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Current situation, potentials and prospects for the development of organic farming in Šumadija

**Duško Brković¹, Milena Đurić¹, Milorad Krsmanović¹,
Brankica Luković², Milena Mijajlović², Fejzo Begović³**

¹*University of Kragujevac, Faculty of Agronomy, Čačak*

²*College of Applied Technology Studies, Aranđelovac, Serbia*

³*The agricultural school, Gradačac, Bosnia and Herzegovina*

Abstract: Šumadija is rich in natural potentials which provide a good basis for the future development of organic farming, given the fact that natural resources are limited. The composition and structure of natural resources are highly suitable for organic production. The region's relatively unpolluted land, favourable climate, abundant water resources and preserved biodiversity are some of the main organic farming requirements satisfied. Organic production is not possible without ensuring at least a minimum level of preservation of natural resources in areas where organic farming is practised; on the other hand, organic production itself has a positive effect on the preservation and improvement of environmental quality in these areas. Small plots of land can be advantageous for this production, particularly in upland areas, and used specifically for organic production as the conversion period is short. They can be used for vegetable farming because the soil is uncontaminated owing to distance from roads. Positive experience indicates that potatoes, rye, oats and root vegetables can be successfully grown in these areas. Another advantage is the wealth of indigenous cultivars of apples, pears and plums which are highly resistant to pathogenic pests and environmental conditions, and hence suitable for cultivation without the use of mineral fertilisers and chemical agents.

Major issues currently facing organic farming are a small-scale organic market and low prices of organic products, a low level of consumer awareness of the advantages of organic farming, suspicion and ignorance, low purchasing power, low availability of organic products through sales channels, etc.

Key words: Šumadija, organic farming, sustainable development, agricultural production

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Introduction

Organic farming is a new concept of food production which originated in the 1980s in developed countries in response to increasing environmental pollution problems. This new concept of production is a chance for Šumadija to use its potentials and resources to develop a competitive organic production sector. Over the years, there has been a steady increase in this sector in the number of consumers, consumption and land area under organic production, which indicates great potential for further growth.

Organic agriculture is a type of farming which relies on the use of crop rotation, manure, compost and biological control of harmful organisms to maintain soil productivity and control pests on farms. Organic farming avoids the use of synthetic fertilisers, pesticides, plant growth regulators, animal drugs, food additives and genetically modified organisms. There has been a rising demand for organic products on a global scale. The domestic organic market is small and underdeveloped. All parts of the organic production chain are included, but they lack interconnection, and the sector is disorganised, resulting in lack of coordination and collaboration among projects, activities and stakeholders.

The development of the domestic market is retarded due to poorly organised production, distribution deficiencies and poor promotion through media channels. Farmers' associations are focused on production and are not strong enough to organise or promote the organic sector. Government is the main impetus in the development of organic farming.

Elaboration and discussion

The concept of sustainable development was first mentioned in 1982 at the Nairobi Conference. In 1983, the UN General Assembly passed a resolution on taking the initiative to establish the World Commission on Environment and Development. In 1987, the Commission published a report titled "Our Common Future" addressing issues concerning the negative impacts of uncontrolled demographic and economic growth, and stressing the need to define the concept of sustainable development. The term "sustainable development" was established in 1989 and officially proclaimed in the so-called Bergen Declaration (1990) at the Ministerial Conference in Bergen, Norway, organised by the Norwegian Government in collaboration with the UN Economic Commission for Europe. The concept of sustainable development was adopted by the European Union and United Nations in 1990 and 1992, respectively. The worldwide adoption of this concept was furthered by knowledge of severe global changes and environmental pollution. The most powerful definition of sustainable development is the one proposed by the Brundtland Commission: (Brundtland Commission, 1987)

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

The definition of sustainable development formulated by the Brundtland Commission includes two key concepts: (1) the concept of needs, which comprises the conditions for reaching or maintaining an acceptable life standard for all people, and (2) the concept of limitations imposed by the level of technology and social organisation on the environment's capacity to meet present and future needs. The concept of needs is the basis for intragenerational equity, whereas the concept of limitations underlies intergenerational equity. In terms of environmental management and environmental economics, sustainable development is defined as “the management of Earth's resources in the way to ensure their long-term quality and sufficiency” (Milutinović, S, 2012).

The concept of sustainable development includes a number of components which depict its link and harmonisation with the needs and limitations of the environment. These are: balanced economic growth, social justice and a sound environment. Balanced economic growth (production and consumption) implies a judicious use of natural resources for the production of multi-purpose and multiple-use products with the smallest possible amounts of waste material and harmful emissions generated. Social justice requires an appropriate global policy and adoption (and observance) of a number of legal and other instruments specifically focusing on health, education and population policy. Also, social justice should be established at the national level as well, through civil and other rights, paying due attention to the status of women who are unfortunately still considered second-class citizens in many countries.

A sound environment is secured through sustainable development. As the environment is polluted and degraded, the following gradual steps should be taken towards its restoration: prevent further degradation, improve existing factors, reconstruction, revitalisation, recultivation, renaturalisation or other types of renewal, new development plants should include all guidelines i.e. principles regarding sustainable development, particularly the ones related to the prevention of causative agents of potential risks (Baker S., Kousis M., Richardson and Young S., 2007).

The importance of the sustainable development concept primarily lies in establishing a balance among its components, thereby counterbalancing the harmful effects of human activities on the environment and, hence, ensuring the survival of the industrial civilisation (the economic approach is implied).

The idea and conception of sustainable development rely on the following principles:

- precaution, risk prediction, cause prevention, new environmental evaluation, changing behavioural patterns, changing consumption patterns and establishing necessary demographic institutions and processes.

The precautionary principle involves preliminary analysis and assessment of potential harmful effects during planning and implementation of all

development-related actions such as the use of resources and space, effect on biodiversity, pollution etc. The risk prediction principle is based on the preliminary assessment of the effect of planned actions, especially if they are concerned with dangerous, poisonous and other processes, substances or actions which may lead to pollution or risk, based on similar experiences and situations. The cause prevention principle is the most important step in environmental protection, as it ensures long-term development of the environment. Moreover, it prevents future treatment of the consequences of side effects.

The principle advocating new environmental evaluation comprises completely new approaches: the ecosystemic or multidisciplinary approach; the ethical approach, towards the environment and its factors, towards the preservation of resources, plants and animals, in one's immediate and distant environments, towards other people, nations, generations; the future-oriented approach, involving continuous planning and leaving options for others to create their own development, rather than being controlled by previous generations; advocating a moderate state of development entailing a new paradigm of "survival" and a modest standard of living instead of material growth and luxury; moderate and frugal use of the environment and its richness, especially non-renewable energy and biodiversity.

The principle of changing behavioural patterns is an important requirement for sustainable development, focusing on a new philosophy of live – survival. Through behavioural change, human conduct towards the environment changes from destruction to protection. It implies a change from a consumer mentality to a mentality characterised by a reasonable and modest use of resources, in both production and consumption, which is designed to meet only human essentials without any wish for luxury and splendour. Consumption should be free of remains (any type of waste; in other words, complete recycling). The principle of establishing new demographic institutions and processes refers to the need to include demographic dynamics and its trends in environmental and sustainable development programmes, given the fact that demographic growth is the main factor in threatening the biosphere and its ecosystems (Barbier, E. B., 2001).

Organic production is a system involving the ecological management of production, processing, packaging, storage, transport, labelling, marketing and control of organically produced food in accordance with the standards of the International Federation of Organic Agriculture Movements (IFOAM), EU regulations adopted in 2007 and Codex Alimentarius – a joint FAO / WHO programme (Food and Agriculture Organisation/World Health Organisation).

Organic agriculture is defined by the IFOAM as follows: "Organic agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and

promote fair relationships and a good quality of life for all involved.” (Tomić, G., Đurica, M., Bugar, D., 2010).

“Organic production is an overall system of farm management and food production that combines best environmental practices, a high level of biodiversity, the preservation of natural resources, the application of high animal welfare standards and a production method in line with the consumers’ preference for products created using natural substances and processes.” (Tomaš, M., 2013). The principle aims of organic agriculture are: to produce high quality nutritious food; to preserve ecosystems; to maintain and increase long-term fertility of soils; to use, as far as possible, renewable resources of energy; to maintain the genetic diversity of agro- and ecosystems; to protect the environment i.e. reduce all types of pollution coming from agriculture to ensure that farmers’ basic needs are satisfied and adequate gain attained. This production system first emerged as a movement in economically developed countries. It is estimated that the percent contribution of these products to the world food market will continue to increase in the coming years (Zubović, J., Domazet, I, 2007).

Organic production is more different from conventional production than from other types of alternative agriculture. Organic farming is a fully controlled system. Production conditions must be adapted to country-specific conditions and legally regulated. These primarily include the isolation of plots, livestock farms and processing facilities from potential sources of pollution, a low level of harmful substances in soils, suitable quality of irrigation water, harmonised development of plant and animal production, trained experts and producers, and the need for continuous innovation and advancement of knowledge.

Organic production is based on four coordinated ecological principles:

- principle of health, principle of ecology, principle of fairness towards nature and life, principle of production sustainability to preserve the well-being of current and future generations of people and ecosystems.

Principle of health – Organic agriculture should maintain and enhance the health of soils, plants, animals, humans and the planet as one and indivisible. The role of organic agriculture, in either farming, food processing, distribution or consumption, is to support and foster the health of ecosystems and organisms from the smallest ones existing in the soil to people. Specifically, organic farming is intended to produce high quality, nutritious food that contributes to preventive health care.

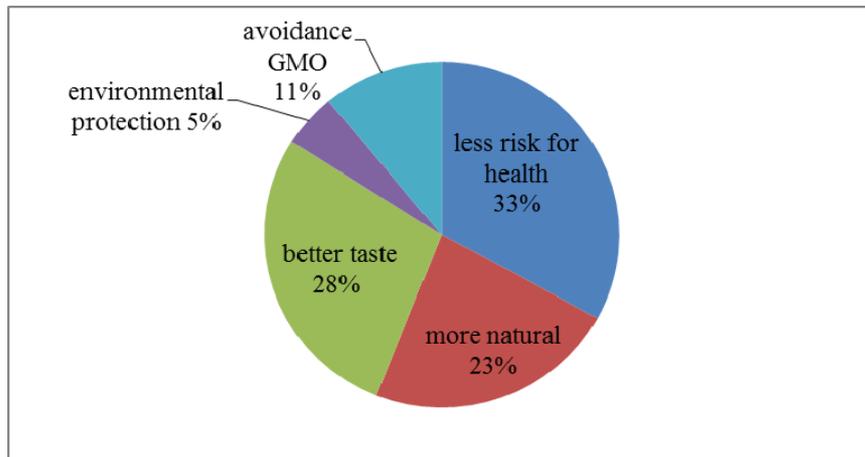
Principle of ecology – Organic production should be based on natural inputs and processes rather than on synthetic ones. Organic farming should attain ecological balance through careful design of farming systems, establishment of habitats and maintenance of genetic and agricultural diversity.

Principle of fairness – Organic farming should build relationships that ensure fairness in view of the common environment and life chances. Fairness is

characterised by respect, justice and care of the shared world, both among people and in their relations to other living beings.

Principle of care and protection – Organic agriculture should be managed in a precautionary and responsible manner to protect the health and well-being of current and future generations of people and the environment. Organic farmers should promote efficiency and increase productivity, while preventing risks related to health and well-being (Lazić, B., Vujošević, A., 2006).

As estimated by OECD, people purchase organic products for several reasons: fewer health risks (33%), better taste (28%), organic food is more “natural” (23%), avoidance of genetically modified products at any cost (11%), contribution to environmental protection (5%) (Graph 1) (www.oecd.org, 2015)



Graph 1. Reasons to consume organic products avoidance of GMOs, environmental protection, better taste, more natural, fewer health risks

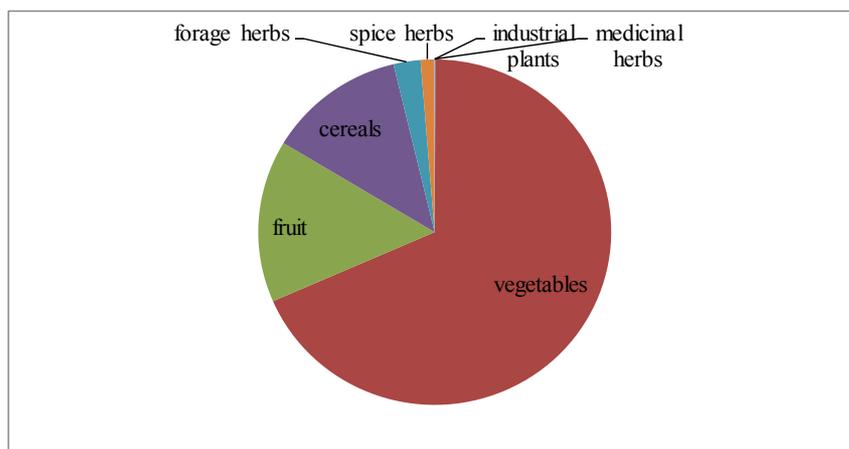
In developed industrial societies, the middle class is well educated and has good purchasing power, which is the main reason for the fact that the sale of organic products is highest in developed countries, in this social stratum. As a relatively low percentage of income is spent on food, price is not an issue for these consumers to opt for organic products.

A typical buyer of organic products lives in an urban area, mostly in a city; pays great attention to product characteristics, such as quality, production method and origin; typically holds a university degree and is a member of the middle class, an intellectual, a newspaper reader and an internet user, having medium to high purchasing power (Čikić, J., Petrović, Ž. 2010).

As regards the average age of a typical buyer of organic products, variations are observed across countries. A typical European consumer of organic food is a representative of a younger generation of consumers, between 25 and 35 years of

age. In Great Britain and Italy, average buyers are generally people under 30 and those between 50 and 70 years of age. In Ireland, their age ranges from 35 to 55. The conclusion is that the consumer profile is also dependent on the age of the organic market concerned. In mature organic markets (the ones which developed the earliest), such as Great Britain and Denmark, older consumers are more numerous (Babović, J., Lazić, B., Malešević, M., Gajić, Ž. 2005).

According to data released by the Ministry of Agriculture, the total land area under organic farming in Serbia in 2013 was 3,865 ha, and about 30 ha were subjected to conversion. Although arable land area under organic farming in the last several years has increased at an annual rate of 20%, its percentage in the total agricultural acreage is still low, considering the abundance of natural resources in Serbia (www.minpolj.gov.rs). In Serbia, the organic production method is used to grow fruit, vegetable and field crops. Regions suitable for organic fruit production are western and southern parts of Serbia, whereas Vojvodina is suitable for vegetable production. The organic farming method is less commonly used for livestock production as the cost of the process is higher than for fruit and field crops. Nevertheless, some progress has been made as some producers have already started to grow indigenous breeds using this method. In 2012, the organic method gave yields of 430,500 kg vegetables; 95,500 kg fruit; and 79,500 kg cereals, whereas the amount of medicinal herbs produced was the lowest, about 425 kg (Graph 2) (Tomaš, M. 2013).



Graph 2. Yields of organic products in Serbia, 2012 (in kilograms) Medicinal plants, Industrial crops, Forage crops, Culinary herbs, Field crops, Fruit crops, Vegetable crops

Šumadija is located in central Serbia which abounds in watercourses. Natural conditions in this region favour the development of diverse agricultural systems.

Alluvial plains in river valleys are favourable for the development of field and vegetable crop production, whereas uplands are suitable for grapevine and fruit growing. Soils are mostly used for arable farming, orchards and vineyards, but there are also grasslands and forest land. Agricultural production is a major economic activity in Šumadija. The income achieved from farming in 2013 accounts for 24.3% of the region's net domestic product. Until the last decade of the 20th century, "socially-owned" farms and processing facilities affected farmers' production orientation in this region (Regional Agency for the Economic Development of Šumadija, 2014).

The development of farming can be substantially enhanced by diversification – through the introduction of "more intensive and accumulating" fruit and vegetable crops, use of new good-quality high-yielding cultivars and hybrids adapted to environmental conditions, intensive continuous production of green fodder throughout the grazing season and improvement of the livestock breed structure. To be successful and to yield positive results, the diversification process should be adapted to the specific characteristics of local agricultural systems. The agricultural land owned by private farmers in the Šumadija region is structured as follows: arable land and vegetable gardens as the most dominant type of land use (70.5%), orchards (9.5%), grasslands i.e. pastures and meadows (18.1%), and vineyards (2%).

According to the latest official census conducted in 2012, the municipalities in Šumadija have 64,062 residents involved in agriculture, accounting for 12.2% of the total population in the region. Two thirds of this number are actively engaged in farming. The comparison of these data with the state-level data indicates that the percentage of agricultural farmers in the region is somewhat higher than that at the national level. Namely, residents involved in agriculture make up 10.9% of the total population in the Republic of Serbia, with 64.8% actively engaged in farming.

The domestic organic market is small-scale and underdeveloped. As estimated, only 5% of organic products end up in the domestic market. According to data provided by Terras website (www.terras.org.rs, 2015), organic products are available in few specialised retail and wholesale stores and on few specialised farms. The organic market in Šumadija is characterised by the following: most products come from export, food products are of domestic origin, the retail sector is undeveloped, consumers are unfamiliar with the main issues of organic farming, organic product labels are unrecognisable, fake organic products. Due to the sale of fake products promoted as ecological and organic, consumers in this region have become sceptical about purchasing organic products. This problem should be solved by ensuring more frequent inspection and high penalty rates for violators to protect both consumers and producers of organic food. It will be long before organic products in Serbia become popular because of factors such as (Radivojčević, 2012): consumer unfamiliarity, low purchasing power, low availability of organic products

through sales channels in the domestic market, prices up to 3-4 times i.e. on average 40-50 % higher than conventional products, relative safety of conventional foods.

Given the underdevelopment of the organic market in Šumadija, the role of marketing is essential. Strengthening consumer demand for organic products is directly affected by consumer dietary and purchasing habits. Making changes to habits is directly dependent on the level of consciousness. In association with government bodies, higher education institutions, organic food associations and the mass media, food producers and distributors can have a positive effect on consumer attitudes and behaviour towards the organic food culture. An important element in the development of consumer consciousness about organic farming and organic products is recognisability with respect to labelling and sales points. Another factor in increasing the consumption of organic products in the country is quality assurance i.e. consumer trust in organic producers and control systems. Moreover, market supply is an important factor in increasing the demand for organic products. More precisely, a wider distribution network and greater diversity of product choices, along with clearly visible labelling recognisable to consumers, make organic products increasingly available to consumers and, hence, potentially increase the demand for organic food (Radivojčević, 2012). Šumadija is rich in natural potential as a good basis for the future development of organic farming, given that natural resources are limited. The composition and structure of natural resources are highly favourable.

The region has relatively unpolluted soils, a favourable climate, abundant water resources and preserved biodiversity, which are some of the main organic farming requirements satisfied. In other words, organic production is not possible without ensuring at least a minimum level of preservation of natural resources in areas where organic farming is practised; on the other hand, organic production itself has a positive effect on the preservation and improvement of environmental quality in these areas. Most agricultural land is owned by natural persons i.e. family farms. Small-sized family farms dominate, with an average farm size of 2.49 ha.

Small plots of land can be advantageous for this production, particularly in upland areas, and used specifically for organic production as the conversion period is short. They can be used for the production of small fruits (raspberries, blackberries, blueberries, strawberries, currants) because the soil is uncontaminated owing to distance from roads. Positive experience indicates that potatoes, rye, oats and root vegetables can be successfully grown in these areas. Another advantage is the wealth of indigenous cultivars of apples, pears and plums which are highly resistant to pathogenic pests and environmental conditions, and hence suitable for cultivation without the use of mineral fertilisers and chemical agents.

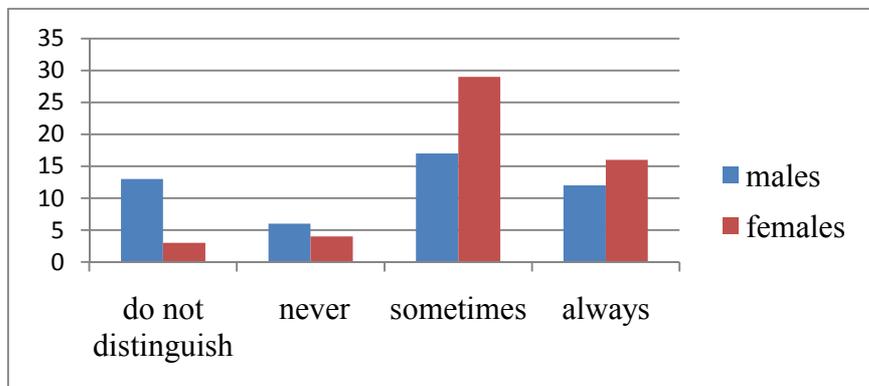
The development of organic fruit growing provides the basis for the development of organic beekeeping. In this region, there are natural grasslands suitable for the production of small livestock.

In the postwar period, the prioritisation of industry and other non-agricultural activities has resulted in reduced numbers of residents involved in agriculture, accompanied by the migration of rural population to urban areas. Today, about 40% of the total population is rural, and 60% is urban. There has been a continuous tendency for the urban population to increase. The long-standing migration of the rural population, notably its most productive residents, to urban areas has led to a decline in working-age population in villages.

Most villages, particularly those in the uplands, have become extinct; therefore, the introduction and promotion of organic farming in these areas are the main instruments of sustainable development, eventually leading to the revival of rural areas. As observed, farm households which have a considerable number of working-age members involved in agriculture - as potential active participants in organic farming - account for only 5.3% of the total number of farm households in this group, indicating that the potentials of active labour are unfavourable, given the number and age of residents actively engaged in agriculture.

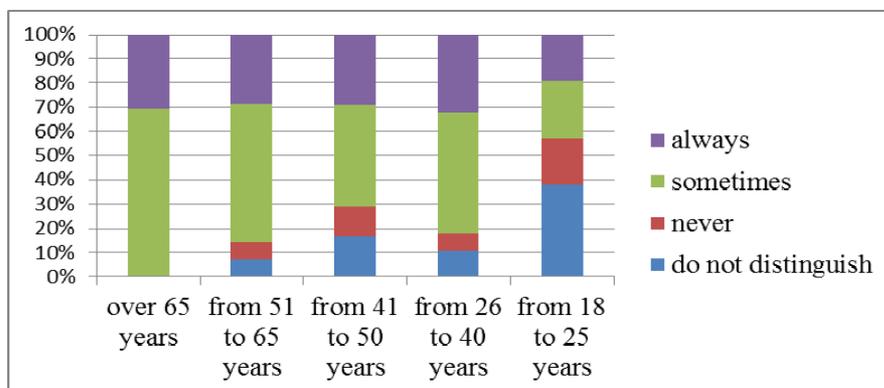
Accordingly, a potential barrier to the involvement of more farm households in the organic farming system in Šumadija, in economic terms, is expected to be associated with the costs of additional labour in agriculture. This problem is further complicated by the fact that workers in organic farming require specific training, which results in increased costs. Serbia has favourable conditions for the development of organic farming (Pejanović et al., 2011). Residents in Šumadija (Kragujevac) were surveyed about major issues regarding the use and consumption of organic products, the differences between conventional and organic foods and the ways respondents become informed about the notion of organic food and its consumption (Mijajlović, 2015).

The first question in the survey was about whether they pay attention to the organic origin of the food they buy. The survey responses were filtered by respondents' gender and age (Graph 3).



Graph 3. Respondents' attitudes towards the use/consumption of organic food by gender

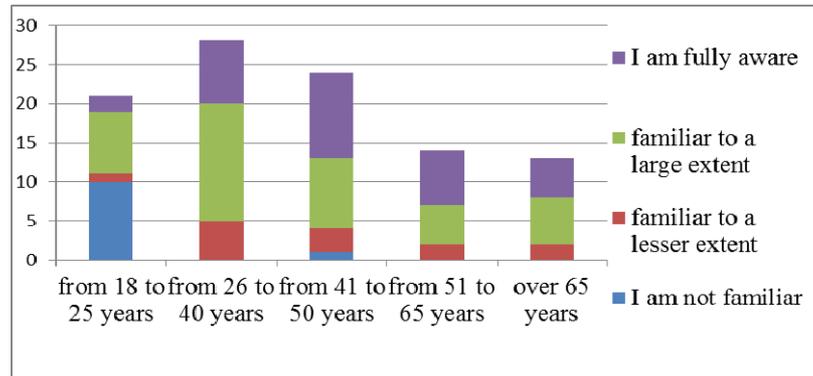
The data obtained show that female residents pay more attention to the organic origin of food than male residents, with only 12 males responding positively (Graph 4).



Graph 4. Respondents' attitudes towards the use/consumption of organic food by age

The survey results show that consumers aged 26-40 years pay the greatest attention to the organic origin of the food they buy, whereas the least attention is given by the youngest residents i.e. the youngest respondents because more than 60% of them make no difference and never pay attention to the organic origin of the food consumed. On the other hand, the organic origin of the food consumed is almost always important for the oldest residents surveyed.

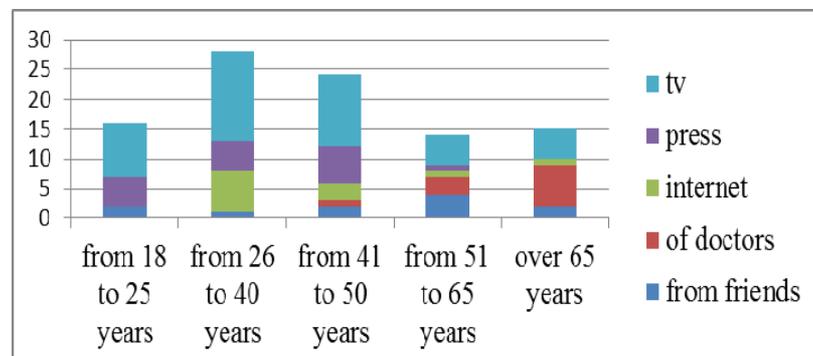
The next research topic was the level of respondents' familiarity with the difference between organic and conventional foods (Graph 5).



Graph 5. Respondents' familiarity with the difference between organic and conventional foods by age

Respondents above from 26 to 40 years of age are almost completely familiar with the differences, those in the 41-50 age group are mostly familiar, whereas most of the respondents unfamiliar with the differences between organic and conventional foods are aged between 18 and 25 years.

The data on the ways respondents become informed about the benefits of healthy diet across different age groups show that the youngest respondents/residents and those in the 26-40 age group obtain information generally through TV and the internet. The older respondents mostly use the print media or friendly advice in addition to TV, whereas the oldest respondents i.e. residents over 65 become informed in healthcare facilities i.e. through their healthcare practitioners (Graph 6).



Graph 6. How respondents become informed of the benefits of organic food across different age groups

Overall, TV is the most popular media through which the Šumadija residents surveyed obtain information on the benefits of organic food i.e. healthy diet.

Conclusion

About 0.3% of the total arable land in Serbia is under organic farming, as opposed to 24% in Europe, mostly in Spain and Italy (more than a million hectares). Vojvodina and Šumadija regions have the largest percentage of land under organic production, but this type of farming is becoming increasingly common in western and southern parts of Serbia. As projected by the Serbian Ministry of Agriculture, Forestry and Water Management, the total land area under organic farming should be more than 50,000 ha by 2016, with as many as 600,000 ha set as a long-run target.

Organic production is associated with the multifunctional nature of agriculture and ensures the preservation of village life, tradition, authentic culture and traditional craftsmanship, and the development of a specific type of rural tourism i.e. ecotourism. Lack of consumer awareness, an underdeveloped market, low demand, a low standard of living, high costs of control and certification, and lack of plant protection products are just some of the many problems facing organic producers.

According to research data for the Šumadija region, people buy organic food mostly because they understand its role in reducing health risks (33%), followed by reasons such as better taste of organic products, organic food is more natural, avoidance of genetically modified products in their diet, and consumption of organic products to control illness.

The organic sector has been largely promoted by supermarkets through the inclusion of organic products in their product portfolio, thus leading to the popularisation and increased sale of these products. Šumadija is rich in natural potentials which provide a good basis for the future development of organic farming, given the fact that natural resources are limited. In addition, Šumadija has relatively unpolluted soils, a favourable climate, abundant water resources and preserved biodiversity.

Most agricultural land is owned by natural persons i.e. family farms. Small plots of land can be advantageous for organic production, particularly in hilly and upland areas, for the cultivation of berries and indigenous apple, pear and plum cultivars highly resistant to pathogenic pests and environmental conditions.

The main advantages of organic farming in Šumadija are the suitability of natural resources in terms of composition and structure, proximity to the European market, and harmonisation of related laws and regulations with EU standards.

The primary reason behind the low percentage of organic farms in Šumadija is that producers and extension service providers lack knowledge of organic production, its importance and the technology used. Moreover, further constraints include low financial ability of producers; an insufficient market supply of plant nutrition and protection products, seeds and planting material; underdevelopment of both the market structure and the domestic market for organic products; and an insufficient number of producers' associations and their poor organisation.

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TREKUTNO STANJE, POTENCIJALI I PERSPEKTIVE ZA RAZVOJ ORGANSKE PROIZVODNJE U ŠUMADIJI

**Duško Brković¹, Milena Đurić¹, Milorad Krsmanović¹
Brankica Luković², Milena Mijajlović², Fejzo Begović³**

¹*Agronomski fakultet, Univerzitet u Kragujevcu, Srbija*

²*Visoka tehnološka škola strukovnih studija, Aranđelovac, Srbija*

³*Poljoprivredna škola, Gradačac, Bosna I Hercegovina*

Rezime

Šumadija raspolaže bogatim prirodnim kapacitetima koji predstavljaju dobru osnovu za budući razvoj organske poljoprivrede, s obzirom na to da su prirodni resursi ograničeni. Sastav i struktura prirodnih resursa je veoma povoljna. Šumadija raspolaže relativno nezagađenim zemljištem, ima povoljnu klimu i bogat vodni potencijal i očuvan biodiverzitet, što je sve zajedno jedna od osnovnih pretpostavki za bavljenje organskom poljoprivredom. Organska proizvodnja nije moguća ako ne postoji minimalno potrebna očuvanost prirodnih resursa u područjima u kojima se organizuje proizvodnja, dok s druge strane sam proces organske proizvodnje pozitivno utiče na očuvanje i unapređenje kvaliteta životne sredine ovih područja. Usitnjenost poseda može da bude prednost za ovu proizvodnju, posebno u brdsko planinskim područjima. Ove površine bi mogle da se koriste upravo za organsku proizvodnju, jer bi period konverzije bio kratak. Mogu se koristiti za gajenje sitnog povrća jer nisu zagađene, zahvaljujući prostornoj izolovanosti od saobraćajnica. Pozitivna iskustva ukazuju da se na ovim područjima mogu uspešno gajiti krompir, raž, ovas, korenasto povrće. Veliko bogatstvo predstavljaju autohtone sorte jabuka, krušaka, šljiva, koje se odlikuju visokim stepenom otpornosti na patogene štetočine i uslove spoljašnje sredine, pa se mogu gajiti bez upotrebe mineralnih đubriva i hemijskih sredstava.

Trenutno veliki problem predstavlja plasman proizvoda organske proizvodnje, prvenstveno malo tržište i niske cene organski proizvedene hrane. Takođe problem predstavlja i nedovoljan nivo edukovanosti stanovništva u pogledu prednosti organske proizvodnje, kao i određen nivo skepse prema istoj, kao i neupućenost potrošača, niska kupovna moć, mala dostupnost organskih proizvoda na domaćem tržištu koji nisu dovoljno zastupljeni kroz kanale prodaje itd.

Ključne reči: Šumadijski okrug, organska proizvodnja, održivi razvoj, poljoprivredna proizvodnja.