EVOLUTION OF POPULATION AND GROSS DOMESTIC PRODUCT IN THE SOUTH-WEST OLTENIA REGION, ROMANIA, IN THE PERIOD 2020-2023

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Abstract

The purpose of the paper was to study the dynamics of the population as a whole and by urban and rural area and of Gross Domestic Product (GDP) for a better understanding of the long-term sustainability of regional development, given that in a globalized economy, labor mobility and capital flows are dynamic, and regions that do not effectively manage the interdependencies between GDP and population risk losing competitiveness. The importance of the subject is given by the fact that these two variables can serve for strategic planning and sustainable development in the future. The study is based on the data provided by the National Institute of Statistics for the period 2020-2023 which were processed in their dynamics reflecting the growth rate in the whole period. Important comments were made on the population and GDP evolution both at the level of the South West Oltenia region, and in the urban and rural area. The South West Oltenia region is located in the South of Romania, and includes the Dolj, Gorj, Mehedinți, Olt and Vâlcea counties. It plays an important economic role. Its activity is based on agriculture and industries such as energy, but it faces economic challenges, with a GDP per capita below the national average and an infrastructure in need of modernization. The region is experiencing depopulation and an aging population, which affects its economic development. During the analyzed period, a general trend of the population decline was observed in the region, attributed to the overall decrease in both urban and rural zones, with Dolj county being the most impacted. While the rural population experienced a slight decline across the region, Gorj and Dolj counties demonstrated signs of stability or even growth, whereas Mehedinți, Olt, and Vâlcea counties experienced a sharper drop. Despite this, the South-West Oltenia Region continued its economic growth between 2020 and 2023, indicating an expanding regional economy driven by various industries, trade, and specialized services.

Key words: *population, GDP, economic development, South-West Oltenia Region*

INTRODUCTION

Studying the interdependence between GDP and population in the development regions of Romania is important for understanding the economic and social dynamics at the regional level [2, 4].

GDP, as an indicator of economic performance, represents a region's capacity to generate economic value and is strongly influenced by demographic factors, including population size and structure [3, 9]. A growing population may indicate increased potential for economic growth due to an expanding labor force and domestic consumption, but on the other hand, a declining population may signal structural problems such as migration or demographic aging that could undermine economic sustainability in the long term.

Examining these relationships is vital for crafting effective public policies, as demographic factors shape the demand for goods and services, which subsequently affects economic production and investment in the region [5, 11]. In regions where the population is declining or aging, there is a risk that GDP will be negatively affected, which can lead to a vicious circle of underdevelopment and depopulation [16, 13]. Understanding these trends allows decision makers to take proactive measures to stimulate the economy, such as attracting investment, improving infrastructure or implementing policies to support demographic growth [14]. Also, the study of

these relationships offers a perspective on regional disparities in Romania, given that some regions have registered significant economic growth, while others lag behind, affected by economic stagnation and demographic decline [11, 18]. Analyzing these phenomena can reveal the need for more targeted interventions to address disparities and promote equitable development nationwide, as reducing these inequalities is a key goal for achieving balanced and sustainable national growth [8]. Considering the fact that disparities are manifested by significant differences in terms of the level of economic development, access to resources and services, infrastructure and employment opportunities between different regions of a country, the ways to reduce these disparities are multiple and include interventions both at the level of public policies, as well as at the level of private initiatives.

One of the main ways to reduce regional disparities is investment in infrastructure. The development of transport, communication and energy infrastructure is crucial for connecting underdeveloped regions with national and international markets. Adequate infrastructure can facilitate access to resources and markets, attracting investment and creating jobs [15]. Also, the development of social infrastructure, such as schools and hospitals, is essential to improve the quality of life and to attract and retain the population in less developed regions. Another important aspect is the regional cohesion policy promoted at national and European level, which aims to allocate funds and resources to less developed regions to reduce economic and social gaps. European structural and investment funds, for example, have a significant role in financing infrastructure, innovation and social inclusion projects in regions that need additional support. Reducing regional disparities is important not only from the perspective of social equity, but also for ensuring sustainable economic development at the national level. Underdeveloped regions may contribute to internal migration, depopulation, and social instability. Conversely, addressing disparities can result in a fairer distribution of resources, a more cohesive national market, and more

balanced economic growth that benefits the whole country. Regarding South West Oltenia region, the literature reflects that there are authors who studied the dynamics of the population as a whole, and by urban and rural area in various periods [1, 6, 7]. Other authors showed the evolution of GDP in the South West Oltenia region [17].

In this context, the purpose of this study is to investigate the evolution of the population and GDP in the South West Oltenia region during the period 2020-2023 in order to identify the main trends and to enable authorities to set up a future forecast of the demographic and economic development in this part of Romania.

MATERIALS AND METHODS

The research methodology involved the use of descriptive analysis, along with the calculation and interpretation of indicators related to the population and GDP value in the South West Oltenia Region for the period 2020-2023. Descriptive analysis is a useful tool for any statistical research process, providing a solid basis for understanding the data and for carrying out more complex subsequent analyses, simplifying the data and making the interpretation more accessible for further investigations. Also, the time series analysis involved the examination of data from the period 2020-2023 in order to identify trends, seasonality and cyclical fluctuations.

To understand the rate of change, we calculated the annual growth rates of GDP and population by comparing consecutive annual values and expressing the percentage change, which were the basis for calculating the annual growth rate.

Graphical representation was also employed to visualize the evolution of the analyzed indicators, namely GDP and population. This method, though simple, proved highly effective in clearly identifying trends and significant changes over time, providing a comprehensive view of their progression.

RESULTS AND DISCUSSIONS

The South-West Oltenia region, located in the south of Romania, consists of Dolj, Gorj,

Mehedinți, Olt and Vâlcea counties, being characterized by a significant geographical diversity, including both fertile plains in the south and mountainous areas in the north, dominated by Southern Carpathians.

The economy is predominantly agrarian, but also has important industrial sectors, such as energy, contributing significantly to national energy production. However, the region faces economic challenges, with a lower GDP per capita level compared to the national average, and an infrastructure in need of modernization.

Demographically, the region is characterized by a trend of depopulation and aging of the population, a common phenomenon in many rural regions in Romania. This influences economic development and requires the implementation of policies that attract investment and stimulate sustainable development.

Understanding the population dynamics of a region is vital for predicting the economic, social, and demographic changes that shape its development.
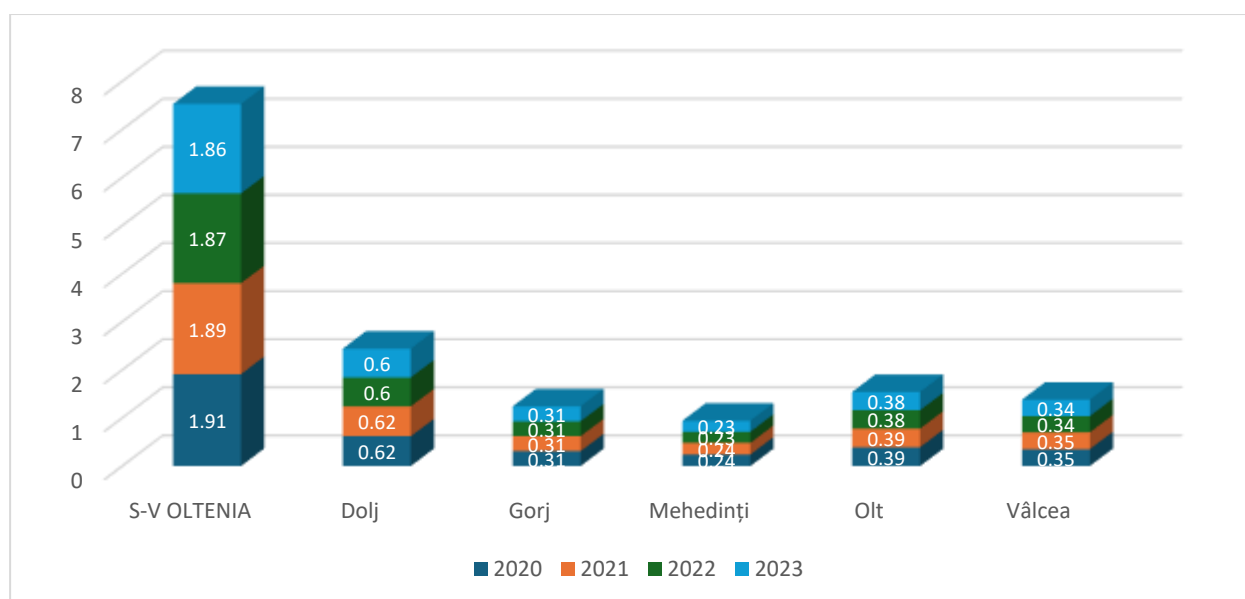

Fig. 1. Evolution of the population in Reginea Sud West Oltenia in the period 2020-2023
(millions of inhabitants)
Source: INSSE, own processing [12].

The total population of the South West Oltenia region decreased from 1.91 million in 2020 to 1.86 million in 2023, which represents a reduction of 2.61% over these years. This decline is reflected in every county in the region, although the rate of decline varies. Thus in Dolj county, the population decreased from 0.62 million in 2020 to 0.60 million in 2023, registering a decrease of 3.22%, this being one of the smallest percentage decreases in the region, thus indicating relative stability higher compared to other counties. In Gorj county, the population remained constant during the analyzed period. In Mehedinți county, the largest percentage decrease of the population was recorded, of 4.16%, from 0.24 million in 2020 to 0.23 million in 2023, which indicates a sharp demographic decline, which

can be attributed to migration or the rate low birth rate.

In Olt county, the population decreased from 0.39 million in 2020 to 0.38 million in 2023, a decrease of 2.56%, which indicates a similar trend to that in Mehedinți. In Vâlcea county, the population decreased from 0.35 million in 2020 to 0.34 million in 2023, registering a decrease of 2.85%, relatively moderate compared to other counties. Overall, the population decline in the Southwest Oltenia region reflects a general trend of demographic decline, which is caused by factors such as external migration, population aging and declining birth rates, which lead to negative implications on the regional economy, reducing the available labor force and affecting

the potential for long-term economic development.

Examining the relationship between urban and rural populations within a development region is crucial for understanding socio-economic dynamics and developing effective policies. This analysis allows the identification of internal migration trends, providing information on population mobility and the causes that determine the transition from rural to urban or vice versa. At the same time, the balance or imbalance between urban and rural populations directly influences resource allocation and infrastructure development, as the different needs and priorities of these communities must be addressed accordingly. In addition, analyzing this relationship helps to understand the impact of regional development policies, highlighting areas that require interventions to balance development between rural and urban, thus ensuring sustainable economic growth and increased social cohesion, which is essential for reducing economic disparities and for the promotion of harmonious development throughout the region.
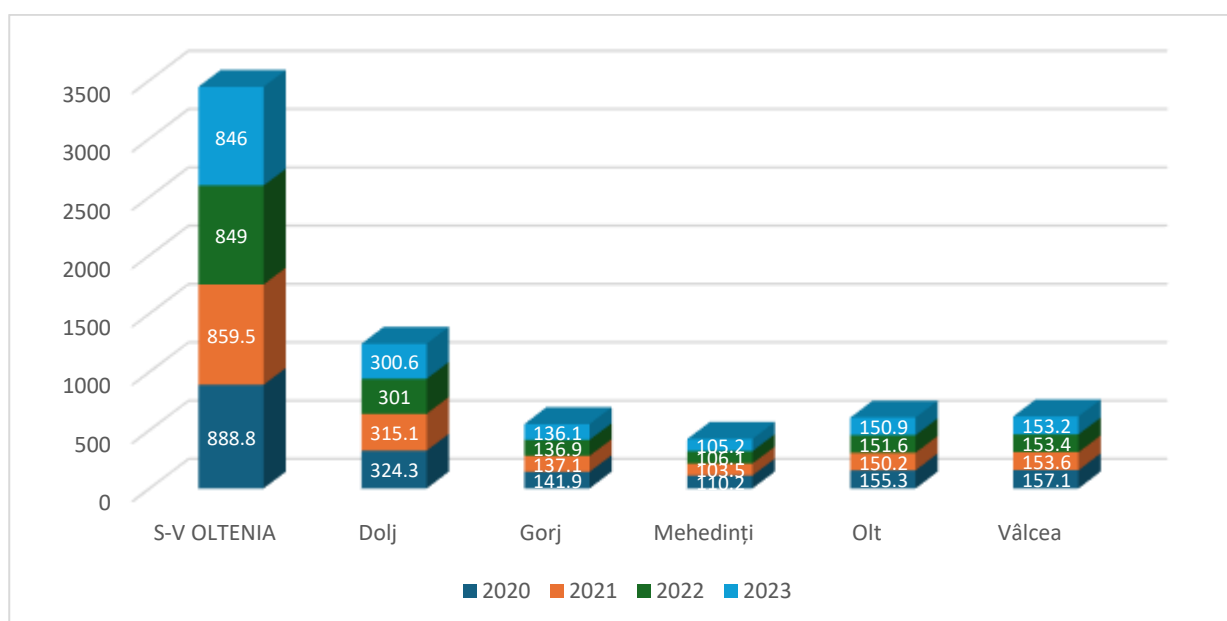

Fig. 2. Evolution of the urban population in Reginea Sud West Oltenia, in the period 2020-2023 (thousands of inhabitants)
Source: INSSE, own processing [12].

Analyzing the data regarding the urban population, we find a general tendency of its decrease in all the counties of the region, with variations in the intensity of this decline. Thus, for the South West Oltenia Region, the total urban population decreased from 888.8 thousand inhabitants in 2020 to 846 thousand in 2023, which represents a decrease of 4.81%. This decline reflects both urban migration and the drop in the birth rate, as common phenomena in many regions of Romania.

In Dolj county, the urban population decreased significantly, from 324.3 thousand in 2020 to 300.6 thousand in 2023, marking a reduction of 7.3%, being the biggest decline among the counties in the region, which has a economic and social impact. In Gorj county, the urban population decreased moderately, from 141.9 thousand in 2020 to 136.1 thousand in 2023, which represents a reduction of 4.08%. In Mehedinți county, the urban population decreased from 110.2 thousand in 2020 to 105.2 thousand in 2023, registering a decrease of 4.53%. Although relatively stable in 2022, the overall decline is comparable to that in Gorj County. In Olt County, the decrease in the urban population is moderate, from 155.3 thousand in 2020 to 150.9 thousand in 2023, with a reduction of 2.78%. Vâlcea County had an urban population that decreased slightly, from 157.1 thousand in 2020 to 153.2 thousand in 2023, marking a reduction of 2.48%, being the smallest percentage decrease in the region, which shows a relative stability.

From the analysis of the data on the rural population of the South West Oltenia Region, it was found that it decreased slightly from 1,022.6 thousand inhabitants in 2020 to 1,015.7 thousand inhabitants in 2023, marking a reduction of 0.67%. Thus, we find a relative stability of the rural population, compared to the urban population. The rural population of Dolj county increased slightly, from 297.9 thousand inhabitants in 2020 to 299 thousand inhabitants in 2023, representing an increase of 0.36%. In Gorj county, the rural population increased from 170.1 thousand inhabitants in 2020 to 175.2 thousand inhabitants in 2023, which represents an increase of 0.99%, this being the highest percentage increase in the region, indicating a revival of the rural

environment in this county. The rural population of Mehedinti County decreased from 128.6 thousand inhabitants in 2020 to 126.2 thousand inhabitants in 2023, registering a reduction of 1.86%. In Olt county, the decrease was more pronounced, from 234.6 thousand inhabitants in 2020 to 227.6 thousand inhabitants in 2023, with a reduction of 2.98%, indicating demographic problems of the rural environment due to migration to urban areas, to other regions of the country, but especially outside Romania. In Vâlcea county, the rural population decreased from 191.4 thousand inhabitants in 2020 to 187.7 thousand inhabitants in 2023, which represents a reduction of 1.93%.
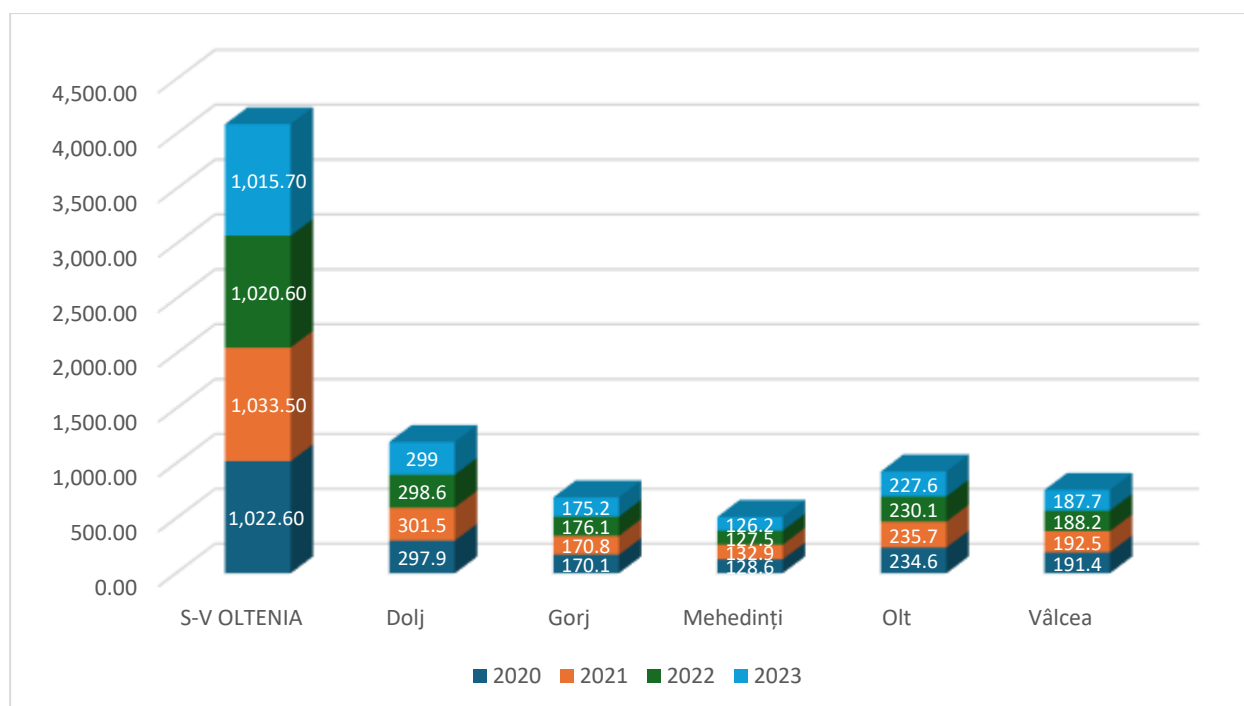

Fig. 3. The evolution of the rural population in the South West Oltenia Region, in the period 2020-2023 (millions of inhabitants)
Source: INSSE, own processing [12].

To comprehend the impact of demographic decline on the South-West Oltenia region, we extended the analysis to examine the structure of the regional economy. Population dynamics directly influence economic performance, resource allocation, and the region's capacity for sustainable development. The structure of the economy determines the types of jobs available, the level of wages, opportunities for training and professional development, all of which directly influence the attraction, retention or loss of population in the region. The size and structure of the population influences the demand for various goods and services, thus shaping the economic structure of the region.

A growing population can spur expansion of the construction, education, and health sectors, while a declining population can lead to

reduced demand and stagnation in certain economic sectors.

The role of this relationship is essential in regional strategic planning, because understanding the interactions between the economy and the population allows the development of policies that stimulate sustainable economic growth and ensure social cohesion. An economic structure well adapted to the needs and characteristics of the local population can generate prosperity, reduce regional disparities and create an attractive environment for investment and residents alike.

In this sense, it was analyzed the GDP value for the period 2020-2023, with the mention that the values for the years 2022 and 2023 are the estimated values, considering the lack of published data.

Table 1. GDP evolution at current prices in the South-West Oltenia Region, in the period 2020-2023 (millions Lei)

Specification	2020	2021	2022	2023	2023/ 2020 (%)
Agriculture, forestry and fishing	5,541.40	6,570.60	6,900	7,200	129.93
Extractive industry; manufacturing industry; production and supply of electrical and thermal energy	20,157.80	22,613.70	24,500	26,000	128.98
Construction	6,018.10	6,199.00	6,500	6,800	112.99
Wholesale and retail trade	14,292.90	17,026.30	18,250	19,250	134.68
Information and communications	1,469.00	1,354.60	1,450	1,500	102.11
Financial intermediation and insurance	974.5	1,065.70	1,125	1,175	120.57
Real estate transactions	5,970.80	6,141.80	6,400	6,700	112.21
Professional, scientific and technical activities	3,049.90	3,525.60	3,800	4,000	131.15
Public administration and defense; social insurance from the public system	14,458.10	14,201.40	14,100	14,100	97.52
Performance, cultural and recreational activities	1,531.00	1,734.40	1,800	1,850	120.84
Regional gross added value (VABR)	73,463.50	80,433.10	83,000	85,500	116.38
Product taxes	7,599.90	8,613.80	9,100	9,400	123.69
Duties on imports (customs duties)	156.5	240.3	270	290	185.30
Subsidies per product	-221.8	-244.3	-255	-265	119.48
Regional gross domestic product (GDP) - total	**80,998.10**	**89,042.90**	**92,000**	**95,000**	**117.29**

Source: INSSE, own processing [12].
Note: Exchange rate according to the National Bank of Romania, 1 Euro = 4.9744, October 2nd, 2024.

The data on the evolution of the gross domestic product highlight the fact that the agriculture, forestry and fishing sector had an increase of 29.93% between 2020 and 2023, representing a significant consolidation of the activity, due to several factors, including the modernization of agricultural technologies and the increase in productivity. Regarding the extractive and processing Industry sector, energy production and supply, it had an increase of 28.98%, due to the increase in demand and production in the industrial field, as well as the investments made in energy production capacities. The construction sector expansion of construction activities, driven by infrastructure projects, but also by the increase in housing demand. Wholesale and retail trade had one of the largest increases, of 34.68%, due to an intensified commercial activity, in the conditions of the increase in domestic consumption and the expansion of retail networks, a situation found throughout the country. Although the Information and communications sector had a growth of only 2.11%, it demonstrates the fact that the market has reached a maturity but continues to evolve. With a growth of 20.57%, the Financial Intermediation and Insurance sector reflects an improvement in financial and insurance services due to the increasing complexity of the regional economy and the need for such services. The real estate sector grew by 12.21%, due to the constant demand for properties, both in urban and rural areas. The Professional, Scientific and Technical Activities sector had an increase of 31.15%,

which indicates an increased demand for professional and technical services, due to an economy that is increasingly complex and oriented towards specialized services. The only sector that decreased was that of Public Administration and Defense; social insurance, the decrease being 2.48% and which was due to the reduction and efficiency of public expenses. In the performance, cultural and reactive activities sector, the 20.84% increase was due to the revitalization of this sector, on the one hand due to the relaxation of pandemic restrictions, and on the other hand to the increase in the population's income and interest in cultural activities.

Therefore, the regional gross value added (VABR) increased by 16.38% against the background of recording the general improvement in the economic performance of all sectors that contributed positively. The intensification of the general economic activity, but also the change in the method of taxation, led to a greater contribution to the tax revenues from commercial activities, contributing to a 23.69% increase in taxes on products. Also, the digitization and improvement measures of the collection activity, against the background of the internal fiscal reforms, but also those of alignment with the European legislation, had a direct impact on this sector.

The data published by INSSE highlight a significant increase in customs duties, which is 85.30% and which was due to both the increase in import activities and the integration of the regional economy more and more into international trade. We also noted a 19.48% increase in subsidies that was due to government support granted for certain products or sectors.

The increase in GDP was 17.29%, reflecting a global improvement in the regional economy, given that all sectors contributed to this economic growth, despite the challenges and declines in certain areas.

CONCLUSIONS

The analysis of the relationship between population evolution and GDP in the South-West Oltenia region highlighted several important aspects for understanding the regional economic and social dynamics. First, the increase in GDP, observed in most economic sectors between 2020 and 2023, shows that the region has managed to diversify and strengthen the economy, which can be a determining factor in counteracting the negative effects of demographic decline. Secondly, the stability or even the growth of the population in certain counties contributed to the maintenance of internal demand, essential for supporting trade and the construction industry, sectors that have important records in the analyzed period.

On the other hand, sectors such as Public Administration and Defense recorded decreases, which was due on the one hand to improvements in public spending, and on the other hand to the decrease in the population and, implicitly, the need for public services. This aspect underlines the importance of a stable and active population to sustain a sustainable economic activity.

At the same time, the expansion of the professional, scientific, and technical sectors reflects an evolving economy that requires skilled labor. However, population decline is a factor that puts pressure on these sectors, affecting their ability to grow and innovate. Moreover, the significant growth in the agricultural and industrial sectors demonstrates that despite the falling population, the region has managed to increase productivity, which underlines the importance of technological investments and infrastructure upgrades.

The analysis shows once again the fact that, to support and amplify economic growth, regional policies need to simultaneously address the problem of demographic decline and promote measures to attract and maintain the active population, essential for the economic future of the region.

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