individuals in rural areas of Romania is overestimated (Herman E., 2012.).

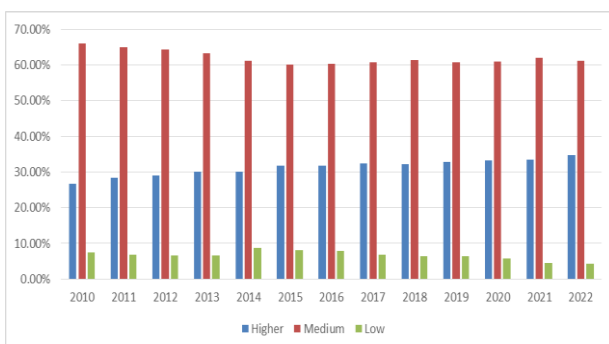


Figure 4. Education Level of the Employed Population in Urban Areas

Source: Data processed by INSSE, as of June 20, 2023



Figure 5. Education Level of the Employed Population in Rural Areas

Source: Data processed by INSSE, as of June 20, 2023

In assessing the quality of life, both at the individual and societal levels, a series of indicators are used, including those related to education and employment, due to the close link between education, employment, and the standard of living.

In the labor market of Romania, significant differences in terms of education level are evident. Figures 4 and 5 present information about the proportion of the employed population at different education levels in urban and rural areas, highlighting substantial disparities between the two settings. In rural areas, there is a predominance of the employed population with medium and low levels of education, while in urban areas, about 35% of the employed population has a higher education level and over 60% have a medium education level. A high level of education enhances labor market participation and provides individuals with the opportunity to earn higher incomes (Aceleanu, 2012).

Higher education plays a crucial role in ensuring that the number of graduates matches the demand for jobs in the country's economy and meets the requirements imposed by international competition (Popovici (Barbulescu), A., 2012)

Performance related to territorial economic development is evident in counties with a high degree of urbanization, showcasing a direct link between socio-economic development and urbanization. Conversely, a totally opposite relationship is highlighted between socio-economic development and the degree of ruralization.

Table 2. Results

		Correlations					
		degree_rural	salary_earnings	agric_employees	unemployment_rate	GDP	employees_total
degree_ruralization	Pearson Correlation	1	-.421**	.395*	.394*	-.528**	-.567**
	Sig. (2-tailed)		.006	.011	.011	.000	.000
	N	41	41	41	41	41	41
salary_earnings	Pearson Correlation	-.421**	1	-.437**	-.505**	.646**	.821**
	Sig. (2-tailed)	.006		.004	.001	.000	.000
	N	41	41	41	41	41	41
unemployment_rate	Pearson Correlation	.394*	-.505**	.420**	1	-.573**	-.558**
	Sig. (2-tailed)	.011	.001	.006		.000	.000
	N	41	41	41	41	41	41
GDP	Pearson Correlation	-.528**	.646**	-.463**	-.573**	1	.682**
	Sig. (2-tailed)	.000	.000	.002	.000		.000
	N	41	41	41	41	41	41
employees_total	Pearson Correlation	-.567**	.821**	-.633**	-.558**	.682**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	41	41	41	41	41	41
agricultural_employees (%)	Pearson Correlation	.395*	-.437**	1	.420**	-.463**	-.633**
	Sig. (2-tailed)	.011	.004		.006	.002	.000
	N	41	41	41	41	41	41

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Source: data processing by the author, SPSS

The statistical data analyzed at the territorial level reveals that in counties with a higher degree of ruralization, the level of economic development is lower. The most economically developed

counties with low ruralization rates are Cluj, Satu-Mare, Timiș, and Brașov, with GDP values per capita of 87.01 thousand lei, 79.6 thousand lei, 77.7 thousand lei, and 72.5 thousand lei, respectively. Counties with a higher degree of ruralization are situated in underdeveloped areas with a GDP below 40 thousand lei per capita, such as Vaslui, Giurgiu, Teleorman, and Botoșani. The analysis resulted in a strong negative correlation between the variables of ruralization degree and economic development level (GDP), with a Pearson correlation coefficient of -0.528.

Similarly, in the case of the relationship between the ruralization degree and the average wage, it can be observed that the values are inversely proportional. The correlation is of medium intensity, yet negative, with a Pearson correlation coefficient of -0.421. The wage situation is an important factor characterizing the level of territorial development, also serving as a strong incentive for population migration and financial comfort. Counties with high wage values are Cluj, Timiș, and Brașov, with wages exceeding 6,000 lei, while the lowest values are in Vrancea, Covasna, and Vâlcea, slightly above 4,300 lei.

A direct and positive correlation is found between the degree of ruralization and the unemployment rate, with both variables varying in the same direction. The correlation coefficient of 0.394 indicates a medium level of intensity between the two variables. This suggests that counties with high ruralization values also have high unemployment rates. Among these are Vaslui, Teleorman, Mehedinți, and Dolj, with unemployment rates ranging from 8.6% to 6.8%. On the other hand, counties like Ilfov, Cluj, and Timiș have rates ranging between 0.4% and 1.3%.

Considering labor resources and economic sectors, it becomes evident that these can be key indicators in the development of rural areas.

Analyzing the relationship between the degree of ruralization and the employed population, it can be observed that the intensity of the connection is moderate and negative, resulting in a Pearson correlation coefficient of -0.567. This highlights that in counties with a higher number of employees, the degree of ruralization is lower. However, if we examine the degree of ruralization at the territorial level and the employment in the agricultural sector, a moderate positive correlation is evident, as indicated by the Pearson correlation coefficient of 0.395. As the degree of territorial ruralization increases, the workforce in the agricultural sector also increases, given that it is the primary sector of activity.

From a statistical perspective, a negative relationship between agricultural labor (employees in agriculture) and the characteristic economic development indicator (GDP) can be identified, with a Pearson correlation coefficient of -0.463. Therefore, in counties where the number of employees in agriculture is higher, the recorded GDP is lower. This indicates that counties with higher GDP are economically and industrially developed.

In summary, the analysis reveals complex interdependencies between ruralization, employment, economic development, and sectoral dynamics, which together contribute to shaping the socio-economic landscape of the analyzed regions.

CONCLUSIONS

Although the urban areas have significantly higher rates of employment and activity compared to rural areas, and the unemployment rate is lower, statistical and economic analysis based on national-level data shows that issues related to employment in rural Romania are still unresolved.

In order for employment in rural areas to have a significant impact on improving the residents' quality of life, it is imperative to develop and implement employment policies that stimulate

increased employment in non-agricultural sectors within rural communities, ensuring income stability and optimizing work processes in these areas. Thus, the improvement of employment quality in rural areas is considered necessary.

To enhance the standard of living in rural regions and promote economic development, it is essential to develop employment policies that support increased employment in non-agricultural sectors, guarantee stable incomes, and optimize working conditions. The challenges of low education levels and specialization in sectors with low added value must also be addressed.

Furthermore, a negative correlation between the degree of ruralization and economic development is evident, suggesting that regions with a higher degree of ruralization tend to exhibit modest economic performance. This could be influenced by multiple factors, including the lower productivity of the workforce, lower education levels, high unemployment rates, and the presence of elderly individuals.

In conclusion, overcoming the challenges of rural employment requires a holistic approach that encompasses investments in education, the development of high-value-added economic sectors in rural areas, and the implementation of employment-stimulating policies alongside improved working conditions. This approach will contribute to promoting sustainable and equitable development in rural Romania.

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