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Organic Agriculture as a Future Strategy for Sustainable Farming

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Abstract. *Organic agriculture, as a holistic system, aims to maximize the productivity of agricultural sector by integrating tradition, innovation and science, helping to improve the quality of agrifood products reaching the market. One of the most rapidly evolving sectors in the EU is the organic manufacturing industry. Due to the increased interest of consumers it has had a significant increase in the last decade. This paper offers a detailed perspective on organic agriculture in Romania in the context of current European development. We present essential information about the organic sector, current legislation and market data, at national and European level. Official data show that organic agriculture has registered an increase in plant and animal production in recent years in Romania. Although it represents a small part of the cultivated area and total production, organic agriculture is attracting attention due to the principles of sustainable development and the associated economic opportunities.*

Keywords: organic production, organic agriculture logo, regulatory framework.

Introduction

Ecological agriculture, also known as organic agriculture, is a system of agricultural production that emphasizes the use of sustainable practices, respecting principles such as the conservation of natural resources, the promotion of biodiversity and the elimination or minimization of the use of synthetic chemicals. This paradigm of agriculture is a constantly evolving field, marking the transition to more ecological and socially responsible production systems. From a scientific perspective, the analysis of the dynamics of cultivated areas within ecological agriculture becomes essential for evaluating the impact of this model on natural resources and economic performance.

Globally, specialized literature reveals a significant increase in interest and practices in organic agricultural production. In the context of this evolution, Romania is no exception, and recent research has highlighted the multiple advantages and challenges associated with the transition from intensive farming to organic agriculture.

Therefore, in this article we explore and analyze this dynamic, contextualizing it in the light of innovative and sustainable business strategies, with the aim of supporting the sustainable development of organic agriculture. The novelty of the paper resides in providing an overview of the regulatory frameworks in both Romania and the European Union, while the exploration of per capita spending on organic food offer unique insights into broader trends and consumer behavior, enriching the understanding of the organic agriculture landscape. This comparative approach

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provides a broader perspective on the variations in adoption rates and trends, facilitating a good understanding of dynamics of organic agriculture at the European level.

Literature review

Organic agriculture, as a holistic system, aims to maximize the productivity of agricultural sector by integrating tradition, innovation and science, helping to improve the quality of agrifood products reaching the market. The organic manufacturing sector ranks among the most dynamic industries in the EU, experiencing significant growth over the last 10 years in response to growing consumer demand (Directorate-General for Agriculture and Rural Development, 2023; European Commission, 2019). In Romania, there is a significant increase in the areas dedicated to ecological agriculture, an obvious trend of the transition from conventional practices to ecological ones (Fortea et al., 2022; Rodino et al., 2017) .

The specialized literature emphasizes the increase in the number of farmers interested and involved in this change, with an emphasis on the reasons underlying the adoption of these sustainable practices (Antohe and Suvorov, 2021). At the same time, the challenges associated with this transition are highlighted, such as access to certification, market fluctuations, climate change, endowment with machinery, existing technologies to protect crops, which can affect the sustainability and viability of organic agriculture (Rodino et al., 2017; Marin et al., 2023). In this context, the Romanian government has started to offer support and incentives for farmers involved in organic farming. These efforts represent necessary approaches for overcoming the challenges and the positive consolidation of ecological agriculture in the Romanian agricultural landscape (Jităreanu et al., 2022).

In the context of ecological agriculture, cultivation practices are integrated into the principles of sustainability. For example, the use of manure is not only a traditional practice, but also a sustainable and efficient business model. Manure, usually from farms with organic farming practices, provides the essential nutrients plants need, helping to maintain soil fertility without resorting to synthetic chemical fertilizers. This business model involves the efficient collection, processing and distribution of manure to farmers, with obvious benefits for both the environment and agricultural production. The importance of using efficient agricultural machinery in this context becomes necessary, ensuring proper manure management and optimizing field application processes. Modern farm machinery can help distribute manure evenly, reducing losses and maximizing resource efficiency (Stefan et al., 2019). Also, the use of biobased products in organic agriculture represents a promising perspective for the future, offering a sustainable and ecological alternative to chemical fertilizers and pesticides, thus contributing to increasing the sustainability of agricultural production systems and obtaining healthier and more ecological productions (Clark, 2020; Rodino et al., 2015).

The potential of organic agriculture as an innovative solution to conventional agricultural challenges in developing countries, was highlighted in a recent study (Shiri 2021). The author was emphasizing the role of agricultural extension and education services in fostering acceptance among farmers. It was demonstrated that key variables such as reading research articles, social network usage, and information sources positively influence the attitude of agricultural extension workers toward organic farming. The study is suggesting actions such as encouraging farmers to engage with scientific research and leveraging mass media for public awareness to promote sustainable and environmentally friendly agribusiness practices in developing nations.

The EU organic market is dynamic, with growth rates varying from country to country. In May 2020, the Farm to Fork strategy of the European Commission (EC) clearly defined the role of organic products as keyfactor of development. The strategy states that "The organic food market will continue to grow and organic farming should be further promoted". In this context, our aim was to present an overview of the dynamics of organic agriculture in Romania and its broader implications in European context.

Methodology

The hypotheses of this research include an exploration into the dynamics of organic agriculture in Romania and its broader implications in European context. Therefore, our aim was to research on increased Interest in Organic Agriculture in Romania (H1), reflecting a presumed shift in consumer and farmer preferences towards sustainable and environmentally friendly farming practices. The regional variability in organic agriculture adoption within Romania (H2), acknowledging the diverse agricultural landscapes that may influence the acceptance and implementation of organic farming practices across different regions was also explored. Beyond national boundaries, we investigated the impact of the Farm to Fork Strategy on organic farming in Europe (H3), exploring if this policy initiative has generally influenced the agricultural practices. Hypothesis 4 examines the market demand and market maturity for organic products in Europe, anticipating shifts in consumer preferences and the broader economic landscape.

To investigate the hypotheses of the study the methodology employed included a combination of quantitative and qualitative research approaches. First, a brief literature review was conducted to gather existing knowledge on organic agriculture trends, legislative compliance with European trends and regional variability in Romania. Subsequently, a quantitative analysis was carried out using statistical data to identify the overall perspectives on organic farming in Romania. Regional variability was examined by collecting data by geographical areas within Romania. Legislative compliance and support were reviewed by an analysis of relevant policies and their impact on organic farming. The influence of the Farm to Fork Strategy on organic farming in Europe was assessed through a comparative analysis of cultivated areas. Market demand and organic market maturity for organic products in Europe was evaluated by studying market trends and per capita spending.

Research study utilized publicly available data accessible from the official website of the Ministry of Agriculture and Rural Development (MARD, 2023), the Romanian National Institute of Statistics, Eurostat data and IFOAM data, for a period of ten years. Annual data was retrieved for latest available data. To complement the analysis, data from specialized and scientific literature were incorporated as referenced. Information has been processed by analyzing, evaluating, and comparing data from tables and charts, facilitating the identification of current status and future trends.

Results and discussions

In general, the rules and standards for organic farming are set to promote sustainable farming practices that protect the environment and provide healthy food products. Although member states must align their legal framework with EU regulations, legislation on organic farming can vary by country. However, some general aspects of the legislation in organic agriculture are preserved across all countries. These main aspects consider the following key elements:

- ✓ Organic certification is issued by accredited certification bodies and requires compliance with specific standards of the European regulation

- ✓ Organic farming emphasizes avoiding the use of pesticides and synthetic chemical fertilizers. Instead, the use of natural pest control methods and the incorporation of organic fertilizers into agricultural practices are encouraged.
- ✓ Organic agriculture promotes the maintenance and improvement of biodiversity. Farmers are encouraged to protect wetlands, forests and provide spaces for animals' natural habitats.
- ✓ In the case of livestock farms, it is required to use organic feed and provide adequate spaces for animals, promoting their well-being.
- ✓ Las but not least, organic farmers must responsibly manage water, soil and other environmental factors. Irrigation and water management must be done efficiently and the soil must be protected against erosion.
- ✓ To be marketed under the organic logo, organic products must be properly labeled to inform consumers of their origin and production method.

The legislation in the field of organic agriculture is harmonized throughout the European Union, being regulated by Council Regulation (EC) no. 848/2018 updated on 01.01.2022. This regulation which cancels Regulation (EEC) no. 834/2007 constitutes an essential legal framework for organic production and labeling of organic products within the EU, referring to both EU production and imports from non-EU countries.

The European regulations create a comprehensive legal framework for all aspects related to organic products starting with the production, distribution, control and labeling of organic products in the European Union. They define the principles, the scope and the rules of organic production and specify how organic products must be labelled, for being allowed to be marketed inside the member states of the EU. All of the EU member states are required to comply with these rules, and in addition, some countries have adopted additional rules to specifically regulate their own agricultural producing sector or processing for food industry.

In Romania, the legislation on organic farming fully complies with EU regulations. The legislation on organic agriculture in Romania represents a detailed and up-to-date legal framework, aligned with the rules imposed by the European Union. As regulated by Romanian rules, the term "ecologic agriculture" is used across the country for defining the production of agricultural products under the organic framing regulation. In accordance with the provisions of European Regulations, organic farmers in Romania are subject to a rigorous system of regulations. Initially introduced into national legislation in 2000 by Government Emergency Ordinance no. 34/2000, the legislation was subsequently consolidated by Law no. 38 of 2001. This requires organic producers in Romania to obtain certification from nationally accredited control bodies, thus ensuring compliance with ecological standards. The certification allows the use of the national logo for organic products (Figure 1), owned by the Ministry of Agriculture and Rural Development, underlining respect for the Romanian legislation on organic agriculture. Through this legislation, the transparency, sustainability, and quality of organic products are promoted, contributing to the sustainable development of the agricultural sector in our country.

European Union logo

Romania logo

Figure.1 The organic agriculture logo for European Union and for Romania

Within the European Union, the dynamics of areas cultivated in the ecological system are significantly influenced by current strategies developed, such as the Green Deal and Farm to Fork, which aim at the transition towards sustainable agriculture and environmentally friendly food production. These strategies place high demands on natural resource management, conservation and protection of the biodiversity, increasing animal welfare and development of sustainable production standards. Moreover, the consumers are increasingly interested in organic products originating from local, sustainable agricultural practices and this trend is also contributing to the increase in organic farming area.

The largest share of organic land as a proportion of all agricultural land in the European Union (EU-27) at 26.5 percent was reach in 2021 in Austria. Austria was followed by Estonia, which had a share of approximately 23 percent (Figure 2).

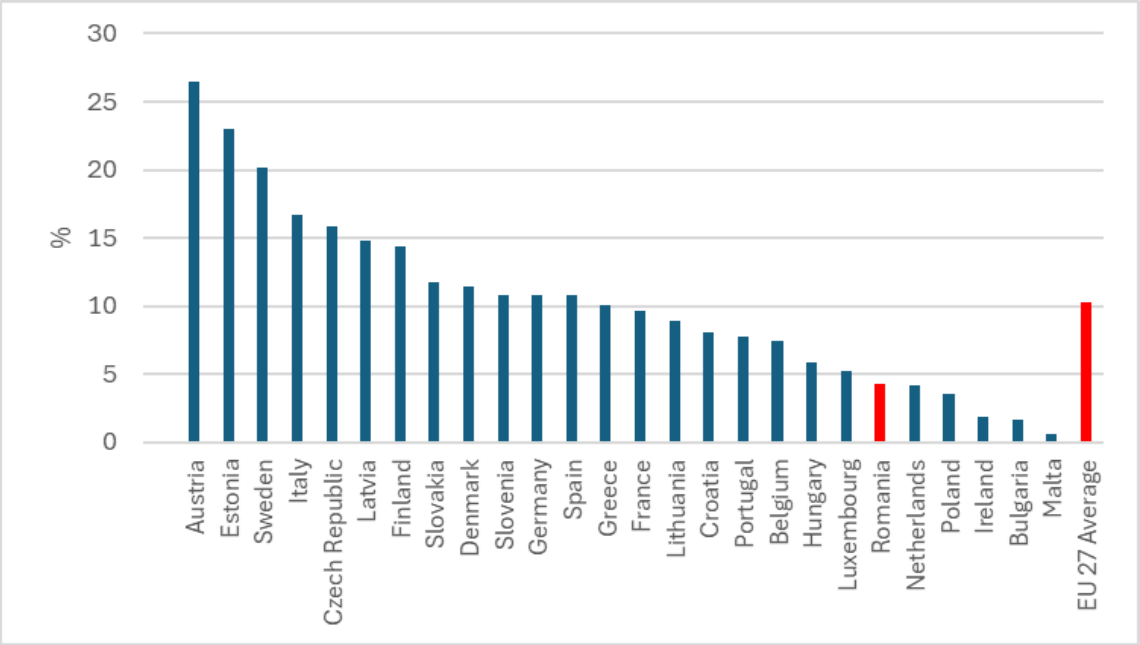

Figure 2. Share of total utilized agricultural area (UAA), by country, occupied by organic farming, as of 2021

Source: Data from eurostat sdg_02_40.

Predominant organic system crops in Europe include cereals, vegetables, fruits and oilseeds, with a particular focus on promoting diversity and crop rotation to improve soil fertility and reduce environmental impact (Figure 3).

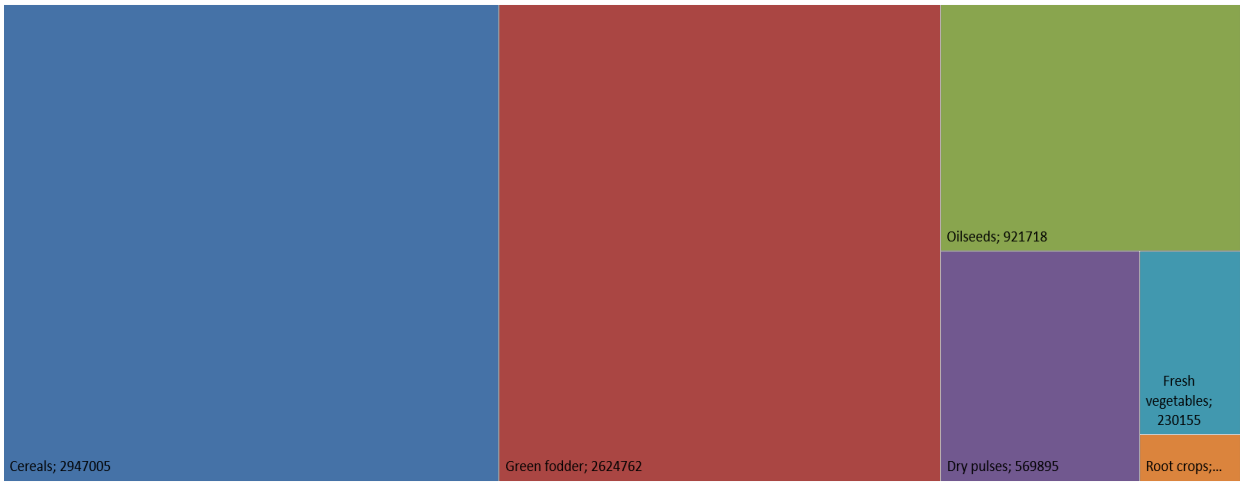

Figure 3. Area for arable organic crops in Europe in 2021, by crop (in hectares)

According to the data sourced from the Eurostat database for the year 2022, comparing it with the situation before the implementation of the Farm to Fork (F2F) strategy in 2020, notable fluctuations in the area under organic farming across various European countries are observed. In table 1 is provided a comprehensive overview of the dynamics in the adoption of organic farming practices across these European countries in the context of the Farm to Fork strategy.

Romania experienced a notable increase of 37.46%, while Cyprus and Ireland demonstrated a substantial growth of 30.94%, respectively of 28.17%. at the opposite pole, Denmark, Norway and Germany reported modest increases of 0.02%, 1.83% and respectively 2.52%, Bulgaria experienced a 5% decrease and Sweden a 2.18% decrease.

Table 1: Increase of area under organic farming 2022 vs before farm to fork strategy (2020) * data In table represent available data for the year 2022 on Eurostat database.

Country	2020	2022	Increase after F 2 F vs before F 2 F 2022/2020
Bulgaria	116,253	110,441	-5.00%
Czechia	540,375	563,527	4.28%
Denmark	299,998	300,057	0.02%
Germany	1,590,962	1,630,984	2.52%
Estonia	220,796	231,011	4.63%
Ireland	74,666	95,701	28.17%
Spain	2,437,891	2,675,331	9.74%
Croatia	108,610	129,374	19.12%
Cyprus	5,918	7,749	30.94%
Lithuania	235,471	271,329	15.23%
Luxembourg	6,118	8,255	34.93%

Country	2020	2022	Increase after F 2 F vs before F 2 F 2022/2020
Portugal	319,540	759,977	137.83%
Romania	468,887	644,520	37.46%
Finland	316,248	339,459	7.34%
Sweden	610,543	597,204	-2.18%
Norway	45,181	46,006	1.83%
Switzerland	176,337	185,224	5.04%
Montenegro	4,823	3,966	-17.77%
North Macedonia	3,727	8,724	134.08%
Türkiye	382,639	310,584	-18.83%

According to IFOAM publication, World of agriculture, the 2023 edition, it is outlined the retail sales value of organic agricultural products in selected European countries for the year 2021. Germany leads the market with the most significant retail sales value of over 15,000 million euros, highlighting its robust market for organic products. Following closely, France and reported retail sales values of over 12,000 million euros. Italy and Switzerland contributed to the organic product retail sector with close to 4, 000 million euros each.

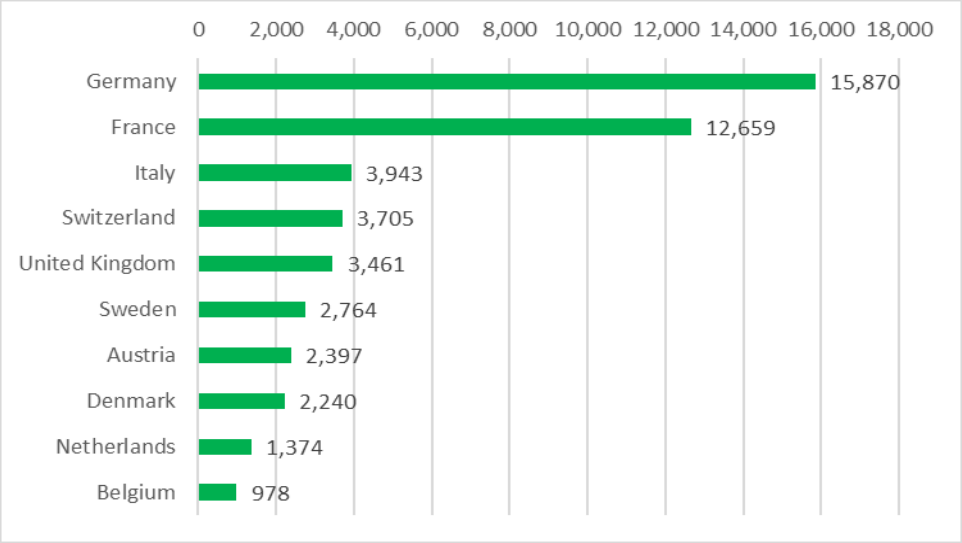

Figure 4. Retail sales value of organic agriculture products, European level, in the year 2021, by country (expressed in million euros*)*

These figures emphasize the growing consumer demand for organic agricultural products across Europe, with Germany and France emerging as prominent markets. The data also reflects the varying degrees of adoption and market maturity in different countries, shedding light on the economic significance of the organic agriculture sector in the European retail landscape.

For Romania, the most recent data reported were from 2016, reaching 41 million euros. The number of operators is steadily increasing in Romania since 2017, reaching over 14.000 operators in 2021 (Figure 5)

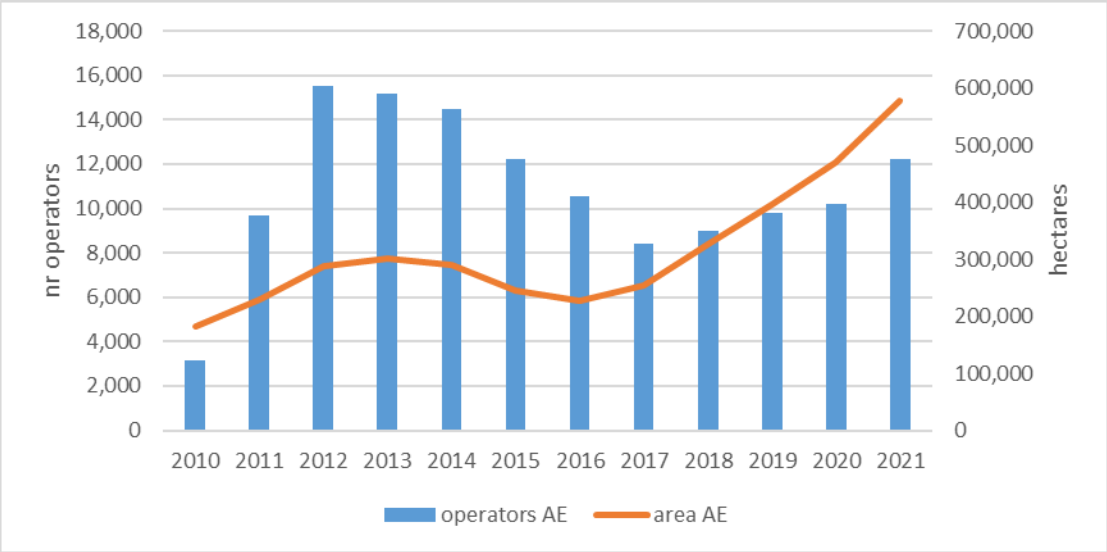

Figure 5. Dynamics of organic area and operators, Romania

Source: Data Source: MARD data

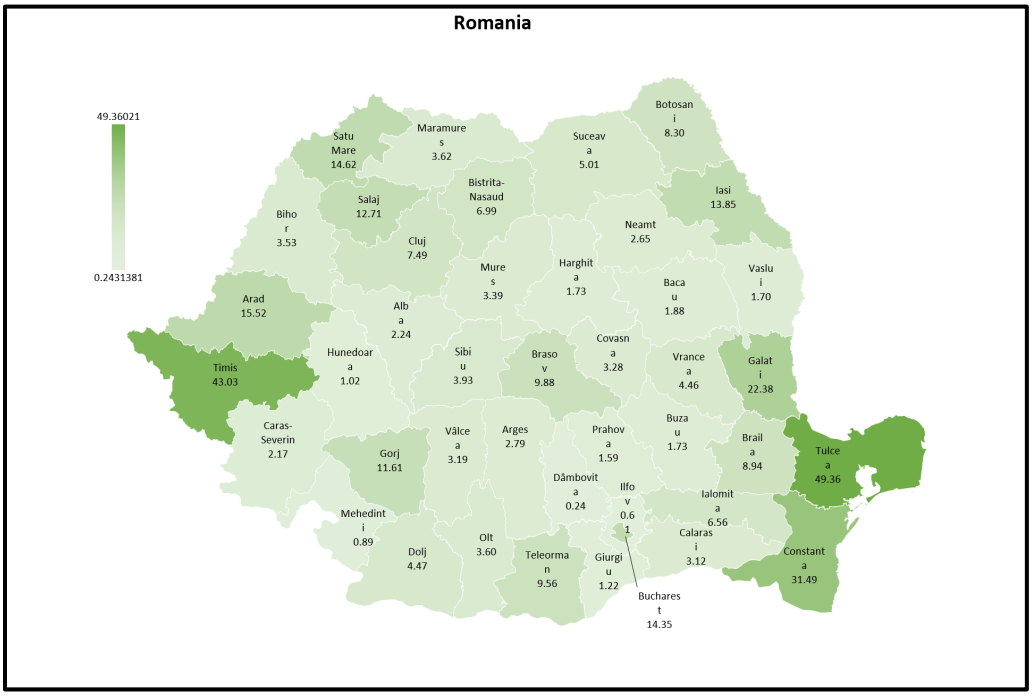

Figure 6. Territorial profile of area under organic farming, Romania, 2022 (thousand hectares)

The regional analyzes highlighted the variability between different areas of the country (Figure 6.), indicating the influence of climatic, geographical and socio-economic factors on the adoption of organic agriculture. Of course, this diversity reflects an adaptation of farmers to local specificities and market needs.

Going farther with this research, per capita spending on organic food was analysed. This indicator serves as a metric for assessing the individual-level economic contribution to the organic food market within a specific population. It is calculated by dividing the total expenditure on organic food within a given region by the population size on that region. This metric is very important for the design of a business strategy in organic agri-food sector, as it is providing insights into consumer behavior, preferences and the extent to which individuals allocate financial resources towards organic food consumption.

The significance of such data lies in the supposed ability to reflect the socio-economic patterns, environmental consciousness, and dietary choices within a population. Higher per capita spending will indicate increased consumer awareness and willingness to pay for organic products, driven by considerations such as health, sustainability, and ethical production practices. As individuals increasingly prioritize these factors in their purchasing decisions, per capita spending on organic food becomes a key indicator of the broader societal shift towards more environmentally friendly and health-conscious lifestyles.

As awareness of the health and environmental benefits of organic produce increases, consumers are likely to allocate a greater portion of their food budgets to organic options. So looking ahead, the trend of increasing per capita spending on organic food suggests a positive outlook for the organic food industry. This trend may further drive the innovation in the organic food sector, prompting increased availability and diversity of organic products in the market. In figure 6 are plotted the data for per capita spending on organic food in selected countries in Europe in 2021 (in euros). For several countries available data were older than 2021, and the year was put into brackets. While the Europe's average value for spending on organic food is a little bit over 100 euros, In Romania this value was 2 euros per person (Figure 7). This means that the market needs important attention for development by the design of appropriate national strategies towards sustainable consumption and production.

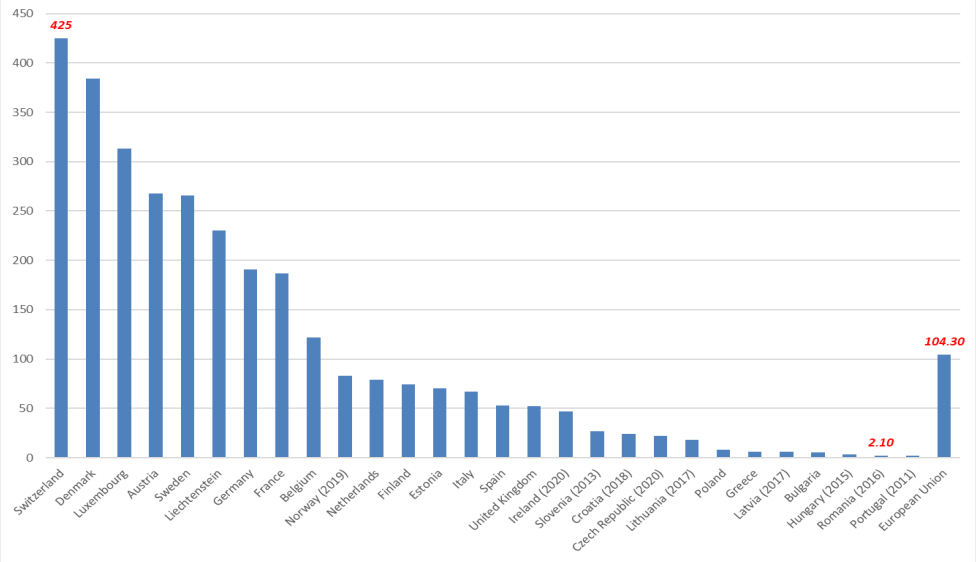

Figure 7. Per capita spending on organic food in selected countries in Europe in 2021 (expressed in euros)

Source: Data from World of organic agriculture, 2023.

The growing approach to organic agriculture in Romania is validated and supported by a series of studies and research from the specialized literature. In the same time, recent studies reported that in Romania, there is a growing awareness of the potential benefits of organic farming, although with distinct dynamics from the situation in other European countries (Brumă et al., 2020, Florian et al., 2020). While organic farming in western European countries is embraced by a significant majority of consumers, Romania is still navigating the transition. For future research studies, the gap between positive beliefs about organic products and actual consumption patterns among occasional and non-consumers is a key focus of analysis.

A recent study (Clark, 2020) highlighted that the diversification of organic crops can lead to better resistance to climate change, while other studies (Holka et al., 2022; Smith et al., 2019) points out that organic farming can reduce gas emissions greenhouse effect and can limit the negative impact on water and soil. Also, studies highlight a growing trend among consumers to prefer organic products, which indicates an expanding market for farmers involved in this form of agriculture (Barna et al., 2010; Antohe and Suvorov, 2021; Jităreanu et al., 2022). These findings, together with data from the literature, suggest that adopting an ecological farming model could not only improve the sustainability of the agricultural sector, but also provide significant environmental and public health benefits (Vasile et al., 2015).

Organic farming is emerging as a viable business strategy for sustainable agriculture, and the integration of solid business elements becomes essential in this transition. Taking into consideration that the environmental concerns and consumer health are becoming increasingly important for both producers, consumers and decision makers, adopting an organic farming business model is becoming an option. The growing trend of consumers to prefer organic products (Brata et al., 2022), reflected in the increase in sales and per capita expenditure in this market segment, opens up opportunities for agricultural entrepreneurs. In this context, business strategies should integrate not only technical aspects of ecological practices, but also responsibly approach legislative requirements and specific regulations, as well as capitalize on government support and incentives offered. The international context, influenced by strategies like the Green Deal and Farm to Fork, introduced an important layer to business considerations of organic farming.

Regarding the proposed hypotheses the data suggest a significant increase in interest and practices in organic agricultural production in Romania (H1). The analysis of the dynamics of organic areas in Romania validate this hypoyhesis. Moreover, the data indicated variability in the adoption of organic agriculture in different areas of Romania (H2), most probably influenced by climatic, geographical, and socio-economic factors. Validation of H3 is proposed by analyzing the data presented in Table 1 on the increase in organic farming area in Europe after the implementation of the Farm to Fork strategy.

The market data section presented retail sales values of organic agricultural products in selected European countries, with a focus on Germany and France as major markets. The market market maturity for these countries was assessed by an indicator related to per capita spending.

To further discuss on perspectives for organic farming in Romania we need to explore the gap between positive beliefs and actual consumption patterns, and this is a limitation of the present work.

Conclusion

In Romania, in the context of the current requirements for sustainability and conservation of natural resources organic agriculture represents an essential component of the evolution of the agricultural system. Compared to the European Union, Romania has registered a significant increase in ecologically cultivated areas in recent years, reflecting an adaptation to European requirements and trends regarding sustainable agriculture. This dynamic of expanding the areas dedicated to organic agriculture in the country is also supported by the growing preferences of Romanian consumers for organic products, thus motivating producers to adopt these more sustainable agricultural practices.

Romanian consumers show an increasingly pronounced predilection for organic products, as they are perceived as having superior nutritional qualities and as being less exposed to chemical substance residues. In order to meet this increase in demand for healthy and sustainable products the Romanian farmers are encouraged to adapt their farming practices to obtain certification for organic farming.

The dynamics of organically cultivated areas in Romania is also influenced by government policies, which encourage the transition to more environmentally friendly production methods and promote access to financial support schemes for farmers involved in organic agriculture. Despite the obvious progress, Romania is still in the process of aligning with the average level of the European Union in terms of areas dedicated to organic agriculture, and the potential for expansion remains significant. Therefore, organic agriculture in Romania not only reflects compliance with European standards, but also represents an opportunity for the sustainable development of the agricultural sector, promoting food safety, biodiversity conservation and reducing the negative impact on the environment. It is essential that this evolution continues and is supported by coherent policies, advanced agricultural education and continued consumer awareness of the benefits of choosing organic products.

References

Antohe, R., Suvorov, N. (2021). Strategies for feeding the world more sustainably with organic agriculture, In: Agrarian Economy and Rural Development - Realities and Perspectives for Romania. International Symposium. 12th Edition, The Research Institute for Agricultural Economy and Rural Development, Bucharest, pp. 296- 302

Barna, C., Epure, Manuela, Vasilescu, R., Gudei, Corina (2010). Eco-agriculture: a successful business biodiversity model. Romania Case, Proceedings of 2010 International Conference on Environmental Science and Development (CESD 2010),World Academic Union/World Academic Press, UK.

Brata, A.M., Chereji, A.I., Brata, V.D., Morna, A.A., Tirpe, O.P., Popa, A., Arion, F.H., Banszki, L.I., Chereji, I., Popa, D.; et al. (2022). Consumers' Perception towards Organic Products before and after the COVID-19 Pandemic: A Case Study in Bihor County, Romania. *Int. J. Environ. Res. Public Health*, *19*, 12712. https://doi.org/10.3390/ijerph191912712

Brumă S., Vasiliu C., Tanasă L., Dobos S. (2020) The perception of consumers from the North-East region of development of Romania of organic produce, Agrarian Economy And Rural Development - Realities and Perspectives for Romania, International Symposium 11th Edition, 2020, pag 100- 110

Cardei, P.; Popa, L., Ladislau, D., Ciuperca, R., Stefan, V. (2019). Influence of the manure spreading machines' working parameters on the qualitative performances of the fertilization process. INMATEH Agricultural Engineering. 58. 115-120. 10.35633/ INMATEH-58-12.

Clark, S. (2020). Organic Farming and Climate Change: The Need for Innovation. Sustainability, 12, 7012. https://doi.org/10.3390/su12177012

Directorate-General for Agriculture and Rural Development; Organic farming in the EU: a decade of growth; https:// agriculture.ec.europa.eu/ news/ organic- farming- eu- decade- growth- 2023-01-18_en, accessed on 15 feb 2024

European Commission (2019), "*The European green deal"* available at: https:// ec.europa.eu/ info/ strategy/ priorities- 2019- 2024/ european- green- deal/ delivering- european- green- deal_ en, accessed on 21 ian 2024

Florian, V., Rusu, M., Roșu E. (2020) Ecological agriculture and biodiversity -relationships, congruences, objective conditions and perceptions of local actors produce Agrarian Economy And Rural Development - Realities And Perspectives For Romania International Symposium , 11th Edition, 2020, pag 211- 219

Fortea, C., Antohi, V.M., Zlati, M.L., Ionescu, R.V., Lazarescu, I., Petrea, S.M., Cristea, D.S. (2022) The Dynamics of the Implementation of Organic Farming in Romania. *Agriculture* , *12*, 774. https://doi.org/10.3390/agriculture12060774

Holka, M.; Kowalska, J.; Jakubowska, M. (2022). Reducing Carbon Footprint of Agriculture — Can Organic Farming Help to Mitigate Climate Change? *Agriculture*, *12*, 1383. https://doi.org/10.3390/agriculture12091383

Jităreanu, A.F., Mihăilă, M., Robu, A.-D., Lipșa, F.-D., Costuleanu, C.L. (2022). Dynamic of Ecological Agriculture Certification in Romania Facing the EU Organic Action Plan. *Sustainability*, *14*, 11105. https://doi.org/10.3390/su141711105

Marin, A., Dragomir, V., Pop, R., Butu, M. (2023). The evolution of Romanian agriculture mechanization degree. *INMATEH-Agricultural Engineering*, *71* (3).

Rodino, S., Butu, A., Petrache, P., Butu, M., Dinu-Pirvu, C. E., Cornea, C. P. (2015). Evaluation of the antimicrobial and antioxidant activity of Sambucus ebulus extract. *Farmacia*, *63*(5), 751- 754.

Rodino, S., Butu, M., Fidler, G., Marin, A., Butu, A. (2017). Current strategies for the protection of organic crops in vegetables production. *Sci Pap Ser B Hortic*, *61*, 303- 306.

Shiri, N.(2021), Attitude toward organic agribusiness: an approach to developing sustainable business",British Food Journal, Vol. 123 No. 10, pp. 3265-3276.

Smith, L.G., Kirk, G.J.D., Jones, P.J. *et al.* (2019). The greenhouse gas impacts of converting food production in England and Wales to organic methods. *Nat Commun,* **10**, 4641. https://doi.org/10.1038/s41467-019-12622-7

Vasile, A.J., Popescu, C., Ion, R.A., Dobre, I. (2015). From conventional to organic in Romanian agriculture—Impact assessment of a land use changing paradigm. Land Use Policy, 46, 258–266.

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