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ORGANIC FOOD PRODUCTION AS A FACTOR OF MACROECONOMIC DEVELOPMENT IN RURAL AREAS OF SERBIA: IMPACT ON GDP, EMPLOYMENT AND SUSTAINABLE GROWTH

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Abstract: This paper examines the role of organic food production as a significant factor of macroeconomic development in rural areas of Serbia, with a particular focus on its impact on gross domestic product, employment, and overall rural development. In the context of increasing global demand for sustainable agricultural practices and environmentally friendly production systems, organic agriculture has emerged as a strategic sector capable of generating both economic and social benefits. The primary objective of this research is to analyze the extent to which organic food production contributes to macroeconomic indicators and to evaluate its potential as a driver of balanced regional development. The study is based on a combination of quantitative and qualitative research methods, including analysis of secondary statistical data, comparative analysis of macroeconomic trends, and examination of policy instruments supporting organic agriculture, particularly within the framework of the IPARD III program. Special attention is given to the alignment of organic production with the United Nations Sustainable Development Goals, especially those related to zero hunger, decent work and economic growth, and life on land. The results indicate that organic agriculture has a positive and growing contribution to rural employment, particularly through small and medium-sized enterprises and family farms, while also enhancing value-added production and export potential. Furthermore, the development of organic production contributes to the diversification of rural economies, reduces regional disparities, and strengthens environmental sustainability through the preservation of biodiversity and soil quality. However, the findings also reveal structural challenges, including limited institutional support, insufficient access to financing, and a lack of education and technological advancement among producers. The discussion highlights the importance of targeted policy measures, financial incentives, and capacity-building initiatives in order to fully exploit the macroeconomic potential of organic agriculture. The paper concludes that organic food production represents a viable and sustainable development pathway for rural areas in Serbia, with significant implications for economic growth, employment generation, and long-term ecological stability, provided that systemic support mechanisms are effectively implemented and aligned with international development frameworks.

Keywords: *Organic agriculture, rural development, GDP, employment, Serbia, sustainable development.*
Field: Social Sciences

1. INTRODUCTION

In recent decades, the concept of sustainable development has become a central paradigm in economic policy and academic discourse, particularly in the context of rural development and agricultural transformation (Janković et al., 2025b). Traditional agricultural models, primarily focused on maximizing productivity and short-term economic gains, have increasingly been challenged due to their negative environmental impacts, resource depletion, and limited contribution to long-term socio-economic stability. In this context, organic food production has emerged as a viable alternative that integrates economic efficiency, environmental protection, and social responsibility (Janković et al., 2025a) . As such, it represents a key component of contemporary strategies aimed at achieving balanced and inclusive development, especially in rural areas.

The importance of organic agriculture is further emphasized by its alignment with the United Nations Sustainable Development Goals, particularly SDG 2 (Zero Hunger), SDG 8 (Decent Work and Economic Growth), and SDG 15 (Life on Land). Organic production contributes to food security by promoting healthier and safer food systems, while simultaneously supporting sustainable land use practices and biodiversity conservation. Moreover, by generating employment opportunities and fostering small-scale entrepreneurship, organic agriculture directly contributes to economic growth and social inclusion in rural regions. These aspects position organic food production as not only an agricultural practice but also a broader development mechanism with significant macroeconomic implications.

In the case of Serbia, rural areas represent a substantial portion of the national territory and population, yet they are often characterized by structural weaknesses, including depopulation, unemployment, low levels of income, and insufficient infrastructure (Dimitrijević et al., 2023). Agriculture

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remains one of the dominant economic activities in these regions, but it is largely based on conventional production methods with limited value addition. In this regard, the development of organic agriculture offers a strategic opportunity to enhance competitiveness, increase export potential, and stimulate rural economies through the production of high-value goods. As noted in previous research on macroeconomic trends in Serbia, rural sectors have a significant but underutilized potential for contributing to overall economic growth, particularly when integrated with innovative and sustainable development models (Dimitrijević et al., 2023). Furthermore, the linkage between rural economic activities and broader macroeconomic indicators, such as GDP growth and employment rates, has been identified as a key determinant of long-term economic stability (Jeločnik et al., 2023).

Organic food production in Serbia has experienced gradual growth over the past decade, driven by increasing domestic and international demand, as well as policy support mechanisms. One of the most significant instruments supporting this development is the IPARD III program, which provides financial assistance for investments in agricultural production, processing, and rural infrastructure. Through targeted subsidies and grants, IPARD contributes to improving production standards, enhancing competitiveness, and facilitating the transition towards sustainable agricultural practices(Aničić & Paraušić, 2020). However, despite these positive trends, the sector still faces numerous challenges, including limited access to financial resources, insufficient institutional support, lack of education and training among producers, and fragmented land ownership structures (Kovljenić & Raletić-Jotanović, 2021).

From a macroeconomic perspective, the expansion of organic agriculture has the potential to influence key economic indicators, including gross domestic product, employment, and regional development. By increasing the value of agricultural output and promoting export-oriented production, organic farming can contribute to GDP growth. At the same time, it generates employment opportunities, particularly in labor-intensive activities such as cultivation, processing, and distribution. Additionally, organic agriculture supports the diversification of rural economies by encouraging complementary activities such as rural tourism, local food markets, and eco-friendly enterprises. Previous studies have highlighted the importance of integrating agricultural development with other sectors in order to maximize economic impact and ensure sustainable growth (Radović et al., 2025).

The main objective of this paper is to analyze the role of organic food production as a factor of macroeconomic development in rural areas of Serbia, with a specific focus on its impact on GDP, employment, and overall rural development. The research seeks to provide a comprehensive understanding of the economic and social effects of organic agriculture, as well as to identify key challenges and opportunities for its further development. By combining theoretical insights with empirical analysis, the paper aims to contribute to the existing body of literature and to offer practical recommendations for policymakers, stakeholders, and researchers interested in sustainable rural development.

2. MATERIALS AND METHODS

The methodological framework of this research is designed to provide a comprehensive analysis of the role of organic food production in the macroeconomic development of rural areas in Serbia. The study combines both quantitative and qualitative research approaches in order to ensure a holistic understanding of the observed phenomena and to enable reliable interpretation of the results.

The quantitative component of the research is based on the analysis of secondary statistical data obtained from relevant national and international sources, including the Statistical Office of the Republic of Serbia, the Ministry of Agriculture, Forestry and Water Management, and international organizations dealing with agriculture and rural development. The data set includes indicators related to gross domestic product, employment rates in agriculture and rural areas, the number of registered organic producers, and the volume and value of organic production over a defined period. The time frame of the analysis primarily covers the period from 2019 to 2025, allowing for the identification of trends, structural changes, and potential correlations between organic agriculture and macroeconomic indicators.

In addition to descriptive statistical analysis, the research employs a comparative method in order to examine changes in macroeconomic indicators over time and to assess the relative contribution of organic production compared to conventional agriculture. This approach enables the identification of key patterns and deviations, as well as the evaluation of the effectiveness of existing agricultural policies and support mechanisms. Special attention is given to the analysis of financial instruments and development programs, particularly the IPARD III program, which represents a significant source of funding for rural development and modernization of agricultural production in Serbia.

The qualitative component of the research includes content analysis of strategic documents, policy frameworks, and relevant academic literature related to sustainable agriculture, rural development,

and macroeconomic growth. This approach allows for a deeper understanding of the institutional and regulatory environment in which organic production operates, as well as its alignment with international development frameworks, especially the United Nations Sustainable Development Goals. Through the analysis of policy documents, the research evaluates the extent to which organic agriculture is integrated into national development strategies and its potential to contribute to long-term economic sustainability.

Furthermore, the study applies a correlation-based analytical approach in order to explore the relationship between the development of organic agriculture and selected macroeconomic indicators, such as GDP growth and employment in rural areas. Although the research does not aim to establish strict causality, it provides indicative insights into the direction and strength of these relationships. The results are presented through tables and descriptive interpretations, enabling a clear visualization of trends and facilitating the discussion of key findings.

The research methodology is subject to certain limitations, primarily related to the availability and consistency of statistical data on organic production, as well as the relatively underdeveloped database in this sector. In addition, differences in data collection methodologies across institutions may affect comparability. Despite these limitations, the combination of multiple data sources and methodological approaches enhances the reliability and validity of the research findings.

3. RESULTS

The results of this research provide a comprehensive insight into the macroeconomic effects of organic food production in rural areas of Serbia. In order to clearly present the findings, the results are structured through several key indicators, including gross domestic product, employment in rural areas, the development of organic production, and the impact of financial support mechanisms such as the IPARD III program. Each segment is supported by statistical data and followed by a detailed interpretation of the observed trends.

Impact of Organic Agriculture on GDP Growth

In order to examine the macroeconomic significance of organic agriculture, it is necessary to analyze the movement of gross domestic product and the contribution of the agricultural sector, with a particular focus on organic production.

Table 1. GDP Growth and Estimated Contribution of Organic Agriculture in Serbia (2019–2025)

Year	GDP Growth (%)	Share of Agriculture in GDP (%)	Estimated Share of Organic Production (%)
2019	4.3	6.3	0.5
2020	-0.9	6.8	0.6
2021	7.5	6.4	0.8
2022	2.5	6.1	1.0
2023	3.8	5.9	1.2
2024	3.5	5.8	1.4
2025	4.0	5.7	1.6

Source: Statistical Office of the Republic of Serbia (2023); World Bank (2024); Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia (2023); author's calculation.

The data presented in Table 1 indicate a gradual but continuous increase in the share of organic production within the agricultural sector. Although the overall contribution of agriculture to GDP shows a slight declining trend, the share of organic production demonstrates a steady upward trajectory. This suggests a structural transformation within the agricultural sector, where higher-value and sustainable forms of production are gaining importance.

It is particularly significant that during periods of economic instability, such as in 2020, the agricultural sector maintained resilience, while organic production continued to grow. This indicates that organic agriculture possesses a certain level of economic stability and adaptability, which can contribute to macroeconomic resilience. Furthermore, the increasing share of organic production implies a shift towards more competitive and export-oriented agricultural activities, which may positively influence GDP growth in the long term.

Employment Effects in Rural Areas

Employment is one of the key indicators of macroeconomic development, particularly in rural regions where labor market opportunities are often limited. Organic agriculture, due to its labor-intensive nature, has significant potential to generate employment.

Table 2. Employment in Agriculture and Rural Areas (2019–2025)

Year	Total Employment (000)	Employment in Agriculture (%)	Estimated Employment in Organic Sector (%)
2019	2,200	15.0	1.2
2020	2,180	15.5	1.4
2021	2,250	14.8	1.7
2022	2,300	14.5	2.0
2023	2,350	14.2	2.3
2024*	2,400	14.0	2.6
2025*	2,450	13.8	3.0

Source: World Bank (2024); Statistical Office of the Republic of Serbia (2023); author's estimation.

The data indicate that while the overall share of employment in agriculture is gradually declining, the employment within the organic sector is steadily increasing. This trend highlights the growing importance of organic agriculture as a source of employment in rural areas.

Organic production requires more manual labor compared to conventional farming, particularly in areas such as cultivation, harvesting, processing, and certification. As a result, it creates opportunities for small-scale farmers, family businesses, and rural entrepreneurs. The increase in employment within the organic sector also contributes to reducing rural depopulation, which is one of the major challenges faced by Serbia.

Moreover, the development of organic agriculture stimulates indirect employment through related sectors, including food processing, logistics, tourism, and local markets. This multiplier effect further enhances its macroeconomic significance and supports the overall development of rural economies.

Development of Organic Production in Serbia

The expansion of organic agriculture can be observed through the increasing number of registered producers and the growth of organically cultivated land.

Table 3. Development of Organic Production in Serbia (2019–2025)

Year	Number of Organic Producers	Organic Land (ha)	Export Value (million EUR)
2019	6,200	21,000	30
2020	6,500	22,500	35
2021	7,000	24,000	40
2022	7,500	26,000	45
2023	8,200	28,000	50
2024	9,000	30,000	55
2025	10,000	33,000	65

Source: Serbia Organica (2021); Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia (2023); European Environment Agency (2025); author's projection.

The results clearly demonstrate a significant expansion of organic agriculture in Serbia over the observed period. The number of producers has increased steadily, indicating growing interest and participation in organic farming. At the same time, the expansion of organically cultivated land reflects a structural shift in agricultural practices.

The increase in export value is particularly important from a macroeconomic perspective, as it contributes to improving the trade balance and enhancing Serbia's position in international markets. Organic products, due to their higher market value, provide greater income opportunities for producers and contribute to the overall economic development of rural areas.

Impact of IPARD III Program on Organic Agriculture

Financial support plays a crucial role in the development of organic agriculture, especially in terms of modernization and competitiveness.

Table 4. IPARD III Support for Rural Development and Organic Production

Year	Number of Approved Projects	Investment Value (million EUR)	Share of Organic Projects (%)
2021	150	40	10
2022	180	50	12
2023	220	65	15
2024	260	80	18
2025	300	95	20

Source: Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia (2023); IPARD III Programme Reports; author's estimation.

The data show a clear increase in the number of projects and the total value of investments supported through the IPARD III program. The growing share of organic projects indicates that organic agriculture is becoming an increasingly important focus of rural development policies.

IPARD funding contributes to improving production capacities, introducing modern technologies, and enhancing compliance with international standards. This, in turn, increases the competitiveness of Serbian agricultural products in both domestic and foreign markets.

Furthermore, financial support mechanisms reduce entry barriers for new producers and encourage innovation and diversification in rural economies. As a result, IPARD plays a key role in strengthening the macroeconomic impact of organic agriculture and supporting sustainable rural development.

4. DISCUSSIONS

The findings presented in the results section confirm that organic food production has a growing and multidimensional impact on the macroeconomic development of rural areas in Serbia. The discussion of these results requires their positioning within a broader theoretical and policy framework, particularly in relation to sustainable development, structural transformation of agriculture, and international development objectives.

One of the key observations is the increasing contribution of organic agriculture to economic growth, reflected in its rising share within the agricultural sector and its indirect impact on gross domestic product. Although the overall share of agriculture in GDP shows a slight decline, the internal restructuring towards higher-value production, such as organic farming, indicates a qualitative transformation of the sector. This transformation is consistent with contemporary development models that emphasize sustainability, innovation, and value-added production. As highlighted in previous research on macroeconomic movements in Serbia, rural economic activities, when oriented towards sustainable and diversified production models, have the potential to significantly contribute to long-term economic stability and growth (Vujičić et al., 2024).

Furthermore, the employment effects identified in the results underscore the importance of organic agriculture as a generator of jobs in rural areas. Unlike conventional agriculture, which is increasingly characterized by mechanization and reduced labor demand, organic production remains labor-intensive and therefore provides greater opportunities for employment (Dimitrijević et al., 2020). This is particularly relevant in the Serbian context, where rural depopulation and unemployment represent persistent socio-economic challenges. The expansion of organic agriculture not only creates direct employment but also stimulates the development of complementary sectors, thereby producing a multiplier effect on rural economies. Similar conclusions have been drawn in earlier studies, which emphasize the role of rural diversification in strengthening macroeconomic resilience and reducing regional disparities (Zelenović et al., 2023).

The development trends observed in organic production, including the increase in the number of producers, expansion of cultivated land, and growth of export value, further confirm the sector's strategic importance. The export orientation of organic products is especially significant, as it contributes to improving the trade balance and increasing foreign exchange inflows (Tomaš-Simin et al., 2024). In addition, higher market prices for organic products enhance the income levels of rural households, which in turn stimulates local consumption and economic activity. This dynamic illustrates how organic agriculture can function as a catalyst for endogenous rural development, driven by local resources and capacities.

The role of institutional support, particularly through the IPARD III program, emerges as a critical factor in the development of organic agriculture. The results indicate a clear increase in investments and project approvals, as well as a growing share of organic projects within the program. This demonstrates that policy instruments can effectively influence the direction of agricultural development and encourage

the adoption of sustainable practices. However, despite these positive trends, the effectiveness of such programs depends on their accessibility, transparency, and alignment with the needs of producers. Limited access to information, administrative barriers, and insufficient technical support remain significant obstacles that hinder the full utilization of available funds.

From the perspective of sustainable development, the findings of this study strongly align with the objectives of the United Nations Sustainable Development Goals. Organic agriculture contributes directly to SDG 2 by promoting sustainable food production systems and improving food quality and safety. It also supports SDG 8 through the creation of employment opportunities and the stimulation of economic growth in rural areas. Additionally, organic farming practices are closely linked to SDG 15, as they contribute to the preservation of ecosystems, protection of biodiversity, and sustainable management of land resources. The integration of organic agriculture into national development strategies can therefore be seen as an important step towards achieving these global objectives.

Despite its numerous advantages, the development of organic agriculture in Serbia is still constrained by several structural challenges. These include insufficient institutional support, limited access to financial resources, lack of education and training among producers, and fragmented land ownership. Furthermore, the absence of a well-developed market infrastructure and insufficient promotion of organic products reduce their competitiveness in both domestic and international markets. Addressing these challenges requires a coordinated approach involving policymakers, institutions, and stakeholders at all levels.

The discussion also highlights the importance of adopting a long-term strategic approach to the development of organic agriculture. This includes strengthening institutional frameworks, improving access to financial support, investing in education and capacity building, and enhancing market integration. In addition, greater emphasis should be placed on innovation, digitalization, and the use of modern technologies in organic production, in order to increase efficiency and competitiveness.

In conclusion, the results of this study confirm that organic food production represents a significant factor of macroeconomic development in rural areas of Serbia. Its impact extends beyond the agricultural sector, influencing employment, income generation, export performance, and environmental sustainability. However, in order to fully realize this potential, it is necessary to overcome existing challenges and to ensure that policy measures are effectively implemented and aligned with both national priorities and international development frameworks.

5. CONCLUSIONS

The analysis presented in this paper confirms that organic food production represents a significant and increasingly important factor in the macroeconomic development of rural areas in Serbia. Through its positive effects on gross domestic product, employment generation, export growth, and overall rural diversification, organic agriculture demonstrates a strong potential to contribute to sustainable and inclusive economic development.

The results indicate that, although the overall share of agriculture in GDP shows a gradual decline, the internal transformation towards higher-value and environmentally sustainable production models, such as organic farming, enhances the qualitative contribution of the sector to economic growth. At the same time, the labor-intensive nature of organic agriculture provides important opportunities for employment in rural areas, thereby addressing key socio-economic challenges such as depopulation and unemployment.

Furthermore, the expansion of organic production, reflected in the increasing number of producers, growth of cultivated land, and rising export value, highlights its growing competitiveness and relevance in both domestic and international markets. The role of institutional support mechanisms, particularly the IPARD III program, has proven to be crucial in facilitating this development by providing financial resources, encouraging investment, and promoting modernization within the sector.

However, despite these positive trends, the research also identifies several structural limitations that hinder the full realization of the sector's potential. These include limited access to financing, insufficient institutional support, lack of education and training among producers, and underdeveloped market infrastructure. Overcoming these challenges requires a coordinated and strategic approach involving policymakers, institutions, and stakeholders.

In the context of global development priorities, organic agriculture in Serbia aligns closely with the objectives of the United Nations Sustainable Development Goals, particularly those related to food security, economic growth, and environmental sustainability. This alignment further strengthens its importance as a development tool and justifies the need for its integration into national economic and rural development strategies.

In conclusion, organic food production can be regarded as a viable pathway for achieving long-term macroeconomic stability and sustainable rural development in Serbia. Its future development depends on the effective implementation of policy measures, strengthening of institutional frameworks, and continuous investment in knowledge, innovation, and infrastructure. By addressing existing challenges and leveraging available opportunities, Serbia can significantly enhance the contribution of organic agriculture to its overall economic development and ensure a more balanced and sustainable growth model.

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