

Opportunities for the development of organic agriculture in the countries of the Western Balkans

Mogućnosti razvoja organske poljoprivrede u zemljama Zapadnog Balkana

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Abstract: Bioeconomy and ecology are indivisible, but investors are not always interested in the humane aspects of the economy, i.e. organic agriculture, however organic agriculture in Western Balkans is growing. This case study presents the results for selected countries: Serbia, Bulgaria (EU), Croatia (EU) and Montenegro. The goal of this work is to investigate perspectives of organic agriculture development and certification. In first section, is analyzed the present time situation in organic production and certification. In section two are presented results on growing of organic agriculture land and organic shares.

Keywords: Organic Production, Green Economy, Comparative Analysis, Western Balkans, Certification.

Sažetak: Bioekonomija i ekologija su nedeljive, ali investiture ne zanimaju uvek humani aspekti privrede, odnosno organska poljoprivreda, međutim organska poljoprivreda na Zapadnom Balkanu raste. Ova studija slučaja predstavlja rezultate za odabrane zemlje: Srbiju, Bugarsku (EU), Hrvatsku (EU) i Crnu Goru. Cilj ovog rada je da se istraže perspektive razvoja organske poljoprivrede i sertifikacija. U prvom delu, analizirana je trenutna situacija u organskoj proizvodnji i sertifikacija. U drugom delu su predstavljeni rezultati rasta organskog zemljišta i udeo organske proizvodnje.

Ključne reči: Organska poljoprivreda, zelena ekonomija, komparativna analiza, Zapadni Balkan, sertifikacija.

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INTRODUCTION

Organic agriculture contributes preservation of natural resources, primarily water and soil. It is consistent with bioeconomy activities because it supports the use of available resources and it subordinates economic growth to this goal. Organic agriculture represents a system of sustainable agriculture, largely based on local resources, which maintains ecological balance and minimizes the negative impact of agriculture on the environment.

Also, it implies production in accordance with the law and standards defined conditions with control of the entire production cycle by an authorized organization for certification. The development of organic agriculture: provides assistance in the preservation of the human environment and in this sense leaves an enviable legacy for future generations, it contributes to more proper nutrition of the population and the preservation of human health, it contributes to the development of rural communities and the red-

uction of negative demographic trends. In current conditions of man-made transformation of nature, the principle adequacy of the materials and technologies used to productivity and resources of the biosphere is of cardinal importance (Ermakov, Jovanović, 2023). In organic agriculture development, one of the main factors is the soil condition. Future solutions are also found in the organization of an organic agricultural systems with competitive productivity. Organic production is a very specific type of agriculture, basically the opposite of conventional agriculture, given that it is strongly ecologically oriented, expresses concern for the preservation of the environment, natural resources and biological diversity, emphasizes the use of natural materials and respect for the biological processes of plant growth and development and animals raised as part of agricultural activity (Ristić et al., 2023). Challenges facing agriculture and food production look huge (Janković et al., 2023). Future solutions are found in the organization of organic agricultural systems with competitive productivity. It is generally known that producers that use modern strategies can play an important role in solving environmental problems (Čajka, Jovanović, 2014). Contemporary aspirations in agriculture inevitably imply the development of an ever-increasing share of organic agriculture in total agricultural production and a management in a way that will ensure precaution and responsibility in order to protect the health and well-being of current and future generations and the environment (Willer et al., 2023).

Organic sector of production in Serbia is under development. As a developing country Serbia could spot an opportunity for agricultural development. Agricultural and food products represent the basis of population's nutrition (Dašić et al., 2022). The production of food products exclusively from ingredients that are not harmful to the health of consumers is the surest guarantee of food health safety (Jovanović et al., 2007). Main task of the agricultural production is to provide sufficient amounts of food for the population (Vlahović, 2015), but in order to ensure safety and the future of nutrition, it is necessary to take measures that prevent further degradation of fertile soil. Apart from the quality and volume of production, certification also plays an important role. Bulgaria and Croatia, as EU members, have implemented and use EU regulations, while Serbia and Montenegro, which are candidates for membership in terms of certification, have their own regulations.

1. MATERIALS AND METHODS

The starting point of the research is the analytical method, which extracted components such as the number of organic producers, processors, data on regulation and labeling, shares of organic production, etc. through indicators of FiBL & IFOAM – Organics International (2023): *The World of Organic Agriculture* (Willer et al., 2023), also involved official statistical data and consulted number of scientific and professional articles and studies turned to organic agriculture. These data were systematized for each country and then, using the method of comparative analysis, comparisons of characteristics and mutual relations were made. By continuing the research, we used a synthesis. The positions of all analyzed states to observed field have been determined.

2. RESULTS AND DISCUSSION

Certification of organic production enables countries to develop the sector. While Bulgaria and Croatia, in addition to national regulations on organic agriculture, fully implement mandatory EU regulations – European Union of Regulation 848/2018 (EU Reg), Serbia and Montenegro has introduced regulations at the national level which are fully implemented regulation on organic agriculture.

Authors Agapiova-Aliosman & Dirimanova emphasizes a clear policy, goals and management strategies are needed in the organic and agricultural sector in Bulgaria (Agapieva-Aliosman, Dirimanova, 2021), main domestic regulative in Bulgaria is based on National Plan for Development of Organic Farming in Bulgaria 2007-2013 (Bulgarian Ministry of Agriculture Food and Forestry, 2013) (which is outdated) but nowadays all efforts are to use European regulations and private standards. Croatia has withdrawn its law and also uses EU regulations from 2013. All countries have a system of domestic and/or international regulations (Table 1).





All selected countries in this case-study have established an official labeling system as it shows Table 2 for certified organic products, which is implemented through the marking of products that meet the requirements. Labeling is important on the market of organic products because it separates products resulting from the use of organic production practices that foster and preserve natural balance. Bulgaria and Croatia have a domestic mark of organic production, but also use one that is common to EU regulations, while Serbia and Montenegro use domestic product labeling systems.

Table 1 - System of legal frameworks in organic production in selected countries

Country	Domestic legal framework	Relevant authority	International legal framework	In use
Serbia	Law on organic production, Official Gazette of Republic of Serbia, 30/2010 & 17/2019	Ministry of agriculture, forestry and water management	-	Domestic
Bulgaria	National Plan for Delopment of Organic Farming in Bulgaria 2007-2013 (former)	Bulgarian Ministry of Agriculture, Food and Forestry	Eu Reg Action plan for organic production in the European Union 2021-2027	International
Croatia	Law on organic production and labeling of organic products (former) No139/2010	Republic of Croatia Ministry of Agriculture	Eu Reg Action plan for organic production in the European Union 2021- 2027	International
Montenegro	Law on Organic Production, Official Gazette of Montenegro, No. 56/2013	Ministry of agriculture, forestry and water management	-	Domestic

Source: Author's systematization

Table 2 - Official organic product symbols in selected countries

Country	Official organic product symbols
Serbia	
Bulgaria	
Croatia	
Montenegro	

Source: Author's systematization

Table 3 - Control bodies and control authorities in the organic sector in selected countries

Country	Number of bodies and authorities	Relevant authority
Serbia	6	ATS (Accreditation Body of Serbia)
Bulgaria	17	EC (European Commission)
Croatia	11	EC (European Commission)
Montenegro	1	Accreditation body of Montenegro

Source: Author's research

Control and certification of organic production in the Republic of Serbia is carried out by authorized control organizations. Authorized control organizations are independent legal entities authorized by the competent Ministry to carry out control and certification of organic production and accredited by ATS (Accreditation Body of Serbia) (<https://serbiaorganica.org>). In Serbia in 2023 there are 6 such organizations: Ecocert Balkan, Centar za ispitivanje namirnica, Organic Control System, TMS Cee, Ecovivendi and SGS. In the European Union, the control bodies are under the supervision of the European Commission, which maintains the data register, according to their report. Bulgaria has 17 control organizations: Balkan Biocert, Q Certification, CERES, Lacon, Control Union Certifications, Bio Hellas, Ecogruppo Italia, Bioagrocert Italia Bulgaria, SGS Bulgaria, Bulgarkontrola, Austria Bio Garantie, Agency for organic certification, Makom Certification, Agro Organic Control, Bio Certification and Nutramed. In Croatia operates 11 control organizations: Bioinspekt, Prva ekološka stanica, Zadruga Agribiocert, Biotechnicon, Hrvatske šume, Trgo-invest, Austria Bio Garantie, Bureau Veritas, Eurotalus, Eko Razvoj and Zavod za javno zdravlje Dr. Andrija Štampar. There is only one certification body in Montenegro. Monteorganica is an accredited certification body for control and certification in organic agriculture according to the

requirements, issued by the accreditation body that deals with the affairs of the Ministry of Agriculture and Water Administration of Montenegro. The Monteorganica certification body's compliance with the MEST EN ISO/IEC 17065:2013 standard is assessed by the Accreditation Body of Montenegro.

In the field of organic product types, according to authors research (Table 4), Serbia mainly has the production of fruits, with a part of frozen, deep frozen, dried and lyophilized fruit production 458 producers of which 149 are engaged in processing too. The research data indicate that producers are currently focused on the following species: raspberries (from Arilje region), strawberries and berry fruits, wild and forest strawberries, blackberries, wild blackberries, blueberries, apples, plums, rosehips and elder-flower and elderberries. Producers also export vegetables, grain, legumes and oilseeds, as well as honey and bee products. The production of organic meat is also under development, which is the case with the Bio Panon farm in the north of the country (in Vojvodina) and similar farms that produce organic meat (beef and chicken) and dairy products. In Serbia, cases of group organization of production have been noticed. Associated production is important because it increases market opportunities for organic producers. Top 10 producers of 2022 in cooperative production shows Table 4.

Table 4 - Producers in cooperative organic production with number of cooperants

Associate producer	Number of cooperants	Products
Zadruagar doo	763	Frozen fruits
Fortis doo	742	Fast frozen fruits
Frikos doo	577	Frozen and lyophilized fruit
Midi Organic doo	441	Fruits
Agrofrust doo	395	Raspberry
Menex doo	367	Berries and forest fruits
Nectar doo	274	Organic fruits for juices
Agro Domestica doo	224	Livestock production
Minar Frucht doo	180	Fruits, wild fruits, mushrooms
Jezdimirović doo	153	Frozen fruits

Source: Author's research

Bulgarian organic production is primarily based on honey and bee products: Acacia, Wildflower, Lavender, Black Forest and Linden Honey with

organic certification (Bulgarian Nuts Co., Bilbo Varna, Amerov Honey Ignatievo etc.), but Bulgarian rose products are also represented (rose water, rose

oil) and other aromatic plants. In addition, organic seeds and cereals (sunflower, flax, spelled) are produced in Bulgaria.

In Croatia, there are farms that produce several types of grains and vegetables (for example, Zrno Eko Imanje Dubrava near Zagreb), which has 60 vegetable, field and spice crops in its production, but the main product is certainly organic olive oil, for which the coast of the Adriatic Sea (example Terra Rossa from Sveta Katarina) is known, as well islands. An interesting example is also the “Šoltansko super organic” olive oil, which was awarded in Tokyo, New York and Dubai. Olive oil under a unique name is produced by small local producers from the island Šolta.

In Montenegro an important feature of current organic production is that it is fragmented. Organic production is quite scattered and diverse and producers of small quantities are characteristic such as individual agricultural holdings that mostly cover

local market requirements. There is no good practice of the association of small producers as in Croatia or Serbia. Vegetables (potatoes, beets, carrots), fruits and forest fruits (apples, plums, aronia, pears, blueberries), then figs and pomegranates (local potential), honey, cereals as well as lambs and sheep are grown. According to the data of the certification body Monteorganica for 2021 production is based on vegetable with 424 producers, of which 371 produce fruit, 63 agricultural crops and medicinal plants, 10 vegetable crops, a 3 producers collect forest fruits and medicinal herbs. Livestock production is engaged in 64 producers, of which 56 have beehives. 27 deals with the processing of organic products manufacturer, from which stand out: IN-SPE is the organic producer in regarding the collection of wild plants and production organic tea and the largest farm in Montenegro is HM Durmitor (Izveštaj o organskoj poljoprivredi, 2022).

Table 5 - Comparative analysis of organic products and producers production in selected countries

Country	Enterprise	Products
Serbia	Minex, Kruševac Master food, Užice Medino, Krnjevo Yugotrejd, Arilje	Frozen fruit and forest products Strawberry and other berries Honey and bee products Raspberry, blackberry, strawberry, plum and cherry
Bulgaria	Adan Village, Damovitsa Mountin Rose, Sofia Amerov Honey, Ignatievo Bilbo, Varna	Seeds and grains (sunflower, flax, spelt) Rose and aromatic plants Honey products Honey products
Croatia	Terra Rossa, Sv. Katarina Zrno Eko Imanje, Dubrava Šolta group of producers	Olive oil 60 vegetable, arable and spicy crops Šoltansko super premium olive oil
Montenegro	Pavličević Zoran, Žabljak Macanović Željko, Pljevlja Mugoša Igor, Podgorica Božović Vučidar, Berane Kolašinac Muhamed, Plav Vučetić Miladin, Pljevlja IN-SPE HM Durmitor	Potatoes, Cabbage, Beetroot, Carrot, Onion, Garlic, Oats, Rye, Barley, Buckwheat Spelled, Barley, Buckwheat, Rye and flour Wild pomegranate, Fig Plum, Apple Honey Aromatic Herbs Lambs, sheeps

Source: Author's research

In 2023, Serbia established a digital register of agricultural holdings through the eAgrar platform. The aim of establishing the Register and digital platform is to improve agricultural production in the Republic of Serbia so that it is productive, rich and respected, and competitive on the EU and social markets (Radičić, 2022). Farmers, entrepreneurs and legal entities – can be registered in the Register. Enrollment is voluntary, free of charge and not bound by a deadline and represents the first step in realizing the right to incentives from the budget of the Republic of Serbia. Within the registry, the E-incentives section functions through which the right

to compensation from state incentives is exercised. In the organic production, incentives are realized in three categories: incentives for plant production, incentives for organic livestock production and incentives for certification. All incentives can be realized by registration and request on the eAgrar software platform.

In accordance with Rule Book on the conditions and method of exercising the right to incentives for organic crops production organic production is the production of agricultural and other products that based on the application of organic production methods in all stages of production, which includes the

use of genetically modified organisms and the products contained therein or are obtained from genetically modified organisms, as well as the use of ionizing radiation. Incentives for organic plant production amount to 63,000 dinars per hectare, and agricultural holdings can apply for a maximum of 20 hectares of arable land. The highest total amount of incentive that the beneficiary of the incentive can achieve in one per calendar year is 1,260,000 dinars. Exceptionally in 2023, incentives for organic plant production are created for areas under organic plant production are determined in the amount that is increased in the corresponding percentage amount in relation to amount for financial contribution for basic incentives in plant production and recourse for fuel prescribed by a special regulation regulating financial giving Agricultural farms for the agricultural production of plant crops in 2023, in accordance with the law regulating incentives in agricultural and rural areas development and a special regulation governing the distribution of incentives in agriculture and rural development (www.minpolj.gov.rs).

Incentives for organic livestock for 2023, according to Rule Book on the conditions and method of exercising the right to incentives for organic livestock production include: premium incentives for milk produced using organic production methods; incentives in organic livestock farming, namely for: quality breeding dairy cows, quality breeding fattening cows and bulls, cows for raising calves for fattening, quality fertile sheep and rams, goats and goats, quality fruits and infertility, fattening kids, fattening pigs, bee hives, heavy-type parental hens, light-type parental hens, parental turkeys, quality breeding queens of carp fish, quality breeding queens of trout fish production. Incentives for organic livestock production are realized per unit, according to Rulebook. The maximum total amount of incentive that the beneficiary of the incentive can achieve for one calendar year in accordance with this Rule Book is 55,000,000 dinars.

Incentives for certification cover certification costs, including laboratory analyses, are reimbursed to organic producers by 50% or 65% for producers who are registered in areas with difficult working conditions in agriculture, in relation to the total costs. The maximum amount per user is 1,000,000 dinars (www.minpolj.gov.rs).

The situation in Bulgaria and Croatia with incentives must be considered within the Eco-schemes are payment schemes in agriculture aiming at the protection of environment and climate. They are a key element of the Common agricultural policy (CAP) (see Article 31 of Regulation (EU) 2021/2115 of the European Parliament and of the Council.

Bulgaria's CAP Strategic Plan has been submitted in 2021, for period 2023-2027. The actual version of the strategic plan includes two eco-schemes for organic maintenance payments in the first pillar: one for organic crops (one rate per ha whatever the type of crop) and one organic grazing animals (payments per animal unit whatever of the type of animal). In the second pillar, one intervention 'organic farming' is planned with two sub-interventions: one for the transition to organic and one for the maintenance of organic. There are payment for crops, grazing animals, pigs (new support) and bee's families. The division of plants into 25 crop groups is new. The payment rate for plants is divided into 3 parts: basic payment, supplement for proven production of at least 70% of the national average, supplement for the use of organic seeds and planting material. Farmers who claim support for maintaining organic production as an eco-scheme under the first pillar cannot claim the first component (basic payment) of the intervention under the second pillar. Another new feature is the introduction of a regressive rate for each of the crop groups, with 100% paid up to 50 ha; 50% from 50 to 65 ha and 10% over 65 ha. The regressive rate will not apply to grassland, pastures, and forage crops. The development of organic farming in Croatia mainly consisted in the increase of organic pastures, grassland, and orchards, and the organic vegetable production has not grown that much in the previous years. This is due to CAP payment model based on hectares. The budget set for organic farming under the first pillar is EUR 1,750,000 million for the whole CAP period (2023-2027). Most of the eco-schemes - representing EUR 93.4 million per year - will be available to conventional farmers only. Payments for maintenance of/conversion to organic farming will not be compatible with eco-schemes because of the double funding issue. Moreover, criteria for eco-schemes are very low and do not incentivize practices with high environmental benefits. Organic farming will lack of comparative advantage given conventional farming will have a higher remuneration given they can accumulate more payments schemes (IFOAM, 2023).

Montenegro grants state incentives (2023) in the field of organic production for the following (<https://www.gov.me/clanak>):

Agricultural producers can receive support per hectare (ha) of production area, conditional head of livestock, poultry and number of bee colonies, which are registered in the Register of entities in organic production within the framework of organic production. Producers who for the first time sign an Agreement on control and certification with an authorized control body for certification (producers

who have been approved to enter the transition period) are obliged to sign the Agreement on the allocation of support funds at the time of submitting the application, by which they undertake to remain in organic production at least three years, otherwise they will be obliged to return the entire amount of support received in previous years. The amount of support per request cannot exceed EUR 20,000.00.

Payment in plant production for: perennial plantings - €450 per ha; field production - €300 per ha, perennial fodder crops – €120 per ha (except in the year of crop establishment – €300 per ha); vegetable production – €380 per ha.

Payment in livestock production by: conditional head of cow and heifer – €120; conditional head of sheep and goats – €120; poultry - €2.5; bee colony - €40.

Payment in organic production for producers who perform the certification process for the first time in the current year is more stimulating in Montenegro: organic plant production for perennial plantings - €500 per ha; field production - €300 per ha; perennial fodder crops 3– 120 € per ha (except in the year of crop establishment – €300 per ha); vegetable production - €400 per ha, apropos in livestock production by: conditional head of cow and heifer – €140; conditional head of sheep and goats – €140; poultry - €3; bee society - €45.

Funds for the purchase of wax for organic production. Beekeepers must have at least 20 bee colonies and a maximum of 100. €20.40/kg is awarded for certified organic wax and the amount of wax is allocated proportionally to the number of bee colonies, with a maximum of 0.5 kg of wax per bee colony.

In addition to state incentives for the development of organic production, there are also international projects such as the Organic Bridge INTERREG - IPA in cooperation with the EU implemented in Serbia and Croatia. The main objective of the Organic Bridge project is to contribute to the improvement of competitiveness of the Osijek-Baranja County and South and North Bačka Districts by developing organic products. The evaluation, according to Evaluation (Impact assessment) of Interreg IPA Cross-border cooperation Programme Croatia-Serbia 2014-2020 findings, these will serve as one of the bases for planning future policies for the development of the Interreg IPA Programme Croatia – Serbia 2021-2027, as well as a tool for improving the quality of future Programme implementation (Interreg – IPA CBC, 2021).

In Serbia, the organic sector has been developing more and more in recent years, with its expansive growth, organic production will have its more intensive application only in the coming period (Tripković et al., 2023). The production of healthy food can be a postulate of satisfying existential needs, but also a factor of revitalization (Bojičić, Tripković, 2023), thus natural assets continue to provide environmental resources and services (Pavićević, 2023). In 2020 the number of producers was 439 and the latest data shows 651 producers in 2022 (MAFWM, 2023). For Bulgaria, this sector is national priority (Shishkov, Kolev, 2014). The number of producers in Bulgaria was 59942 in 2019. Organic production in Croatia is recognized as an important sector and the number of organic producers is growing. Montenegro shows no progress. (Table 6).

Table 6 - Number of producers and other operator types by country (2021)

Country	Producers	Processors	Importers	Exporters	Producers 2019-2020	Trend
Serbia	458	152	74	82	439	+19
Bulgaria	5942	249	22	2	5942	0
Croatia	6024	378	12	No data	5153	+871
Montenegro	422	25	No data	0	423	-1

Source: Author's systematization based on FiBL&IFOAM survey, 2023

When we compare areas of organic agricultural land in three top European countries: France (2548677 ha), Spain (2437891 ha) and Italy (2095380 ha) with the situation in observed Balkan countries, we can conclude that Bulgaria (116253 ha) and Croatia (108610 ha) are among the countries with medium values, while Serbia (19317 ha) and Montenegro (4404 ha) are still at the bottom of the scale (Table 7).

Organic share in total agricultural land data shows big efforts of Croatia (7.2%) as 27th world

country, Bulgaria (2.3%) takes 52nd place, and Serbia with less than 1% (0.6%) takes 92nd place in the world scale. Ten-year development data are encouraging in all three countries: in Bulgaria the increase in organic agricultural land is 346.4%, in Croatia 239%, and in Serbia 209.7%. Serbia's noticeably weaker results may be a consequence of the fact that it is not a member of the EU, like Bulgaria (member since 2007) and Croatia (member since 2011). Otherwise, organic share in total agricultural land in Montenegro is 1.9%, while its ten-years growth is 57,2%..

Table 7 - Organic farming indicators data in Serbia, Bulgaria, Croatia, Montenegro (2020)

Indicator Country	Organic agricultural land (including in-conversion areas) in ha	Organic shares of total agricultural land, in %	Organic Agricultural land development – 10-years growth in %
Serbia	19317	0,6	209,7
Bulgaria	116253	2,3	364,6
Croatia	108610	7,2	239,0
Montenegro	4823	1,9	57,2

Source: Author's systematization based on FiBL & IFOAM – Organics International (2023)

After investigation of organic production indicators in selected countries, it is necessary to consider the characteristics of the soil.

Based on reasearches of Bašić (2013), Pavlović et al. (2017), Shishkov&Kolev (2014) and Protić et al. (2005) Serbia has diverse resources and soil of different taxonomies, which is why Serbia is close to Bulgaria in terms of the amount of chernozem and fluvisol, unlike Croatia, which has less soil of that quality. Montenegro has areas of Cambisol, such as Serbia. Lower areas of Fluvisol are shown in Croatia and Montenegro. Croatia and Serbia have the numerous deposits of lignite. Significant amounts of land in Croatia and Serbia are not suitable for organic production because of lignite, burnt down in coal fired plants surface soils and polluted environment (air, water, soil) by ash with heavy metals and other phytotoxic elements. Disturbance and damage of land in Bulgaria is the result of coal and ore mining, and the extraction or quarrying of non-metal mineral resources, like raw materials for the cement industry, facing stone materials and building materials. Mining industry provides more than 50% of used energy in the country (Kirilov, Banov, 2016). A total of 422 contaminated and potentially contaminated localities have been identified in the Republic of Serbia. The largest share in the total number is that of public utility landfills with 43.13%, followed by industrial and commercial sites with 36.30% and industrial waste landfills with 10.43%. The largest share within the industry is that of the oil industry with 41.89%, followed by the chemical industry with 14.41%, the metal industry with 11.71% of localities, a slightly smaller percentage are energy plants with 8.57% and mines with 4.50% of localities. In Montenegro, we found certain types of soil near polymetallic mines and lignite fields, smelters, fire pit-heating plants, factories and other industrial facilities can become phytotoxic and unsuitable for organic production. Most of the soils in Montenegro have a shallow soil profile and low contents of nutrients (Vidojević et al., 2022).

Each country has its own specifics in terms of the use of its resources and the quality of land resources.

Organic production in Serbia is rapidly growing area of agriculture, by the collected data of relevant institutions in Serbia, we can notice necessity of three important steps in organic agriculture improvement: investment to knowledge, education and digitalization, modern legislative and conversion of lands from conventional to organic production capable lands. The application uses sensors to collect precise data on weather conditions and forecasts, provides information on soil quality and plant growth density based on vegetation and soil maps, offers suggestions for agrotechnical measures, monitors diseases, insect infestations, etc. (Petrović et al., 2022).

In 2019 Ministry of Agriculture of Bulgaria (MinAg) published its National Action Plan for Development of Organic Production for 2020-2027. MinAg emphasizes that the organics industry is a national priority (USDA, 2023). When considering the growth of the organic sector in the previous ten-year period of 364.6%, the number of 5942 organic producers and the significant number of organic beehives (274000), it is clear that Bulgaria is making efforts. Bulgaria has a rich production of organic honey, but coal fired heating by lignite, especially, devastates the soil. Croatia applies all the regulations regarding organic food production and labelling, including the national label for organic food (Labelling of Food and Animal Feed in Organic Production Regulation, No 25/11).

Certified organic food production in Croatia is considerably lower than in other EU member countries (Gajdić et al., 2018), thus this research confirms the differences between Croatia and Bulgaria. However, it must be taken into account organic share in total agricultural land with 7.2% in Croatia (Bašić, 2013) and 2.3% in Bulgaria. Montenegro has negative trend in number of producers (-1) compared to the previous period, total 422, but the data show that share of 1.9% of total agricultural land is higher than in Serbia (0.6%). Serbia has sufficient natural resources for the development of organic agriculture, but has not finance support for acceptable technologies and means of production (Jovanović, Stojkov Pavlović, 2023). In general, when it

comes to the number of producers, the trend is positive in Serbia (+19) and Croatia (+871), there are no changes in Bulgaria, while the trend is negative in Montenegro.

CONCLUSION

The development of organic agriculture in the Western Balkans is connected with the processes in the European Union, given that the countries of the Western Balkans are also members of the European Union. This study presents results for two member states and two candidate countries. Organic agriculture makes its contribution to the development of the green economy in the following areas: economic, ecological and social, which at the same time represent the three most important pillars of sustainable development. Economic contributions to the development of the green economy are reflected in the further stimulation of the growth of organic production, the increase of productivity and efficiency and the provision of sufficient food to fulfill the demand of the growing world population. Increased demand for organic products leads to increased income and employment, thus organic agriculture perhaps we can place it even more closely as a bio-economic activity, given that it fully corresponds to its goals. Industrial processes that affect the soil also affect organic production. However without investments coming from the private and public sector and the support of the government, it is not possible to achieve the development of organic agriculture, and therefore, to achieve the basic goals of the green economy concept. The increase in the area of arable land under organic production, as well as the increase in number of organic producers testify in favor of the fact that the concept of organic production is outlook and long-term profitable activity, with multi-functional advantages. Success of organic farming depends on soil quality and permanent improvement of the soil. Improvement of the soil for organic production realize by composting and use of residual organic substances after recycling. Financial support for the development of organic production sector in Serbia is provided for organic producers to do their administrative and technical activities through the eAgrar platform. Platform is the first interactive database on organic agriculture managed by the authority from the Ministry of Agriculture. The transition from fossil sources to renewable energetic sources is obligatory for organic agriculture development. Montenegro, considering the size of the country and its development, is not far behind, the advantage is almost 30,000 ha of Terra Rossa land of typical quality, but it is necessary to invest

additional efforts in the regulatory mechanism of organic production.

Bulgaria and Croatia are committed to the Action plan for organic production in the European Union 2021-2027 and CAP policy through their Eco-Schemes. Serbia and Montenegro to harmonize future the regulations with the Action plan for organic production in the European Union 2021-2027 and they manage this sector based on practices of more developed countries in this sector, such as Italy, while in such practice, despite the adopted EU regulation, it is necessary for the members of Bulgaria and Croatia to make further efforts.

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