



# **Articulating Organic Agriculture and Sustainable Development Goals: Serbia Case Study**

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Abstract: With the greening of agriculture, there is a need to better link the sustainable development goals (SDGs) and organic agriculture in developing countries. However, in Serbia, there is a huge gap between the potential of their implementation and the actual situation. This paper assessed the strengths and weaknesses of SDGs and organic agriculture in Serbia and how their relationship can contribute in the development of sustainable agriculture. Key data and indicators of the economic, agricultural and social development of Serbia from international and national databases, as well as recent publications related to the selected topic, were assessed. The results showed that the restricted development of organic agriculture in Serbia stems from the undeveloped awareness of consumers, slower acceptance of alternative agricultural systems and the volatility of mainstream conventional agricultural production. The integration of organic agriculture into the largest conceptual and strategic frameworks, such as the SDGs, can offer a true transformation of local food systems and could result in positive feedback to the environment and society. In the long term, the SDGs framework can help connect various dimensions of sustainable agriculture, stakeholders and policymakers. The future focus should be on how to create entry points for agricultural transformation based on certified organic methodologies and how to integrate agricultural heritage into the realisation of SDGs.

**Keywords:** sustainability; food systems; food security; agroecology; organic farming; environmental protection; agricultural knowledge

## 1. Introduction

## 1.1. The Sustainability Debate

The international Brundtland report [1] has made a significant advancement toward global sustainability and opened a narrative of sustainable development which lasts until today. Subsequently this concept has become a pivotal paradigm that underpins modern society and the economy, responsible for the means and methods by which we exploit our natural resources, meeting global society's goals [2]. From its establishment, the concept of sustainability has been recognized as a three-dimensional paradigm, but later on, environmental and ecological issues became a key concern and point of confrontation, leading to many actions and numerous publications (resolutions, reports, conventions, etc.).

This can be seen especially in agriculture, where sustainable development provides an agenda on outcomes but does not provide information on the methods to be used to accomplish the expected goals. The issue is even more complicated if we take into account



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**Copyright:** © 2024 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https:// creativecommons.org/licenses/by/ 4.0/). that agricultural production and its perception extends through several dimensions and domains and expands from the local to the global level [3]. Agriculture is considered the world's biggest employer and largest economic sector for many countries. However, rural people, who produce 80 percent of our food, make up four-fifths of the global poor [4]. Nowadays, it makes perfect sense to talk about agriculture as a global system and an indisputable part of a world ecosystem or a global agro-sphere. That is why the sustainability of agricultural production is possible only if the global ecosystem reaches a certain level of sustainability. Given that the process of food production in agriculture relies on the use of natural assets, agriculture can affect the functioning of the environment to a great extent. As a result, the current attempt to associate sustainable development with agricultural performance may be misleading and needs to be challenged, because outcomes of sustainable agriculture and food security do not completely match. We hypothesize that food production is a key pillar of food availability [5]; therefore, agricultural production will continue to be a key area of intervention. In line with this, a sustainable approach in agriculture suggests the aim to 'feed everyone sustainably, equitably and healthily; that addresses needs for availability, affordability and accessibility; which is diverse, ecologically-sound and resilient; and which builds the capabilities and skills necessary for future generations' [6], but says nothing about where food comes from, how it is produced or at what environmental cost [7,8]. Alongside this, the current system of agricultural production has difficulties encompassing the farm vs. food systems approach and successfully embedding sustainable dimensions (social, economic and environmental) into the new challenges of the 21st century. Consequently, agricultural food systems require a comprehensive redesign, so that the optimum production results are ensured, along with value chains changing sociological and economic dimensions [9]. This must be done simultaneously at the local level, guided by the principles of the bottom-up approach to ensure the outcomes of SDGs at the global level by fixing broken food chains and social programs [10].

#### 1.2. The Synergies between SDGs and Local Food Security

There is a growing concern that, with the increasing global population and affluence, the pressure on agricultural and natural systems will increase. It is estimated that agriculture directly enables the achievement of 12 out of the 17 SDGs [11]. More recently, there is an growing amount of evidence that agriculture emerges as a central pillar for the achievement of all SDGs and holds the 17 SDGs together [12]. Therefore, agriculture represents the universal entry point for accelerating development priorities both locally and globally, whether to develop agricultural systems or through policy intervention [13]. Some ASEAN countries (the Association of Southeast Asian Nations), rich in natural resources, experienced difficulties in sustainable development but overcame obstacles by enhancing produced capital, which contributed to a higher GDP [14]. Some authors elucidate that, globally, SDGs 12, 13, 14 and 17 are the most important/influential on the rankings, while SDGs 1, 6 and 7 are least important [15]. Accordingly, poverty, clean water and energy are still underestimated and neglected in SDGs achievement. In a comprehensive analyses for India, study [16] reported a higher priority on SDGs 2, 3, 5, 6, 7 and lower on SDGs 1, 13 and 17 and drew attention to how regional heterogeneity must be considered. Based on those findings, it can be summarized that some SDGs are still disregarded, although significant efforts and financial resources are allocated, especially in developing countries. Moreover, there are SDGs that are easier to achieve, so more money and resources are invested in them, which leaves some other SDGs neglected. Given the limitation for individual achievement of SDG goals, it is necessary to use different approaches, and there are diverse concepts and pathways that could result in SDGs implementation, such as sustainable intensification [17], climate-smart agriculture [18], agroecology [19], organic agriculture [20], eco-labels [21], agriculture 4.0 [22], carbon neutrality [23] and others, whose outcomes vary in dependence on a trade-off and synergies between agricultural productivity and environmental protection. Warinda et al. [24] presented results for the developing countries of East Africa where innovation and technology adoption, and investments in agriculture, resulted in well-being

outcomes. A multi-dimensional approach to problem solving can be a key advantage for achieving sustainability, but it is necessary to connect and harmonize approaches in solving problems. All these concepts should be embedded as part of systemic changes that facilitate the implementation of SDGs. Also, they need to be scaled out in a way that respects the specification and requirements of local food systems. This can ensure a quantum leap in agricultural development toward SDGs and strengthen the role of agriculture, and balance trade-offs through innovation breakthroughs that can trigger profound changes, leading to simultaneous and interlinked reconfigurations of multiple parts of the global food system [25]. Today, we can agree that globalization has been beneficial to agriculture, but up to now, it has not offered a solution for food security. Under such circumstances, it might not be possible to sustain current rates of agricultural productivity and growth, while intensifying pressure on an already degraded environment, with climate change, soil depletion and water scarcity [26–29]. Sumberg [30] summarized that, in the future, agricultural success will depend on the relationship between agriculture and nature, and particularly showed how this relationship is framed by those promoting the idea of their arrangement. Accordingly, sustainable development goals have made a significant contribution to defining the problems in agriculture, but there are other priority areas (quality, safety, sovereignty, etc.) that shape a sustainable food production system and need to be considered to achieve food security and sustainability in all spheres. Hence, some specific solutions could not be easily scaled up and replicated; so, they should be assessed independently for a particular region or country. At the moment, agriculture in Serbia follows the global trends coming from the EU, with commitment to the SDGs' achievement. However, the structure of agriculture and the farms themselves are not able to follow the changes that lie ahead (like legislation based on EU), which has a direct impact on the efficiency of production [31]. Taking into account the need to implement ecological and sociological regulations, while striving to maximize yields, creates pressure that mainly targets primary production. A common problem for organic farmers is that they have to develop and maintain their production, their brand and their search for consumers, while at the same time keeping up with documentation. If, for some reason, they are less efficient in one activity, they will fail. Therefore, the objectives of this study are to (i) elucidate how Serbia fits into the global context of SDGs and the local realization of sustainable practices (organic agriculture) and (ii) articulate development in Serbia in delivering and mainstreaming sustainable agriculture.

## 2. Materials and Methods

#### Methods and Data Collection

Key data and indicators were used in describing the economical and agricultural situation in Serbia according to the Statistical Yearbook of Serbia [32] and UN Serbia [33]. According to recent data [32], the total territory of the Republic of Serbia is 88.499 km<sup>2</sup> and should be considered provisional, because the borders with neighboring countries were only administrative, i.e., not marked or mathematically defined. Total population in 2022 was 6,871,547 inhabitants. Serbia's GDP for 2022 amounted to 63.5 billion USD, while its agriculture share in the section of agriculture, forestry and fishing was 6.3%. The share of crop production in the total value of agricultural production corresponded to 67.5%, and that of livestock production equaled 32.5%. The utilized agricultural land covers an area of 3,439,887 ha, with a share in total land of 44.3% and an average of 0.48 ha agricultural land per capita. The Republic of Serbia was granted European Union (EU) candidate status on 1 March 2012 by the European Council. The overall score index and spillover were taken from Sachs et al.'s [33] publication, and it was applied as a measure of a country's total progress towards achieving all 17 SDGs (https://dashboards.sdgindex.org, accessed on 9 August 2023). The overall score can be interpreted as a percentage of SDG achievement for each country. A score of 100 indicates that all SDGs have been achieved. The spillover index estimates spillovers along three dimensions: environmental and social impacts embodied in trade, economy and finance, and security. A higher

spillover score means that a country causes more positive and less negative spillover on other countries' abilities to achieve the SDGs. A comparison of regional SDG progress has been performed in relation to the region of East Europe and Central Asia where Serbia belongs. The Republic of Serbia works on implementation and harmonization with strategic UN documents and the development and implementation of the sustainable development agenda and assessment of SDG goals on the online platform (https://sdg.indikatori.rs, accessed on 1 December 2023), where 116 indicators out of 247 are reported and monitored. Some specific indicators for monitoring the SDGs can also be found at the Environmental Protection Agency, within the Ministry of Environmental Protection (http://www.sepa. gov.rs, accessed on 1 December 2023). Data on the organic agriculture area in Serbia were derived from Simić [34] and Willer et al. [35] and the Ministry of Agriculture Forestry and Water Management (MAFWM) [36]. The share of land area used for agriculture measures a percentage of total land area in each country. Agricultural land refers to the share of land area that is arable, under permanent crops or under permanent pasture, according to data obtained from the Food and Agriculture Organization of the United Nations (via the World Bank) [37]. The Global Food Security Index (GFSI) established a set of indicators for 113 countries considering the issues of food affordability, availability, quality and safety, and natural resources and resilience. The index is considered as a dynamic quantitative and qualitative benchmarking model which is constructed around 58 unique indicators that measure the drivers of food security across both developing and developed countries. For calculation of the GFSI, indicator scores are normalized and then aggregated across categories to enable a comparison of broader concepts across countries [38]. Cost and Affordability of a Healthy Diet (CoAHD) are estimated to show the population's physical and economic access to the least expensive locally available foods to meet requirements for a healthy diet, as defined in food-based dietary guidelines (FBDGs). To determine whether a diet is affordable or not, the cost of a healthy diet is compared with a standard of income. These data were obtained from the FAO [39] (2023).

#### 3. Results and Discussion

#### 3.1. SDG Status and Perspectives in Serbia

As a relatively novel global strategy, SDGs in Serbia are well grounded in theory, but there is still a lot of continued effort in the long run for their achievement [40]. The root of the problem is that many global solutions are difficult to scale down to the local level and exploited by a large number of practitioners. As a global concept, it can affect all levels of society at the same time; combined with advanced communication capabilities, it can increase the availability of ideas and solutions on the SDGs. This can ensure that a key aspect of sustainable development is met—the needs of future generations. However, a recent study conducted in the Western Balkans [41] suggests that even the younger generation (14–30 years old) does not have an adequate understanding of the SDGs.

The overall score index measures a country's total progress towards achieving SDGs. This index for Serbia in 2023 amounted to 77.3%. There is a stable but slow increase in the index score compared over time and compared to 2020 when the score was 71.22%. In 2023, the overall ranking of Serbia is 36 of a total of 166 Countries [42]. A higher individual score for Serbia was obtained for 2 out of 17 goals, such as eradication of poverty (Goal 1) and quality of education (Goal 4). Significant challenges remain for Goals 5 and 10, while challenges remain for Goals 2, 3, 6, 8, 9, 11, 12, 13 and 16. It appears that a major obstacle for Serbia remains with Goal 15—life on the land. Of particular interest is the achievement of Goal 2 as an indicator that covers sustainable agriculture and food security issues (Figure 1), which is gradually increasing in recent years. Serbia's position in the context of SDG achievement can be compared to reighboring countries that encompass similar characteristics in terms of agriculture development and food production [43,44]. The SDG ranking for Serbia is lower compared to Croatia (12), Hungary (22) and Romania (35) but the obtained results outperformed Bulgaria (44), Bosnia and Herzegovina (47), North Macedonia (60) and Montenegro (67) (Table 1). It is also evident that the SDG

achievement of Serbia in 2023 falls behind the region of East Europe and Central Asia, and this is particularly marked for Goals 1, 2, 3, 4, 9 and 17. It is noticeable that in the recent period, the number of indices for assessment of SDGs in Serbia increases, but collecting data also remains a challenging task, as unavailability for some of the SDG indicators presents a limitation for studying achievement toward SDGs [44]. Therefore, future efforts should focus on better strategies in collecting data, in order to permit their wider application and understanding. Among the listed countries (Table 1), a higher SDG index score was achieved in Croatia (81.5) and the lowest in Montenegro (71.5). Serbia has comparable results to those of neighboring countries listed in Table 1 in terms of SDG index scores and spillover index, and so far holds a middle position.



**Figure 1.** Sustainable development goal achievement (0–100%) for 2023 of Serbia relative to East Europe and Central Asia countries [42]. Numbers 1–17 indicate different SDGs.

Country	SDG Indicators 2023						
Country	Country Rank	SDG Index Scores	Spillover Index				
Croatia	12	81.5	75.8				
Hungary	22	79.4	80.1				
Serbia	36	77.3	86.6				
Romania	35	77.5	81.7				
Bulgaria	44	74.6	88.1				
Bosnia and Herzegovina	47	74.0	89.3				
North Macedonia	60	72.5	90.8				
Montenegro	67	71.4	77.2				
East Europe and Central Asia	n.a.	71.8	91.1				
EU27	n.a.	72.0	63.8				

Table 1. The sustainable development goals 2023 [42].

SDG-sustainable development goal; EU27-27 countries of European Union. n.a. rank not available.

There is a general public view that not much action has been taken in the preparation and increasing institutional capacity regarding the SDGs, but Serbia is on the way to aligning national policies with the United Nations Agenda for Sustainable Development by 2030. To comply with the requirement of the SDGs, the conference "How to Reach Sustainable Development in Serbia: UN Agenda 2030" initiated public debate and connected stakeholders from different sectors (http://www.ciljeviodrzivograzvoja.net/, accessed on 1 December 2023). For a long time, progress towards achieving the SDGs has been slow, but in recent years we have seen an increase in the realization of SDGs as a result of interest in environmental issues and raised awareness about their importance. The progress report from 2022 indicated that Serbia is making progress towards the achievement of Agenda 2030 in several key areas in 43 indicators and showed a high degree of resilience to multiple stresses [33]. But as seen from Table 1, it is a long process that must involve all spheres of society. In assessing the socio-economic vulnerability of SDGs in Serbia, Matović and Lović Obradović [45] identified three indicators: economically inactive population, population without primary education and gross added value per capita as major obstacles. Recent data showed a total of 76.6 million USD of investment in SDG achievement in Serbia to 92 ongoing activities, with unequal distribution to individual goals. The highest share of resources goes to SDGs 10, 11 and 16, while the lowest was allocated for SDGs 6, 1 and 7 (https://serbia.un.org/en/sdgs, accessed on 1 December 2023). A recent publication, 'Thematic update sustainable food systems', recommended a green transformation of the Serbian food system towards a more inclusive, sustainable and equitable growth model, which includes climate change mitigation and biodiversity loss [46]. This shows a general interest in agriculture and its position on the list of priorities for the implementation of SDGs in Serbia, but there seems to be little support for those activities that are more closely related to agriculture and especially primary food production.

#### 3.2. Contribution of Organic Agriculture to Sustainable Development in Serbia

Practical examples of different types of sustainable agricultural systems can be identified in Serbia, such as permaculture, biodynamic agriculture, regenerative agriculture, agroecology and organic agriculture, but there is also a significant overlapping between them. Although there is a high awareness and need to introduce ecological principles and sustainable intensification, so far, areas under the sustainable agriculture systems in Serbia occupy only a small land-use area; they are not adequately accepted by all farmers, and a significant part of the production is export-oriented [47]. The fact is that many of these sustainable farming systems were firstly being adopted by NGOs, small farmers and, more recently, by large commercial companies. Various studies have confirmed that there is a positive attitude towards the consumption of products that come as a result of sustainable production [48–51]. Organic farming can contribute to sustainable development by showing the model of production or being the lighthouse for sustainability. In other words, this may be the optimal model for achieving SDGs as the most widespread alternative system in Serbia. The advantage of organic agriculture is that there is traceability of production and a clearly defined system for both producers and consumers. As opposed to other sustainable systems, organic farming has been identified with distinctive objectives and a multifunctional approach; it takes up a larger area and is considered to be mainstream in terms of sustainability, compared to the other sustainable farming system for which data were not available. Also, due to seasonal migrations between Serbia and the countries of Western Europe, many consumer trends and habits that started in those countries are present in Serbia. It is important to mention that the pioneers of organic agriculture farming in Serbia were motivated by a desire to resolve long-standing problems of conventional production—environmental pollution, the decline in soil quality, biodiversity loss, lower food quality, nutrients and ubiquitous rural poverty [52]. Today, the organic sector is successfully expanding and gaining in importance with respect to the raised awareness of safe food production and environmental protection. This has led to a balanced approach to organic farming and the development of specificities that are the result of agroecological preconditions and socio-economical background. Organic production in Serbia has been gradually developing for more than three decades [34,52], but statistical monitoring dates back to 2005 (Figure 2). At the same time, institutional and legal regulation in line with EU standards began. The review of the historical data of organic production in Serbia identified emerging trends and showed that many operators in the sector are trying hard to advance on the road defined by the Plan for Organic Agriculture Development in Serbia 2021–2026 [53]. This plan is a part of the National Rural Development Program of the

Republic of Serbia, 2018–2020, which was adopted by the Government of the Republic of Serbia in 2018. This strategic program strongly supports the development of organic production in Serbia and identifies the challenges that impede its development and defines aims and measures to overcome them. Figure 2 shows that the area under organic production has increased by roughly 30 times from the beginning and the number of producers by not as many times (Figure 2, Table 2). One of the weaknesses of the organic sector stems from the fact that, for a long time, the subsidy policy for organic agriculture in Serbia was not separated from conventional agriculture and therefore shared the same fate as conventional agriculture.



Figure 2. Changes in land area under organic agriculture in Serbia (source: MAFWM [54]).

Country	Indicators	Years						Relative	
		2010	2012	2014	2016	2018	2020	2022 *	2010/2022 (%)
Hungary	Organic area (ha) Producers Organic share (%)	127.605 1.557 3.02	130.609 1.560 3.1	124.841 1.672 2.7	$186.347 \\ 3.414 \\ 4.0$	209.382 3.929 4.5	301.430 5.128 6	293.597 5.129 5.9	+230 +329 +195
Bulgaria	Organic area (ha) Producers Organic share (%)	25.648 717 0.84	39.137 2.754 1.3	74.352 3893 2.4	160.620 6.964 3.5	128.839 6.471 3.5	116.253 5.942 2.3	86.310 5.942 1.7	+453 +828 +273
Romania	Organic area (ha) Producers Organic share (%)	72.300 2.986 1.4	288.261 15.315 2.1	289.252 14.159 2.1	226.309 10.083 1.7	326.260 8.518 2.5	468.887 9.647 3.5	578.718 11.562 4.3	+800 +387 +307
Croatia	Organic area (ha) Producers Organic share (%)	23.351 1.125 1.8	31.903 1.528 2.4	50.054 2.194 3.8	93.593 3.546 6.0	$103.166 \\ 4.374 \\ 6.6$	108.610 5.153 7.2	121.924 6.024 8.1	+522 +535 +450
Serbia	Organic area (ha) Producers Organic share (%)	8.635 224 0.2	6.340 202 0.1	9.548 215 0.2	$14.358 \\ 286 \\ 0.4$	19.254 373 0.5	20.971 439 0.6	23.527 458 0.7	+272 +204 +350
North Macedonia	Organic area (ha) Producers Organic share (%)	35.164 342 3	12.731 554 3.3	3.146 331 1.19	3.245 509 1.3	4.409 775 0.3	3.727 863 0.3	7.794 887 0.6	-451 + 259 - 500
Montenegro	Organic area (ha) Producers Organic share (%)	1.865 25 0.36	3.561 62 0.69	3.038 62 0.6	3.470 280 1.5	4.455 328 1.9	4.823 423 1.9	3.381 422 1.7	+181 +1688 +472
Bosnia and Herzegovina	Organic area (ha) Producers Organic share (%)	n.a. n.a. n.a.	n.a. n.a. n.a.	n.a. n.a. n.a.	n.a. n.a. n.a.	n.a. n.a. n.a.	1.692 n.a. n.a.	2.495 90 0.14	/ / /

Table 2. Basic data of organic agriculture of Balkan countries according to Fibl survey 2023 [35].

\* Due to COVID-19 restrictions, data of 2022 published in the 2023 report represent the survey from 2021; n.a.—data not available.

One of the preconditions for the development of sustainable agriculture is land availability, land policy and soil quality [54]. Analyzing the areas used in agriculture according to the World Bank [37], it can be seen that the countries of Eastern Europe (the Balkan Peninsula in general) lead in the share of land area used for agriculture. Romania has the largest share with 59% and Montenegro the smallest with 19%. Serbia has an average share of 40%, which is close to the EU27 average value, which amounts to 41%. These data are important because they can basically represent the potential for the development of organic agriculture in Serbia by taking the experience and capacities of conventional producers. The Ministry of Agriculture, Forestry and Water Management (MAWF) [36] and the Group for Organic Agriculture, which is in charge of maintaining the database on organic agriculture, have provided data indicating that in the following years, both the number of producers and the organic area will continue to expand. Currently in Serbia, 0.6% of the arable land has been allocated for organic farming. Since Serbia lacks an established approach for gathering data on the total area utilized for collecting and harvesting plant species from their natural environment, this area does not include land used for the collection of wild berries, mushrooms and herbs [34]. Since the beginning of organic development, Serbia's organic producers have primarily been classified into two general groups or types: the independent producers who have direct contractual relationships with control bodies, and agricultural cooperatives whose production is subject to group certification, as permitted by Serbian law. When compared to individual farmers, this kind of collaboration has a considerably greater participation rate, which indicates its great success. However, the strategic approach should be focused on creating incentives for and cooperatives of the farmers at the regional level. In addition to that, the first biodistrict in Serbia was created to help sustainably manage local resources [55]. This could be a step forward in the better articultaion of SDGs and organic agriculture.

The last decade also brought a more intensive development of the processing industry, domestic market and public consciousness, with the whole sector achieving significant results in export, about 29.7 million EUR, which proves the high demand for Serbian organic products both on the EU market and on other continents [34,36]. However, compared with neighboring countries, Serbia showed a slower development regarding the area, in terms of number of producers and organic land share (%) (Table 2). Considering the similar agroecological background of the Balkan countries, statistical data (2010–2022) indicate that only North Macedonia and Bosnia and Herzegovina showed a lower performance in some parameters compared with Serbia [35]. The country of ex-Yugoslavia and the EU countries were ahead with all indicators, as well as positive trends in growth compared with Serbia. Therefore, taking into account the current tendency in Serbia, it would be difficult to expect a dramatic growth in the organic agriculture area and increase in the number of producers in the near future. This means that there are many challenges in Serbia that have not been successfully overcome or properly addressed since the introduction of organic agriculture as an alternative to conventional agriculture.

Organic farming has a great potential to grow in Serbia, despite its undeniably substantial accomplishments and favorable agroecological settings, but there are still a lot of critical challenges that need to be appropriately addressed. Creating capital at every stage of the value chain, making better use of foreign funding and improving the effectiveness of production, processing and marketing are all critical concerns that must be resolved as Serbia's organic industry develops. To ensure the organic sector grows more intensively in the future, government policy must be more focused and must include clear, long-term, national initiatives that apply to all of society [54,56]. The concept of sustainable agricultural and rural development could be successfully implemented in the future with proper institutional support and greater utilization of available funds [57]. However, critics argue that, with organic agriculture, more area is needed to produce the same amount of food, and this expansion can only be achieved at the expense of areas allocated to nature, as explained in [58]. There is a general belief that consumers who are concerned about food safety are more likely to buy organic food [59]. According to Radojević et al. [48], consumers in Serbia make decisions about whether or not to purchase organic products primarily based on price and product quality, which is influenced by their socioeconomic status. The results of the research [60]. showed that organic food consumers in Serbia are more educated and have higher incomes. Thereby, eco-marketing should focus more on appealing to these already more environmentally and health-conscious' consumers, as this will help to improve the domestic market for organic products. In line with this, corresponding research in Serbia [48,51] showed a degree of mistrust regarding "organic" products. Therefore, it is imperative to establish trust and reinforce the producer certification system institutionally to allay any concerns.

#### 3.3. Synergies of Sustainable Development Paradigm and Organic Agriculture

The starting point for the expansion of the certified organic farming area in Serbia could be an idea that agriculture is not only about the activities and processes involved in producing food, but also about the environment, the people and institutions involved in producing, processing, delivering and ultimately consuming food [61–63]. Therefore, it is necessary to take a closer look at the relationships that exist among players in the food system or value chains and to examine a broader context of agriculture and local agricultural heritage in the development of organic agriculture in Serbia. The legacies of traditional agriculture allow us to increase the multifunctional nature of organic agriculture as an important issue in the development of rural areas during the 21st century [63].

At the moment, there is a weak link between organic farming and the SDGs in Serbia, both in practice and in the socio-economic domain. The assuption is that SDG implementation has the potential in organic agriculture to secure and accelerate innovation, knowledge transfer and economic growth [64]. However, in order to effectively achieve the SDGs, it is essential to build on the work being done at the local scale [63]. One of the obstacles to the poor link between organic agriculture and SDGs is that producers and consumers in Serbia recognize the sustainability concept as a purely ecological idea [65]. The perspective of SDG 1 depends on the successful communication and real partnership between the government and the local authorities, and in some cases, this can result in the stagnation and even the involution of certain social categories of the population [63]. The assumption is that ecology greatly underpins sustainable agriculture, relies on renewable resources and small-scale agroecosystems to create a self-sufficient food value chain. It is also a widely accepted idea that sustainable agriculture can be expanded with increased consumer requirements for healthy food consumption, and together they offer the possibility of a compromise between ecology, environmental protection and food security [65,66]. The global narrative is that the sustainable agricultural system cannot provide a sufficient quantity of production of food and plant products for other technical purposes as well as achieving economic efficiency. However a range of such systems can successfully meet goals and interact with natural habitats, preserving basic natural resources and energy, and protecting the environment [67]. Yet, Serbia has a considerable area with preserved natural resources, a large number of protected natural parks, small agricultural holdings and a relatively large number of farms, with extensive agriculture, especially in mountainous areas, where an underutilized environment has a higher potential for organic production [34,49,61]. Although abundant natural resources can be a significant advantage, their accelerated exploitation is not recommended, as it can lead to significant impacts on the environment and have a negative impact on the achievement of SDGs. This is indicated by the research of Nzié and Pepeah [68], which showed that countries that lag behind in achieving sustainability goals must be responsive to the use of natural resources. It is considered that a large part of the mountainous areas of Serbia is beyond the significant influence of intensive (conventional) agriculture and anthropogenic pressure. Agricultural production in these areas takes place without intensive agro-technical measures (mineral fertilizers and chemical means of protection), with diverse crop rotation, extensive self-sufficient livestock production and their own labor force. Therefore, organic agriculture would be very suitable as a way of managing natural resources in protected areas: national parks, nature reserves, water

supply zones, landscape features and other vulnerable and endangered parts of Serbia. As a modern model of agricultural production, based on biological principles, organic farming can provide a broader range of rural activities by including various economic actions and providing financial benefits not just for the food production that ovelaps with SDGs [69]. Encouraging organic production and integrating it with other production activities will preserve the diversity of rural performance and pave the way for the growth of multipurpose tourism, ecotourism and ethnotourism. Above all, it could create the conditions for people to stay in rural areas and establish small, self-sufficient farms. On the other hand, problems can hinder the exploitation of rural regions, the most important of which is the decline in population and the departure of young people from rural areas [70,71]. It will also have an impact on the promotion of a healthy diet, the production and processing of goods in accordance with traditional recipes, the preservation of traditional crafts, agro-tourism and other types of services that would create added value and encourage rural growth. Creating a favorable environment for the development of small farms, the conversion of conventional farms to organic and the development of this sustainable branch of agriculture would consequently create more favorable socio-economic conditions for rural areas and the employment of the rural population. Doing so would deepen relationships between producers and customers and increase trust and benefits. In order to rationalize the use of resources by agriculture and achieve a balanced development, it is necessary to carry out re-zoning that would identify favorable areas for organic farming. According to Pašakarnis et al. [70], zoning can contribute to land consolidation and production specialization, as in many countries territory valuation precedes the implementation of rural development programs. By considering organic agriculture as a mechanism for achieving sustainable development goals, different institutions can be mobilized and closely involved. In line with this, the authors recommend a multi-dimensional approach to the articulation of SDGs and organic agriculture, which must take place simultaneously at several levels and domains (Table 3).

Filed Level	Cropping System Level	Farm Level	Food Systems Level	National Level (Territorial Level)	International (Global)
Monitor soil quality/health	Explore and utilize beneficial ecosystem services	Identify lock-ins in farm management	Institutional connection	Systematic data gathering and validation	Enable knowledge transfer
Where possible using extensive measures and conservation zones	Use different crop rotations	Identify most important practices on the farm	Farm connections (biodistrict)	Policy support	Data harmonization
Adjusting the management systems to soil requirements	Crop diversification/new species/methods	Increase biodiversity	Shortening value chains	Lessen socio-economic barriers	Scientific and technological framework
Use beneficial allelopathic relationship	Conservation tillage	Agroforestry/ Silvo-pastoralism	Develop and adopt scheme and control PGS/GIS/food terroir	Raise consumer awareness	Cooperation and support from international institutions
Biological control measures	Growing perennials	Adaptation of co-innovation strategy	Promotion of diets (slow food)	R&D Support	
Improve crop residue management	Establish and maintain nutrient cycling	Horizontal learning	Connect different sustainable agricultural systems	Strategy monitoring	
		Increase local seed availability		Secure farmers and consumer organization support	

Table 3. Action needed at different levels for articulating the SDG goals with organic agriculture.

Such a paradigm can only be implemented if it is structured as a top-down approach to reach all producers; otherwise, the outcomes will be inadequate. This viewpoint conflicts with the bottom-up, or opposite-of-the-path, strategy advocated by agroecological science to develop a sustainable system. It has been demonstrated that the achievement of the objectives fails when institutions or actors in the value chain become disconnected. Given that organic food production involves short value chains and a reduced number of intermediaries between producers and consumers, scaling out organic agriculture can foster sustainable development [72]. Serbia, as a country with a large number of agricultural holdings in which small farms dominate, will open up opportunities for setting new strategic directions for agricultural development. However, it appears that, in Serbia, some food security issues have not been satisfactorily addressed, which may hamper the future development of sustainable agricultural systems. There is no evidence that the issue of food security and availability has been fully addressed. Food security for Serbia calculated on the basis of the global food security index (GFSI) has slowly increased over time. However, Serbia is lagging behind other southeast European counties with similar agroecological conditions. (Table 4).

Rank EU (1/26)	Country	Overall Score	Affordability	Availability	Quality and Safety	Sustainability and Adaptation
1	Finland	1	5	5	2	2
2	Ireland	2	2	5	6	3
3	Norway	3	19	22	5	1
4	France	4	8	8	4	6
5	Netherlands	5	1	4	8	10
18	Bulgaria	18	21	13	15	22
19	Greece	19	16	23	12	19
20	Hungary	20	20	16	22	21
21	Slovakia	21	14	24	17	18
22	Russia	22	24	20	16	22
23	Romania	23	22	21	17	24
24	Belarus	24	25	19	26	17
25	Serbia	25	23	25	24	26
26	Ukraine	26	26	26	25	25

Table 4. Global food security index (GFSI) of selected European counties after economic impact 2022 [38].

Currently, Serbia holds the 61th position on the global list of the overall performance of countries based on their 2022 food security [38]. The methodology of the GFSI model indicated two major challenges for Serbia: the volatility of agricultural production and food security and access to policy commitments. By analyzing the same index, Papić Brankov and Milovanović [73] suggested that a major weakness of the food security system in Serbia is purchasing parity per capita and corruption, which resulted in a lower gross domestic product compared with neighboring countries. According to the FAO [39,74], an estimated 11% of the population in Serbia cannot afford a healthy diet. Under such circumstances, food security needs to be compensating with conventional agriculture sector growth that will be followed by sustainable agriculture development. From the beginning, the low purchasing power of consumers has been an important limiting factor for the development of organic agriculture in Serbia [75]. The latest study [76] confirms that the main reason for buying organic food is health concerns, with no differences in perceptions across gender, age and country. Advocating sustainable agricultural development, particularly in protected areas, by helping to train future farmers, buying equipment and obtaining certifications in organic production contributes to the development of healthier agroecosystems and strengthens the link between organic farming and the SDGs. Furthermore, it will enable organic farmers to establish an area for production on their land where the lines between human and natural activities are blurred, with the long-term advantages for the present and future generations.

#### 4. Conclusions

This study showed that the accomplishment of the SDGs in Serbia does not sufficiently encourage activities connected to sustainable agriculture, particularly primary food production. As a result, sustainable agriculture systems are falling short and struggling in development, as they seek to establish their place within the SDG and ecological domains of food production. Organic agriculture in Serbia is creating a niche production within sustainable agriculture, an alternative to mainstream conventional production, attempting to redesign food systems from the bottom up and to achieve environmental, economic and social sustainability. Scaling out organic agriculture as a widespread concept of "food production" and integrating it into a larger strategic framework such as the SDGs can help connect various aspects of sustainable agriculture and different stakeholders and secure a pivotal position in healthy and safe food production, while protecting the environment. Accordingly, organic farming can be a pillar for agricultural sustainability by combining scientific research, community-based innovation and traditional food consumption. This paper provides evidence that neighboring countries are advancing faster in organic agriculture compared to Serbia and show a better trend in their development. Similarly, food security issues in Serbia have not been adequately addressed, which may impede the future growth of organic agriculture. The current approach has some limitations, which stem from the fact that the general understanding of organic agriculture in Serbia is biased by research from other countries, since there is no systematic and long-term field research on this production system. Furthermore, the introduction of the SDG agenda is divided between several national institutions, and it is unclear who is responsible for its implementation. Our study should be sought as an attempt to clarify the prerequisites that must be met, to provide entry points for agricultural transformation based on certified organic technologies and SDGs and to suggest an approach for future action in agriculture development.

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