

3.4. Organic farming and sustainable development of rural areas: A case study of Serbia

Svetlana Roljević Nikolić¹, Vesna Paraušić²

¹ Institut of Agricultural Economics, svetlana_r@iep.bg.ac.rs; ² Institut of Agricultural Economics, vesna_pa@iep.bg.ac.rs.

Abstract: Organic farming is an integrated, environmentally sound, safe and economically sustainable agriculture production system and since the mid-1980s has it become the focus of significant attention from policy-makers, consumers, environmentalists and farmers. The aim of the paper is to present current state of organic farming development in global and EU market, and also ways how does organic farming contribute to sustainable development of rural areas. The case study has given an overview of the state of organic farming development in Serbia and its impact on Serbian sustainable development. Organic farming in Serbia has a potential to provide positive externalities not only on environmental protection, but also in economic and social aspects, contributing to rural employment and helping sustainability of small farms. However, there are number of major hurdles and problems in this sector needed to be overcome. One major impediment is financial constraint at all levels of the value chain, another is poor organization of players along this chain, and the third one is low efficiency of production, processing, and marketing. Only by overcoming these constraints organic agriculture can contribute to the sustainable development of rural areas in Serbia.

Keywords: organic farming, sustainable development, rural development, Serbia.

1. Introduction

The term “sustainability” is derived from the Latin *sus tenere*, meaning “to hold”. It was first used in the field of ecology determining the ability of an eco-system to maintain a certain population over time. Later, the addition of the “development” context and formation of the expression “sustainable development” shifted the focus of this term from the environment to society. Today, the concept of “sustainable development” represents society and its need to include the environmental protection in the consideration of social changes, primarily through the changes related to economic functions (Baker & Mehmood 2015).

The first United Nations Conference on the Human Environment in Stockholm in 1972 recognized “the importance of using the environmental assessment as a management tool“. This was a huge step forward in the evolution of the sustainable development concept. Although the relationship between the issues of ecology and development was not strong at the time, there were

some indications that the previous manner of economic development had to be altered. The second United Nations Conference on Environment and Development held in Rio de Janeiro in 1992 adopted a declaration which institutionalized the concept of sustainable development.

There is no unique and generally accepted definition of this concept, so it is often a subject of debate. In 1996, the United Nations published the “Human Development Report” which defines the sustainable development as “the integral economic, technical, social and cultural development adjusted to the requirements of the environmental protection and improvement and enabling the current and future generations to satisfy their needs and improve the quality of life” (Roljević et al. 2009a). Therefore, sustainable development does not essentially intend to limit but to direct human development towards reaching better and more favourable conditions for the long-term preservation of all necessary resources.

The invitation to change the production based exclusively on quantity and maximum exploitation of natural resources was the only manner to direct the actions towards the protection, preservation and sustainability of the environment (Roljević et al. 2009b). Various ecologically acceptable models of food production have been developed in the previous decades in order to alleviate the negative impact of agricultural production on the environment. During the 1980s, a successful form of agriculture with the aim of sustainable development of primarily rural areas appeared. It was the concept of organic food production. This production created the most favourable correlation between the dominant ecological principles and ecological demands.

According to FAO/WHO, organic agriculture represents a complete production and management system which preserves and promotes health of natural resources and ecosystem. In addition, firm standards followed by certification and control, as well as strong international support, represent the positive tendencies in the environmental protection.

According to the Council Regulation (EC) 834/2007, organic production plays a dual societal role – “on the one hand it provides for a specific market responding to consumer demand for organic products, while on the other hand it delivers public goods contributing to the environmental protection and animal welfare, as well as to the rural development”.

Some research on organic production (Lobley et al. 2005, 15-16; Mzoughi 2011, 1536) indicates that farmer's commitment to organic farming far more depends of social, moral, and ecological elements, life philosophies and people's ideals, instead of economic concerns.

For the purposes of this research we used secondary data of the state of organic agriculture at the global and national level of the Republic of Serbia, and a desk method of research. As a source of data on organic agriculture worldwide we used the base of Research Institute of Organic Agriculture FiBL, respectively the Statistics.FiBL.org website. On the other hand, the Farm Structure Survey (FSS, 2018), provided by the Statistical Office of the Republic of Serbia, was used to show the basic characteristics of agricultural holdings in Serbia, while to assess to the state of organic agriculture in Serbia we used the base of Directorate for National Reference Laboratories (Group for organic production), which is part of the Ministry for Agriculture, Forestry and Water Management. The collected data were processed by descriptive statistics methods, and the obtained results are presented in tables and graphs.

The goals of the paper are analysis of the current state of organic farming development in global and EU market and presentation about how organic farming contributes to the sustainable development of rural areas. Also, through an overview of the state of organic farming development in Serbia, authors evaluate key potentials and problems in the sector and how this farming can contributes to the sustainable development of rural areas in Serbia.

2. Organic farming and sustainable development of rural areas

Since the greatest share of natural resources is in rural areas, the expansion of ecological systems

of food production considerably contributes to the revitalization of villages and stimulates rural development.

The contribution of organic agriculture to the overall sustainable rural development is reflected in the promotion of the rural area diversity, preserving and protection the environment while producing quality and safe food, labor market development, and human capital development (Pugliese 2001, 124-125; Lobley et al. 2005, 15-16; Kilcher 2007, 32; Roljević et al. 2017, 324). Local food markets represent the centre of the organic sector development, which indicates the inclination of consumers to shorter supply chains and emphasizes the significance of small and medium-sized businesses in terms of food procession and distribution. More intensive marketing practices related to local products increases the local employment, growth of processing, market growth and farm diversification (Poláková et al. 2013).

Organic farming is a driving force for rural development, especially in marginalized areas, as it enables economic development, attracting financial resources, diversifying activities and social cohesion. Also, owing to the application of appropriate production standards and new agro-technological knowledge, organic farming favours young people in the local areas, thus decreasing brain drain and promoting the development of the human capital in rural areas.

2.1. Organic farming contributes to the environmental protection

Organic agriculture represents a complete system of managing farms, involving the application of the best practices which protect the environment, preserve soil and biodiversity, as well as the application of animal welfare standards (Roljević et al. 2009b). Organic agriculture can be successfully related to the concept of sustainable development which focuses on the biodiversity preservation. Biodiversity protection in the organic farming system implies the use and preservation of the genetic potential of indigenous species or old varieties, races and local populations, which are invaluable for each area. Old types and varieties of crops adapted to local agro-ecological conditions and are less susceptible to the influence of stress factors, which significantly contributes to the stability of the yield (Roljević & Grujić 2013).

Organic agriculture contributes to the preservation of soil as a key resource for food production. Research has shown that soil bulk density is lower in organic production, while soil porosity is higher in comparison with the soil in the conventional system of crop cultivation (Araújo et al. 2009). Namely, the introduction of crop residues and different types of organic fertilizers improves the soil characteristics and increases its fertility, thus alleviating erosion.

In addition, the crop cultivation system has an impact on the diversity of living organisms in the soil, particularly microorganisms. Years-long experiments comparing organic and conventional cultivation of different crops have shown that diversity, activity and biomass of microorganisms are higher in organic farming than in conventional farming (Grantina et al. 2011). A larger number and diversity of microorganisms in the organic cultivation system is a result of more shallow soil tillage, introduction of a higher level of organic matter and lack of mineral fertilizers than in conventional farming (Diepeningen et al. 2006).

The methods used in organic farming, such as more intensive crop rotation, introduction of polycultures, cover cropping and others, do not have a negative impact on the environment. On the contrary, they contribute to its preservation and improvement of agro biodiversity (Roljević & Grujić 2013). Alongside soil tillage and fertilizer change, crop rotation represents the most important agro technical measure in agriculture. Crop rotation represents changing of plant species in space and time, i.e. planned growing of different crops on the same plot over time. The introduction of a larger number of species in crop rotation, i.e. the increase in biodiversity on the arable land, enables creating the communities similar to natural ones and the interactions existing in such communities. Considering the environmental protection, crop rotation has a positive impact on

soil structure, its moisture, air and temperature regimes, the balance of organic and mineral matter, as well as on the living organisms and their activities in the soil. From the economic point of view, crop rotation makes production more stable in the market, since it ensures the availability of a larger number of crops; if one fails, the next crop can have a good yield.

Introducing *intercrops* on the production areas leads to the improvement of crop rotation. An intercrop is a crop which is cultivated alongside the main crop in the inter-row spacing, and it can be successfully applied in the production of fruit, field and vegetable crops (for example, sowing maize and beans, summer barley and red clover, oat and vetch, maize and pumpkin, etc.). Intercropping leads to a more rational use of arable land, decreases the requirements of fertilizer addition and crop protection, maintains the soil moisture and improves its physical, chemical and biological characteristics.

Cultivation of *stubble crops* in field and vegetable farming can affect the general soil productivity with much lower investment. Cultivation of stubble crops most frequently requires only shallow soil tillage, which decreases work and energy consumption. Sowing stubble crops enables a more complete usage of the available farming resources, maintains soil fertility and decreases the need for agro technic measures for protection from weeds, diseases and pests.

One of the measures to establish balance in agro-ecosystems is to increase the diversity of cultivated plants. This can be obtained by cultivating *polycultures, i.e. intercropping*. Intercropping represents the cultivation of two or more crops at the same time and place. Polycultures enable optimal use of available soil resources and its protection from erosion processes, improvement of physical-chemical and biological properties of soil, increase of agro-biodiversity, alleviation of damages caused by weeds, diseases and pests and creation of socio-ecological advantages (diverse nutrition, stable production, secure income).

Cover crops represent a bioagritechnical measure and a typical example of introducing useful interrelations into the agro-ecosystem. Cultivating cover crops decreases the need for additional introduction of nutritive matter in the soil and instruments for crop protection. It also reduces the use of mechanization. These are the crop cultivars cultivated as pure crops or as a combination of several cultivated crops, with the aim of protecting the soil from the influence of agrometeorological factors, as well as from weeds.

The application of the mentioned and numerous other agri-environmental measures in organic farming enables the conservation of agro biodiversity and genetic resources, as well as the stimulation of natural processes and relationships in ecosystems (Roljević et al. 2014).

2.2. Economic and social impacts of organic farming

There are numerous and significant links between organic farming and socio-economic aspects of rural development (Table 1), but in the following text authors will analyse only aspects of organic farming to employment and generating of values in the rural economy.

Features of Rural Development	Farm Aspects and Examples
Employment	Employment of the farm family Other employees in the farm business Employment created off the farm
Generating and retaining value in the rural economy	High value products; On-farm processing; On-farm retailing; Co-operative processing/selling Diversification
Skills, knowledge and networks	Fostering of innovation; Specific product knowledge; New networks; Human capital
Community	Solidarity; Social capital; Social networks; Vibrant community life;
Environmental goods	A high quality farm environment; Aesthetic aspects of landscape

Table 1. Possible connections between characteristics of rural development and organic farming.

Source: Lobley et al. 2005, page 36.

Organic farming stimulates employment. Organic farming has a positive impact on employment in rural communities, but this issue is certainly complex and depends on many factors, such as farm size, size of organic production, degree of farmers' diversification, development of rural communities, development of the organic market products, etc. (Lobley et al. 2005, 40; Offermann & Nieberg 2000, 18-19). Additional employment in agriculture, as a result of the expansion of organic production, very often is linked to the part-time work, additional or seasonal work, which does not imply job security and sustainable rural employment, and also farms in organic farming, as well as other conventional farms, tend to increase the efficiency, and by applying modern mechanization and technology, these farms tend to reduce the amount of human labour required (Lobley et al. 2005, 22; Offermann & Nieberg 2000, 18).

How does organic farming generate value? It is important to distinguish between the two terms that are often used together, namely "processing" and "added value". "Processing" involves changing the shape of the product and transforming the raw material, while "adding value" involves adding to the product other values for which the consumer is willing to pay a higher price. Value-added products are advanced quality products, certified organic products, products with protected designation of origin, protected geographical indication, branded products, etc. (Roljević Nikolić & Paraušić, 2019; Alonso & Nortcote 2013; De Chernatony et al. 2000). Value-added projects can help farmers to stand out from the crowd, fill a specific demand and increase profits. But farmers has to note that not all products or practices are right for every farm, and farmers have to be sure that have the space, time, capital and commitment to add a specific value-added product or activity to their daily workload. Investing in organic certification make contributes product recognition, but it must be implemented systematically and throughout the entire chain of production and sales. In this way, a more secure placement is achieved, making it easier for consumers to make choices, shorten purchase time and provide greater assurance in product quality. Organic farms achieve greater sales values for their products, and the source of higher revenues is the purchasing power of upper-middle class consumers who are willing to pay a premium for organic foods (Mansury & Hara 2007, 220). Box 1 shows an example of successful organic farm in England, and their market routes.

Box1. Whiteholme Farm in England

“Whiteholme Farm is situated on the River Lyne in the North East of Cumbria (England) and is a remote upland organic livestock farm run by Jon and Lynne Perkin. As a Soil Association registered organic holding the Perkins produce beef, lamb and pork from rare breeds that are particularly suited to the upland environment of the farm, processed products such as sausages, and they also offer accommodation at the farm. There are a number of routes through which the produce of Whiteholme Farm reaches its customers. The first is the meat box scheme that the Perkins run, which parallels the more familiar vege-box scheme, except that rather than weekly deliveries, members can order to suit their needs and support the farm through regular payments. The benefit for the scheme members is priority of supply and a lower price than they otherwise might pay. Secondly, Whiteholme farm also sells its meat through farmers’ and council markets in the area. Finally, there is the facility to order meat boxes through the Farm’s website. Whiteholme offers an example of the integration of high quality food production, with environmental protection and outreach to a wide group of people who can become involved in food and farming in a new way.”

(Source: Lobley et al. 2005, 109-110)

Is organic farming more profitable than conventional farming? Organic farming has to be profitable to generate higher and new value in rural economy and contribute higher employment and overall development of local rural communities. See box 2.

Box 2. Organic farming in UK: financial motivations

“The organic farming sector in the UK has undergone a period of rapid expansion in the 1990s, followed by growing uncertainty regarding prices, markets and its future. There has been a significant outflow of farmers from organic farming from 2000 onwards, especially amongst smaller farmers. From the interviews with those leaving the sector authors discerned that economic reasons have been paramount; these have been compounded in some cases by difficulties associated with the certification process. Financial motivations to enter organic production were the most prevalent amongst the respondents, and indeed it was the failure of the farm businesses to achieve a sustainable financial position through organic production that was the principal reason why the majority of respondents left organic certification. The key financial issues were being unable to find a market for their organic produce and not being able to find price premiums sufficient to make the organic system viable”.

(Source: Harris et al. 2016, 109-110)

Although many studies show that organic farming can be as profitable as conventional, the success of each individual organic farm depends on many factors in micro and macroeconomic farm environment, as well as on numerous factors of natural, historical and cultural heritage of rural communities (Klonsky & Livingston 1994; Offermann & Nieberg 2000; Nieberg & Offermann 2003; Nemes 2009). However, in general, it can be pointed out that the profitability of organic farms depends on measures in agricultural and rural development policies, high market prices of organic food, consumer demand in the organic food market and their willingness to pay more for such food.

3. State of organic farming development in global and EU market

Although conventional farming represents the key basis of the agro-industrial sector, organic farming is increasingly becoming its significant part. According to FiBL Statistics, in 2018 globally organic production encompasses the total of 71.5 million hectares, which represents 1.5% of the global agricultural land, with the tendency of constant growth of this share (Table 2).

The global number of organic producers amounts to around 2.8 million (Table 2). Although Oceania has 50% of organic farmland, the lowest number of organic producers and processors are found in this region (Table 2). On the other hand, the largest number of organic producers (75%) was recorded in the regions of Asia and Africa.

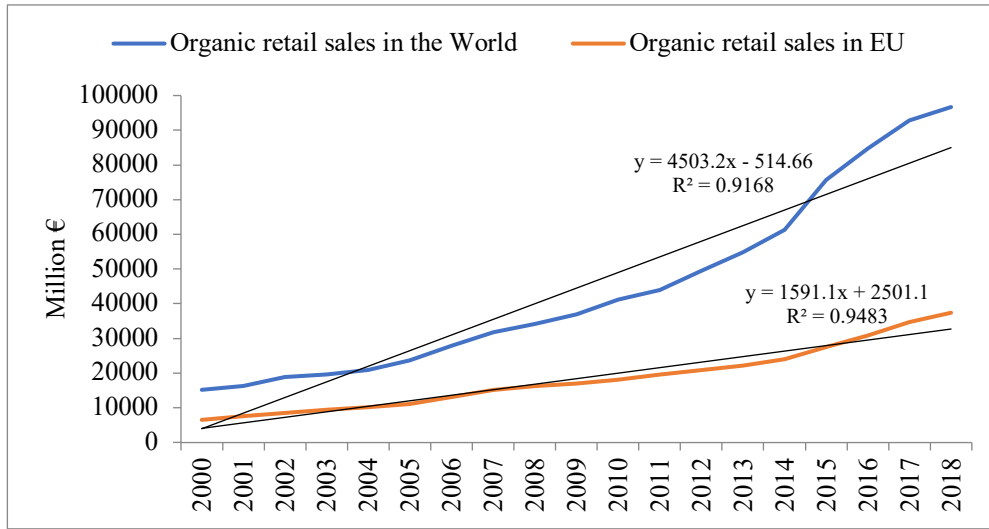
Table 2. Key indicators of organic agriculture worldwide, 2018.

Regions	Organic area, ha	Organic area, % of total farmland	Organic producers, number	Organic processors, number	Organic retail sales (million €)
Africa	1,984,132	0.2	788,858	1,693	17.1
Asia	6,537,226	0.4	1,317,023	12,787	10,070.6
Europe	15,635,505	3.1	418,610	75,569	40,729.3
EU28	13,790,384	7.7	327,222	71,960	37,412.2
Latin America	8,008,581	1.1	227,608	1,540	809.7
Northern America	3,335,002	0.8	23,957	1,720	43,677.4
Oceania	35,999,373	8.6	20,859	2,492	1,378.4
World	71,494,739	1.5	2,796,404	95,732	96,682.6

Source: FiBL Statistics. The Statistics.FiBL.org website <https://statistics.fibl.org/world.html>.

According to FiBL Statistics, globally organic retail sales is growing significantly and reached a value of € 96,682 million in 2018, which is six times more than in 2000 (€ 15.156 million) (Graph 1, Table 2). The United States (41.2%) and the EU (38.7%) account for the largest share of the organic retail sales in 2018, accounting for almost 80% of the global market. At EU level, in 2018 countries with the largest organic food market were Germany (€10,910 million), France (€9,139 million) and Italy (€3,483 million) (FiBL Statistics). The other regions witness high prices of organic products, limited availability, inadequate quality, scepticism, and lack of understanding of organic product values, which makes consumers unable to buy organic products and limits the growth of the organic product market.

Graph 1. Organic retail sales (million €) in the world and EU, 2000-2018.



Source: FiBL Statistics. The Statistics.FiBL.org website <https://statistics.fibl.org/world.html>.

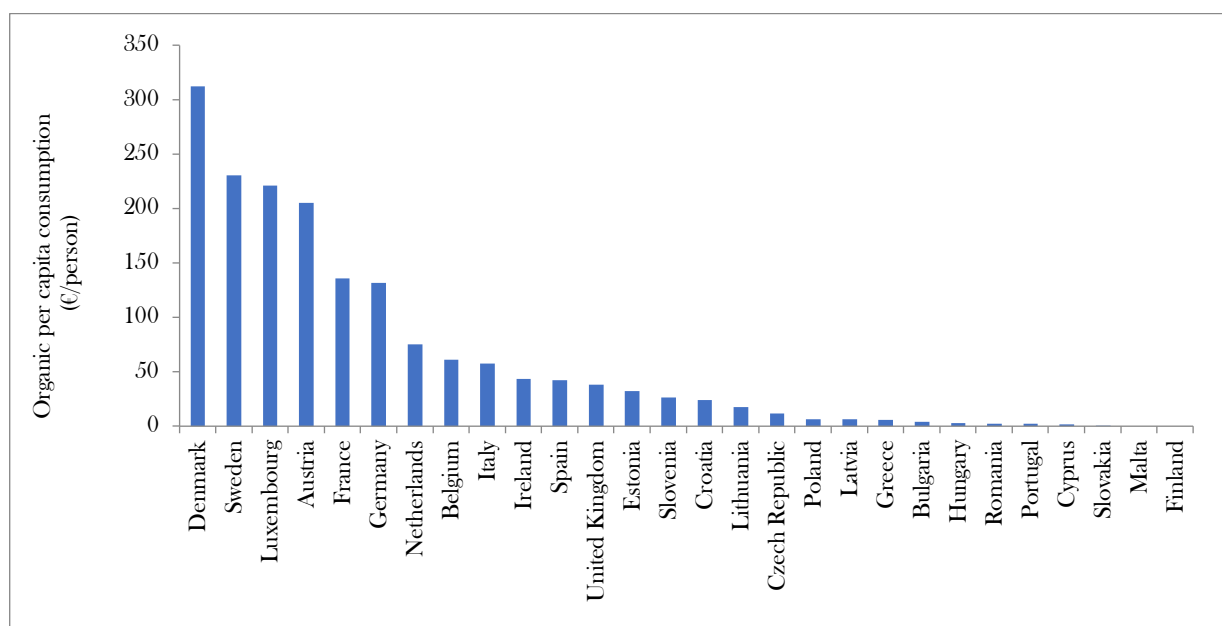
Consumers' awareness of healthy nutrition and environmental protection, the high standards, application of new agro-technological knowledge and availability of technical and technological resources have all led to the fact that the highest concentration of operators in the processing sector is in the region of Europe (Table 2). The EU countries include as much as 95% of organic processors recorded in the area of Europe (Table 2).

The organic market is gradually developed from a niche market to the mainstream and global agricultural market (Hamzaoui-Essoussi & Zahaf 2012). Statistical data show that the demand level does not represent an obstacle in the development of the organic food market, although there are significant regional differences. The demand for organic products is mostly based on the consumers' perception that organic agriculture is sustainable and that it contributes to the protection of the environment, biodiversity, animal welfare, as well as the improvement of quality and health safety of food products when compared to the intensive conventional farming (Baranski et al. 2017). Some studies have indicated the positive impact of organic food on human health. It has been determined that people who regularly consume organic food have a considerably lower risk of being overweight (Kesse-Guyot et al. 2013), and that the consumption of organic dairy products is correlated with the lower eczema risk in children until the age of two (Kummeling et al. 2008).

Regarding the average per capita consumption, the inhabitants of Denmark spent most on organic food in 2018 (312 €/person), followed by Sweden (230.7 €/person), Luxembourg (221.0 €/person) and Austria (205.2 €/person). The inhabitants of France and Germany spent more than 100 €/person. From 50 to 100 €/person was spent by people in Norway, the Netherlands, Belgium

and Italy, while in the remaining countries 50 €/person was allocated for organic products (Graph 2).

Graph 2. Organic per capita consumption (€/person) in EU28, 2018.



Source: FiBL Statistics. The Statistics.FiBL.org website, <https://statistics.fibl.org/europe/retail-sales-europe.html>.

Although Spain is among the four countries with the largest organic farming area, a large share of the products is exported. Therefore, the per capita consumption in this country is lower than in some other EU countries and it amounts to €42.2.

4. Organic farming in Serbia: an experience and practice

4.1. Serbia: basic facts and figures

Serbia is situated in central Balkans, with population of round 7 million people. The country has a long tradition in agricultural production, the necessary knowledge of agricultural producers and support institutions, favorable natural resources, which all provide great opportunities for sector's restructuring in the direction of its profitability and sustainability (Roljevic et al. 2017).

Agriculture is an important sector of economy. According to SORS database (The Statistical Office of the Republic of Serbia, database), agriculture accounting for 6.3% of GVA (Gross value added, 2018), 15.4% of total employment (Labor force survey, 2018) and 17% of export value (2019, including food products and beverages).

On the other hands, the biggest constraints for Serbia's agriculture are: current farm structure, low productivity, low level of technological progress and knowledge, low investment and high market uncertainty. First census of agriculture in Serbia, based on EU methodology, was realized in 2012, and statistical data showed that Serbia's agriculture is dominated by mixed and small farms in terms of their physical size (5.4 ha UAA/farm), and economic size (5,939 EUR/farm) (SORS database). Farm structure survey was implemented in 2018 by SORS, and the new data also confirm previous (Table 3).

In 2018, small farms with less than 5 ha of UAA make 71.7% of total farm number, and they farmed 23.2% of total UAA. On the other side, there are only 0.25% of large farms (with more than

100 ha of UAA) but they farmed almost same area of UAA, precisely 20.2% of total UAA (Farm Structure Survey, 2018).

Table 3. Basic characteristics of agricultural holdings in Serbia, FSS, 2018

Characteristic	Number/Value/ha/%
Total number of farms	564,541
Average economic size of farm (in SO, EUR)	8,610
Average physical size of farm (UAA, ha)	6.2
Farm with less than 5 ha of UAA, % of total number	71.7
Farm with more than 100 ha of UAA, % of total number	0.3
Specialized farms, % of total number	46.8

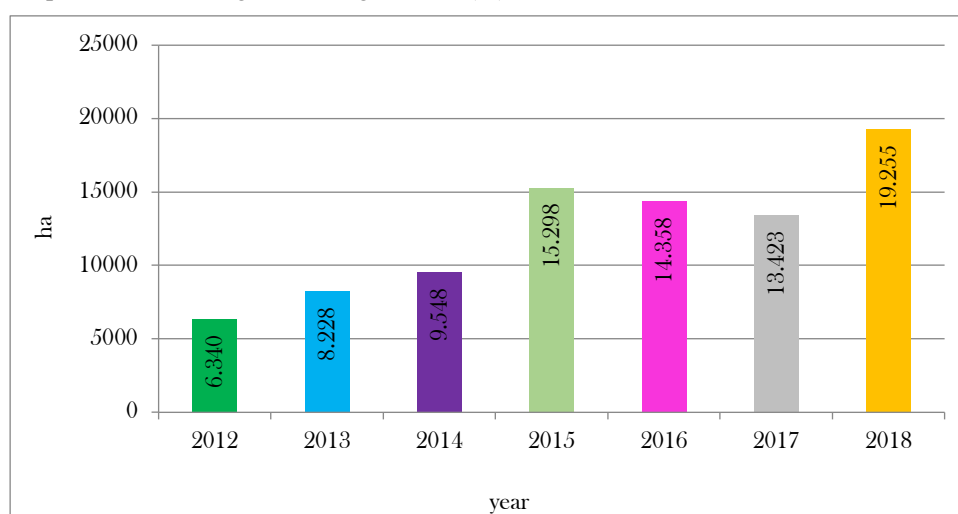
Source: Farm Structure Survey, 2018, SORS database.

4.2. Current state of organic farming development in Serbia

Law on organic production (Official Gazette RS, No. 30/10), adopted in 2010, provided the institutional framework and conditions for the operation and development of the organic farming sector in Serbia. The competent authority for organic farming is the Directorate for National Reference Laboratories (Group for organic production) which is part of the Ministry for Agriculture, Forestry and Water Management. It is obliged to keep comprehensive records on organic production, establish and maintain an efficient control system, verify organic farming methods and rules of processing in organic farming, provide expert support for making regulations and perform other jobs in the field. Also, national association “Serbia Organica” has gathered participants in organic sector and systematically improves this sector by numerous activities.

The organic farming area in Serbia covers 19,254.6 ha (Graph. 3) or 0.6% of total UAA, which is low compared to the EU, where the area under organic farming takes 7.5% of total UAA (2018). However, area under organic farming in Serbia has a continuous and high growth (more than three times in the period 2012-2018).

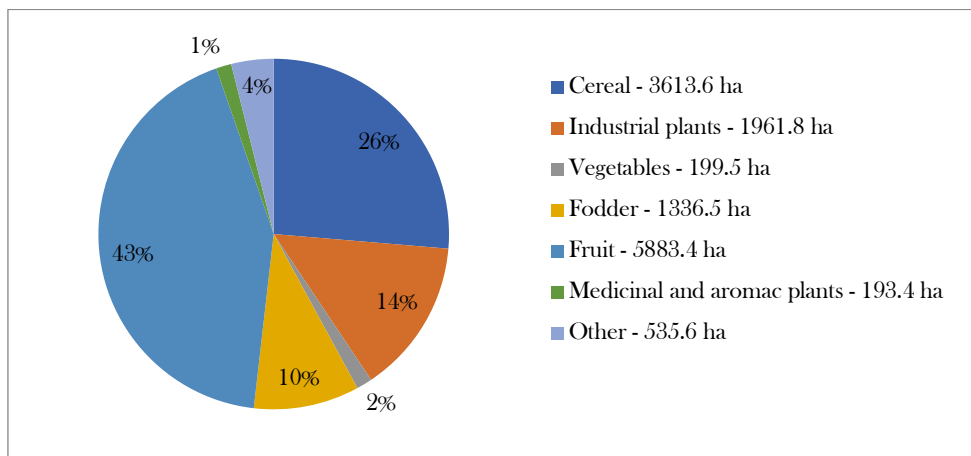
Graph 3. Area under organic farming in Serbia (ha), 2012-2018.



Source: Directorate for National Reference Laboratories, Group for organic production, Republic of Serbia Ministry of Agriculture, Forestry and Water Management, <http://www.dnrl.minpolj.gov.rs/en/organicka/organicka.html>.

In 2018, **fruit organic production** has the largest share in total arable land (43%), followed by the production of **cereals** (26%) and **industrial crops** (14%) (Graph 4).

Graph 4. Organic plant producon in Serbia, arable land, 2018.



Source: Directorate for National Reference Laboratories, Group for organic production, Republic of Serbia Ministry of Agriculture, Forestry and Water Management, http://www.dnrl.minpolj.gov.rs/en/o_nama/organska/organska.html.

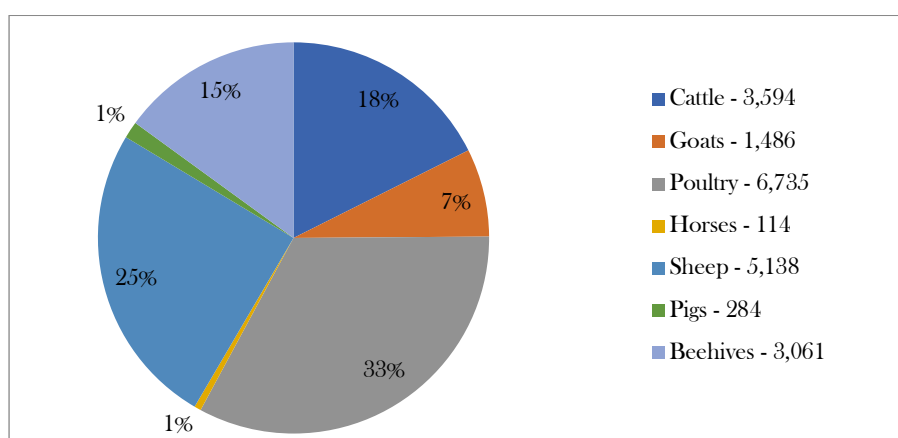
Considering the cereal production, in 2018 the most significant share of areas are the ones growing **wheat** (41.39%), while in the sector of industrial crop production it is the production of **sunflowers** (50.1%) (Directorate for National Reference Laboratories, Group for organic production).

As many as 49 vegetable cultivars are grown on the organic land, which indicates the favourable position of Serbia for growing a large number of cultivars, even without the intensive production and crop protection systems. When it comes to the organic production of vegetables, the cultivation of pumpkin is dominant, occupying 27.3% of the total area.

The areas with raspberry account for 40.5% of the areas growing organic fruit. In addition to raspberry, there is a significant production of organic apples (24.5%) and plums (14.6%).

Organic livestock production accounts for the largest number of poultry (33%), followed by sheep (25%) and cattle (18%) (Graph 5).

Graph 5. Organic animal production in Serbia, 2018.



Source: Directorate for National Reference Laboratories, Group for organic production, Republic of Serbia Ministry of Agriculture, Forestry and Water Management, http://www.dnrl.minpolj.gov.rs/en/o_nama/organska/organska.html.

In order to obtain a clear image of a country's interest in organic farming, the dynamics of the growth of organic farming areas should be analyzed along with the changes in the number of subjects included in the organic farming sector (Roljević Nikolić et al. 2017). According to the unified register of the Directorate for National Reference Laboratories, Group for organic production, for the period 2013-2018 the number of organic producers increased from 259 to 500, i.e. by 93%. The largest number of producers are in the plant production sector (359), while a significantly smaller number dealt with cattle breeding (55) and beekeeping (12). The largest number of participants in the organic food supply chain in Serbia are physical persons (about 71%).

Value of organic product export from Serbia in 2018 amounted to € 27,419,347.7, which is 2.7 times higher than in 2013 (€ 10,090,801.4). Serbia exports the largest share of organic products to the EU countries, i.e. to Germany (27%), the Netherlands (12%) and Austria (11%). Frozen raspberries account for 58% of the total organic product export in 2018, which indicates the strong potential of this fruit species in organic farming (Directorate for National Reference Laboratories, Group for organic production).

In Serbia, like in other countries, there are two certification options:

- Single producer (certificate holder is a agricultural producers/farmers), and
- Group certification, where certificate holder is a company, usually export companies (Simić 2007, 18).
- According to the farm size and type of farming, organic farms are divided into three categories:
 - Small family farms;
 - Specialized farms, and
 - Large companies that combine plant and animal production on bigger area, and often dealing with processing, which is the best business model (Ibidem, 18).

For the example of the third category of organic farm see Box 3 (An example of good practice "Global Seed" company, Vojvodina).

Box 3. An example of good practice "Global seed" company, Vojvodina

In Serbia today, organic agriculture mostly relies upon small farmers. It is still a rare thing to see larger agro-companies joining the "Green Revolution". That is why an example of a large agro-system accepting green agriculture as their general model is a significant one. Under the motto "a thousand cows on a thousand hectares" company "Global seed" from Čurug (Vojvodina) completes a full circle – they grow the crops needed for feeding the cows themselves, they have built a plant for organic feed, and organic dairy, a unique one in Serbia. Company's vision is "to become a regional leader in the production of organic milk, meat and organic cattle feed as the largest organic cow farm in Europe".

Source: Global seed company, Serbia, <http://www.globalseed.info/en/about-us.php>

The organic product market in Serbia is still insufficiently developed, with insufficiently purchasing power of consumers, although it has witnessed a significant growth in the last few years. This growth is a consequence of raising the awareness of not only consumers but also producers regarding the significance and advantages of organic production. Organic products are the most represented in large urban areas due to the higher users' purchasing power and the availability of information regarding the advantages of these products. A significant impact on the production

growth and consumption of organic food in Serbia was enabled by the availability of organic products on the shelves of retail shops of large supermarket chains.

Ministry of Agriculture Forestry and Water Management guarantees for each product bearing symbol “Organic food” (Image 1) that it’s produced in line with organic farming principles.

Image 1. “Organic food” symbol on the packaging



Source: Serbia organica. The national association for development of organic production. website: <https://serbiaorganica.info/>

Today, several business associations, clusters and NGOs participate in Serbian organic sector (Simić 2017, 25). The most important national association is "Serbia organica", Belgrade, which is umbrella association. It was founded in 2009 as a non-governmental organization with the aim of developing the organic sector, supporting all participants and with the mission "to make organic farming stable and competitive on both the national and international markets" (Serbia organica. The national association for development of organic production, website <https://serbiaorganica.info/>).

4.3. Financial support for organic farming

Organic farms need financial support to raise production, productivity and competitiveness on the national, regional, and EU markets.

The systematic and structural reformation of the agricultural sector in the Republic of Serbia started after 2000. Since then, agricultural and rural policies have passed through several phases. The passing and adoption of the Law on Subsidies on Agriculture and Rural Development (“Official Gazette RS”, No. 10/2013, 142/2014, 103/2015 and 101/2016) enabled a systematic organization of the field of subsidies in agriculture and rural development, i.e. the regulation of the types of subsidies in agriculture and rural development, requirements for exercising the rights to subsidies and using the subsidies.

Table 4. Incentives in agriculture and rural development in Serbia, 2013, 2019 and 2020.

Support measures	2013	2019	2020	2020/2013 (%)
Direct payments	242,216,864.5	162,597,659.0	155,478,986.8	- 35.8
Rural development	10,491,100.4	40,202,291.3	51,556,834.5	391.4
Organic farming, amount	1,744,559.8	918,423.6	2,969,277.3	70.2
Organic farming, % in rural development measures	16.6	2.3	5.8	
Credit support	4,361,399.5	3,401,568.8	2,545,094.8	- 41.6
Special support	4,849,876.3	1,955,902.1	1,951,239.4	- 59.8
IPARD	-	51,648,570.3	33,374,677.0	-
Total	261,919,240.7	259,805,991.5	244,906,832.6	- 6.5

Source: Regulation on the allocation of subsidies in agriculture and rural development in 2013, 2019 and 2020; the exchange rate of euro formed on March 25, 2020, December 31 for the year of 2020, 2019 and 2013, according to the author’s calculations

In 2020, comparing with 2013, state incentives in organic sector are higher, but share of organic farming support in total rural development funds is less (Table 4).

The currently valid Rulebook on use of subsidies for organic crop production (“Official Gazette RS” Nos. 31/18 and 23/19 and 20/20) and Rulebook on the use of subsidies for organic livestock production (“Official Gazette RS” Nos. 41/2017, 3/2018, 31/18) provide the following types of incentives to farmers in Serbia:

- Subsidies for organic plant production are higher for 400% in comparison with the amount of the basic subsidies for plant production;
- Subsidies for organic cattle production are higher for 40% than the amount of the corresponding type of direct payments in cattle breeding;
- The right to the subsidies can be exercised by: a legal entity, an entrepreneur or a natural person – the owner of a commercial family agricultural holding fulfilling specific requirements related to dealing with organic production.

Additional support for agriculture and rural development is IPARD fund. These resources are gradually increasing, and the support for agro-ecological measures will have a significant share in them.

4.4. Current problem and challenges

In general, "the greatest constraints faced by poor farmers on the road to organic agriculture are lack of knowledge, access to markets, certification, agricultural inputs, and lack of organization" (Kilcher 2007, 48).

In Serbia "organic agriculture finds it hard to achieve a satisfactory level of growth despite great potential and steady growth of main parameters" (Simić 2017, 9), especially, seeing some attitudes that "organic sector itself is industrializing and globalizing at a rapid pace" (Guthman, 2014, 2).

Obstacles for organic sector development in Serbia are numerous (Simić 2017; Roljević et al. 2017; Djelić et al. 2019), and some of them are:

- lack of financial resources to start a business or increase investment at the all levels of the value chain;
- disorganization of participants in the value chain;
- insufficiently developed activities of sales, marketing, and processing;
- insufficiently purchasing power of consumers;
- low level of productivity;
- lack of effects of economies of scale and high production cost;
- high cost of certification;
- insufficient knowledge of the market, and
- incomplete market supply with seed and planting material, biological plant for protection products, organic fertilizers and compost, etc.

Also, there is also lack of resources required for work of associations and national NGOs. In general, there are numerous agriculture associations and clusters in Serbia, but they are all insufficiently developed and faced with many problems in their functioning, related to the sources and amount of financing, knowledge, management, etc. (Paraušić et al. 2017, 295; Paraušić 2018, 44; Paraušić & Domazet 2018, 1163; Simić 2017, 23).

Serbian government and donators intend to continue supporting of Serbian organic farming through the financial, institutional and educational support in production and processing on the level of farm, as well as on the level of associations and cooperatives (Simić 2017). At the same

time, Serbian producers have to find opportunities to development organic sector in products like GMOfree soybeans, and sectors of fruits, vegetables, oilseeds and cereals (Ibidem, 56).

5. Conclusion

Since the greatest share of natural resources is in rural areas, the expansion of ecological systems of food production considerably contributes to the revitalization of villages and stimulates rural development. The contribution of organic agriculture to the overall sustainable rural development is reflected on several way: (1) in the promotion of the rural area diversity, preserving and protection the environment, while producing quality and safe food; (2) in labour market development (organic farming has a positive impact on employment in rural communities, but this issue is complex and depends on many factors); (3) in generating of values in the rural economy (certified organic products are also value-added products). Organic farming has to be profitable to generate higher and new value in rural economy and contribute higher employment and overall development of local rural communities. Although many studies show that organic farming can be as profitable as conventional, the success of each individual organic farm depends on many factors in micro and macroeconomic farm environment, as well as on numerous factors of natural, historical and cultural heritage of rural communities. However, in general, it can be pointed out that profitability of organic farms depends on measures in agricultural and rural development policies, market prices of organic food, consumer demand and their willingness to pay more for organic food.

In case of Serbia, the organic farming area is only 0.6% of total UAA (2018), which is low compared to the EU (7.5% of total UAA, 2018), but area under organic farming has a continuous and high growth. Fruit organic production has the largest share in total arable land (43%), followed by the production of cereals (26%) and industrial crops (14%).

Even though the organic product market in Serbia is still insufficiently developed, this is growing sector of the Serbian agriculture. A significant impact on the production growth and consumption of organic food in Serbia was enabled by the availability of organic products on the shelves of retail shops of large supermarket chains. Organic products are the most represented in large urban areas due to the higher users' purchasing power and the availability of information regarding the advantages of these products.

Obstacles for future organic sector development in Serbia are numerous, and some of them are: lack of financial resources to start a business or increase investment at the all levels of the value chain; disorganization of participants in the value chain; insufficiently developed activities of sales, marketing, and processing; low level of productivity; lack of effects of economies of scale and high cost of production; high cost of certification; incomplete market supply with seed and planting material, biological plant for protection products, organic fertilizers and compost, etc. Also, there is also lack of resources required for work of associations and national NGOs.

Serbian government and donators intend to continue supporting of Serbian organic farming through the financial, institutional and educational support in production and processing on the level of farm, as well as on the level of associations and cooperatives. At the same time, Serbian producers have to find opportunities to development organic sector in products like GMOfree soybeans, and sectors of fruits, vegetables, oilseeds and cereals.

References

1. Alonso A. D. & Nortcote J. 2013. Investigating farmers' involvement in value-added activities, *British Food Journal*. Vol. 115 No. 10, 1407-1427.

2. Araújo A. S., Leite L. F., Santos V. B. & Carneiro R. F. 2009. Soil microbial activity in conventional and organic agricultural systems. *Sustainability*, 1(2): 268- 276.
3. Baker S. & Mehmood A. 2015. Social innovation and the governance of sustainable places. *Local Environment*, 20(3): 321-334.
4. Barański M., Rempelos L., Iversen P. O. & Leifert C. 2017. Effects of organic food consumption on human health; the jury is still out!. *Food & nutrition research*, 61(1): 1287333.
5. Council Regulation (EC) No 834/2007 of 28 June 2007 on organic production and labelling of organic products and repealing Regulation (EEC) No 2092/91.
6. De Chernatony L, Harris F. & Dall’Olmo Riley F. 2000. Added value: its nature, roles and sustainability. *European Journal of Marketing* Vol. 34 No. ½, 39-56.
7. Diepeningen A. D., De Vos O. J., Korthals G. W. & Van Bruggen A. H. 2006. Effects of organic versus conventional management on chemical and biological parameters in agricultural soils. *Applied Soil Ecology*, 31(1): 120-135.
8. Directorate for National Reference Laboratories, Group for organic production. Republic of Serbia Ministry of Agriculture, Forestry and Water Management, http://www.dnrl.minpolj.gov.rs/en/o_nama/organska/organska.html, last entry 01-15.02.2020.
9. Djelić, A. T., Neskovic, S., Ketin, S., Lutovac, M., Popovic, Z., Mirkovic, M., & Secerov, P. 2019. Economic and Environmental Context of Organic Agriculture and Farms in Serbia-Case Study. *Fresenius Environmental Bulletin*, 28(1), 87-92.
10. Farm Structure Survey, 2018. SORS database, <https://www.stat.gov.rs/oblasti/poljoprivreda-sumarstvo-i-ribarstvo/anketaostrukturipopgazdinstava/>, last entry 01-25.03.2020.
11. FiBL Statistics. The Statistics.FiBL.org website, <https://statistics.fibl.org/europe/retail-sales-europe.html>, last entry 23-30.04.2020.
12. Grantina L., Kenigsvalde K., Eze D., Zaiga P., Skrabule I., Rostoks N. & Nikolajeva V. 2011. Impact of six-year-long organic cropping on soil microorganisms and crop disease suppressiveness. *Žemdirbystė=Agriculture*, 98(4): 399–408.
13. Guthman J. 2014. *Agrarian dreams: The paradox of organic farming in California* (Vol. 11). University of California Press Oakland, California.
14. Global seed company, Serbia, <http://www.globalseed.info/en/about-us.php>, access 05.02.2020.
15. Hamzaoui-Essoussi L. & Zahaf, M. 2012. The Organic Food Market: Opportunities and Challenges, *Organic Food and Agriculture - New Trends and Developments in the Social Sciences*, Matthew Reed (Ed.), 63-82., InTech, Rijeka, Retrieved from: <http://www.intechopen.com/books/organic-foodandagriculture-new-trends-and-developments-in-the-social-sciences/theorganic-food-market-opportunities-andchallenges>, last entry 01-15.02.2020.
16. Harris F., Robinson G. M., & Griffiths I. 2016. A study of the motivations and influences on farmers’ decisions to leave the organic farming sector in the United Kingdom. In *Sustainable rural systems. Sustainable Agriculture and Rural Communities* (editor Guy Robinson), Routledge, pp. 115-128.
17. Kesse-Guyot E., Peneau S., Mejean C., de Edelenyi F. S., Galan P., Hercberg S. & Lairon D. 2013. Profiles of organic food consumers in a large sample of French adults: results from the Nutrinet-Sante cohort study. *PloS one*, 8(10).
18. Kilcher L. 2007. How organic agriculture contributes to sustainable development. *Journal of Agricultural Research in the Tropics and Subtropics*, Supplement, 89, 31-49.
19. Klonsky K., & Livingston P. 1994. Alternative systems aim to reduce inputs, maintain profits. *California Agriculture*, 48(5), 34-42. <http://calag.ucanr.edu/Archive/?article=ca.v048n05p34>.
20. Kummeling I., Thijs C. & Huber M. 2008. Consumption of organic foods and risk of atopic disease during the first 2 years of life in the Netherlands. *Br J Nutr.*, 99: 598–605.
21. Law on Organic Production, “Official Gazette RS”, No. 30/10.

22. Law on Subsidies on Agriculture and Rural Development (Official Gazette 10/13, 142/14, 103/15, 101/16).
23. Lobley M., Reed M., Butler A., Courtney P. & Warren M. 2005. The Impact of Organic Farming on the Rural Economy in England. Final Report to DEFRA. Centre for Rural Research, University of Exeter. Available at <http://eprints.glos.ac.uk/2634/1/The%20Impact%20of%20Organic%20Farming%20on%20the%20Rural%20Economy.pdf>.
24. Lobley M., Butler A. & Reed M. 2009. The contribution of organic farming to rural development: An exploration of the socio-economic linkages of organic and non-organic farms in England. *Land use policy*, 26(3), 723-735.
25. Mansury Y. & Hara T. 2007. The regional impact of promoting agritourism as a sustainable strategy for rural economic development. *Journal of Regional Analysis & Policy*, 37(3), 213-222.
26. Mzoughi N. 2011. Farmers' adoption of integrated crop protection and organic farming: Do moral and social concerns matter? *Ecological Economics*, 70(8), 1536-1545.
27. Nemes N. 2009. Comparative analysis of organic and non-organic farming systems: A critical assessment of farm profitability. Food and Agriculture Organization of the United Nations, Rome.
28. Nieberg H. & Offermann F. 2003. The profitability of organic farming in Europe in *Organic agriculture: sustainability, markets and policies*. Organisation for Economic Co-operation and Development. OECD, 2003, pp. 141-152.
29. Offermann F. & Nieberg H. 2000. Economic performance of organic farms in Europe. Vol. 5 *Organic Farming in Europe: Economics and Policy*. University of Hohenheim, Department of Farm Economics, Stuttgart Germany.
30. Paraušić V., Domazet I. & Simeunović I. 2017. Analysis of the relationship between the stage of economic development and the state of cluster development. *Argumenta Oeconomica*, 39(2), 279-305.
31. Paraušić V. 2018. Značaj i uloga udruženja poljoprivrednika u Srbiji/Importance and role of association in Serbian agriculture. *Agroekonomika* 47 (80): 43-51.
32. Paraušić V. & Domazet I. 2018. Cluster Development and Innovative Potential in Serbian Agriculture. *Ekonomika poljoprivrede*, 3, 1159-1170.
33. Poláková J., Keenleyside, C. & Menadue, H. 2013. Contribution of the organic farming legislation to the sustainable development of the organic farming sector, in *Evaluation of the EU legislation on organic farming*. Braunschweig: Thünen Institute of Farm Economics, Sanders, J. (ed.), 255-270.
34. Pugliese P. 2001. Organic farming and sustainable rural development: A multifaceted and promising convergence. *Sociologia ruralis*, 41(1), 112-130.
35. Roljević Nikolić S., Paraušić V. 2019. Diversifying the Rural Economy: Institutional Framework and National Incentives in the Agricultural Processing Sector in Serbia, *Improving Knowledge Transfer to Obtain Safe and Competitive Agricultural Products Obtained by Processing on Smallholdings in the Milk, Meat, Fruits and Vegetables Sectors*. Kovacević V. (ed), Institute of Agricultural Economics - Belgrade, p. 7-22.
36. Roljević Nikolić S., Vuković P. & Grujić B. 2017. Measures to support the development of organic farming in the EU and Serbia. *Economics of Agriculture*. LXIV(1): 323-337.
37. Roljević S. & Grujić B. 2013. Productivity of old type and grains of genetic resources preservation. Thematic proceedings of International Scientific Conference „Sustainable agriculture and rural development in terms of the Republic of Serbia strategic goals realization within the Danube region - achieving regional competitiveness“. December, 5-7th 2013, Topola, Institute of agricultural economics Belgrade, Editors: Prof. Drago Cvijanović, Ph.D., Jonel Subić, Ph.D., Andrei Jean Vasile, Ph.D., pp. 1230-1247.
38. Roljević S., Hamović V. & Sarić R. 2009a. Organic agriculture in the function of sustainable development. *Economic Themes*, 3: 99-109.

39. Roljević S., Sarić R. & Vuković, P. 2009b. Significance and application of biological measures of combat in the concept of sustainable agriculture. *Economics of Agriculture*, 4: 617-626.
40. Roljević S., Vuković P. & Grujić B. 2014. The role of organic agriculture in the conservation of genetic resources and increasing agrodiversity. *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, 14(2) 241-246.
41. Regulation on the allocation of subsidies in agriculture and rural development in 2013 (“Official Gazette RS”, no 20/13).
42. Regulation on the allocation of subsidies in agriculture and rural development in 2019 (“Official Gazette RS”, no. 3/2019 i 12/2019).
43. Regulation on the allocation of subsidies in agriculture and rural development in 2020 (“Official Gazette RS”, no. 1/20).
44. Rule book on use of subsidies for organic crop production (“Official Gazette RS” No. 31/18, 23/19, 20/20).
45. Rule book on the use of subsidies for organic livestock production (“Official Gazette RS” No. 41/2017, 3/2018, 31/18).
46. Simić Ivana. 2017. Organic Agriculture in Serbia. At a Glance 2017. National Association Serbia Organica, available at <https://serbiaorganica.info/wp-content/uploads/2019/01/Organic-Agriculture-in-Serbia-At-a-glance-2017-1.pdf>.
47. Serbia organica. The national association for development of organic production, website <https://serbiaorganica.info/>. access 10.02.2020.
48. SORS database (Statistical Office of the Republic of Serbia), <https://data.stat.gov.rs/?caller=SDDDB&languageCode=en-US>, last entry 01-15.03.2020.

Appendix – Definitions of key terms

sustainable development – Modern society is already confronted with a responsibility to bring its development in line with the needs of humans and nature and with the awareness that the Earth must be preserved, for both the present generation and future generations. The obligation of today's generation to give offspring at least as much chance of development as it has, so that all people have equal rights to the broadest basic freedoms. The concept of sustainable development implies balanced economic, social and cultural development without endangering the environment. The Sustainable Development concept gained full recognition at the UN Conference on Environment and Development in Rio de Janeiro in 1992, where it was clearly emphasized that environmental protection must be an integral part of overall human development. Accordingly, every activity must, when planning and making decisions, take the utmost account of environmental requirements in order for its development to be sustainable.

rural development – The term of "rural development" means the integral and cross-sectoral development of rural areas, which in itself contains the connotation of "sustainable". First of all, it involves improving the quality of life in rural areas, primary by investing in overall infrastructure, and also the economic well-being of people living in those areas. An integrated and cross-sectoral approach of rural development is very important. With that being said, these areas face several problems, such as depopulation, population aging, landscape fossilization and generally deteriorating of almost all socio-economic indicators, which make rural areas passive and undesirable, especially for young people. Hence, the diversification of rural population activities outside of the primary agricultural production is a generally accepted model of sustainable socio-economic growth and development of rural areas. Having in mind that rural areas are significantly different in terms of natural, historical, economic and cultural heritage, it is necessary to develop local, regional and national rural development programs adapted to the needs and development goals of each area.

organic farming – The need for a healthier environment and the many negatives caused by conventional agriculture have led to alternative directions for agricultural development, among which are ecological systems such as organic farming. Organic agriculture combines the principles of ecology and agriculture and ensures the sustainability and efficiency of agroecosystems. It is based on ethical principles such as health, ecology, equity and care while effectively addressing environmental issues, all for the better quality of life of people and the development of a rural economy. According to FAO/WHO, organic agriculture represents a holistic production management system which enhances the ecosystem health, including biological cycles and soil biological activity. Organic agriculture relies on creating and maintaining the conditions which have a positive impact on the ecosystem health and encouraging natural processes instead of using artificial inputs.

organic market – It is a place where stakeholders, first of all, food retailers, farmers, and buyers (consumers), gather to exchange goods and services in sector of organic food production. The market also brings together numerous associations in the organic production and consumption, certification bodies, research and marketing organizations, suppliers of key inputs, technology and services, policymakers, etc. It can be in form of shops or markets in the physical sense, or online market in the virtual case. Also, it can be local, regional and global. The main characteristics of the market that are most often examined are: size or capacity of supply and demand, market prices, trends and growth rates of production and consumption, etc.

practices which protect the environment preserve biodiversity and natural resources – Organic agriculture significantly reduces the use of synthetic pesticides and fertilizers. In this way, it allows natural laws to spontaneously increase the yields and resistance of cultivated plants to diseases and pests, and as a final product healthy food is obtained. This type of production is based on the proper rotation of crops, soil fertility is increased by fertilizers of animal origin, legumes, fertilizers, waste materials from livestock production, mechanical processing, microbiological fertilizers, and crop protection against pest infestation, disease and severe weeds are dealt with by biological pesticides. All these components help to maintain the natural productivity of the soil and secure the supply of the plant with nutrients.

Ch. 3.4

ORGANIC FARMING AND SUSTAINABLE DEVELOPMENT OF RURAL AREAS: A CASE STUDY OF SERBIA

OBJECTIVES:

The purpose of this chapter is introducing students to all implications and impact of organic agriculture to sustainable development of rural communities.

SKILLS: Students have acquired knowledge in organic farming, sustainable rural development, and market challenges in organic sector on the level of Serbia, EU and world.

QUESTION 1 (PLEASE CHECK THE CORRECT ANSWER)

How does organic agriculture contribute rural areas development?

- By using incentives designed for organic production
- By reducing consumption of fertilizers and pesticides
- By promoting the diversity of rural areas, diversifying activities, employing and developing of human capital in rural areas
- By introducing traditional knowledge and modern agro ecological research

QUESTION 2 (PLEASE CHECK THE CORRECT ANSWER)

How does organic farming contribute diversity in agro-ecosystems?

- By reducing the use of agrochemicals
- Growing crops on small areas
- By preserving and improving the quality of the land
- By using more species and old varieties adapted to the local ecosystem, as well as introducing agro-ecological measures in the production process

QUESTION 3 (PLEASE CHECK THE CORRECT ANSWER)

What does determinate economic viability of organic farms?

- Support payments only
- Consumer demand and market prices
- High yields
- Design of agricultural support, consumer demand and market prices and existence of an adequate marketing structure for organic products

QUESTION 4 (PLEASE CHECK THE CORRECT ANSWER)

What are constraints for organic farming development in poor countries?

- Because of the dominance of small farms, there is no ability to use advantage of the economy of scale effects
- Lack of knowledge, agricultural inputs and organization; access to markets; certification; financial constraint
- Unfavorable agro-ecological conditions
- Climate changes

QUESTION 5 (PLEASE CHECK THE CORRECT ANSWER)

To generate sustainable rural development organic farming has to be:

- Profitable (able to covers costs and gives the producer a favorable return that allows him a decent living standard)
- In a line with ecological principles of farming
- It must covered high percent of utilized agricultural area
- It must be export oriented

PRACTICAL APPLICATION OF THE PREVIOUS CHAPTER (E.G., SOLVE THE PROPER TASK OR WRITE THE SIMULATION OF CERTAIN SITUATION/DESCRIBE THE NOTICED PROBLEM, ETC.)

IS IT POSSIBLE TO DEVELOP THE ORGANIC PRODUCTION SECTOR AND INCREASE EMPLOYMENT IN RURAL COMMUNITIES ONLY BY HIGHER AGRICULTURAL INCENTIVES IN THE ORGANIC SECTOR?