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ORGANIC PRODUCTION IN PROTECTED AREAS OF THE UPPER DANUBEREGION¹

JOVANOVIĆ MARIJANA², BEKIĆ BOJANA³, NASTIĆ LANA⁴

Summary

Organic production requires strictly controlled conditions for the implementation on specific locality. Fulfillment of conditions of reduced use of chemicals, the use of unpolluted water, creating a protective belt around the farms and fields, preventing pollution, we get the basis for the development of this method of production with environmental protection and good quality of final products. Organic products have a major role in the strengthening of the local environment; it provides certified production provides a stable economic niche to sell in the domestic and foreign markets. The advantages of the area of the Upper Danube region lies in the fact that the spreads in the part of Serbia known for intensive organic agriculture in the AP Vojvodina. This paper will present recent results in organic production in the Republic of Serbia, with emphasis on the territory of the Upper Danube, as well as opportunities for future development of organic farming in the territory of the protected area of the Upper Danube municipal administration. Closeness of the Danube River opens new possibilities for connecting local markets.

Key words: *organic production, local environment, Upper Danube region*

INTRODUCTION

Organic production represents complete production process of agricultural products of plants or animal origin, which are sustainably exploit natural resources, with particular emphasis on preservation of the environment from pollution from agriculture. In AP Vojvodina, agricultural activity has a long history and in the last three decades, the area under organic farming is increasing. Features that make this method of agriculture could be used to revitalize municipalities located along the Danube and the whole region of the Upper Danube. Region encompasses the municipalities of Sombor, Apatin, Bač and Bačka Palanka municipality and they all gravitate towards the river Danube and are characterized by specific endemic and species of animals and plants, and many protected areas.

Applying the methods of organic agriculture is possible in the territory of protected areas, given the current economic potentials and orientation municipalities to crop production. In this way, biodiversity will be preserved, reduce the pollution of natural resources, primarily agricultural land. The region Upper Danube is suitable for this type of production, and because of the proximity of the Danube River, which opens the door to easier connecting farmers, both locally and from producers in neighboring countries, to the formation of the optimal product prices and transport costs are less. This is significant because in the European Union consumption of organic produce is more intense than what can be produced. This would mean that for the Upper Danube region a production opportunity, which could animate a considerable number of human strength and attraction of foreign investments in this segment of agricultural production.

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MATERIAL AND METHODS

Knowledge in the characteristics of the Upper Danube and the traditional orientation towards agriculture and food production, a precondition for the improvement and innovation of the manufacturing process, thus the final products can later find an adequate market. According to statistical data, public institutions, forecast of the Ministry of Agriculture, Trade, Forestry and Water Management of the Republic of Serbia, as well as a number of strategies that have been conducted by eminent institutions will conduct research on the possibilities of applying the methods of organic agriculture in the territory of the Upper Danube. The collected data will be analyzed using the analytical methods.

RESULTS AND DISCUSSION

Upper Danube region, known as a special nature reserve stretches on the left bank of the Danube River, and the flow of 1367 km to 1433 km overall flow. Represents a large part of the complex that spans two countries (Hungary and Croatia). Its natural features have represents an area of great importance for the development of the entire region. When viewed in the broader context of the administrative area includes the following municipalities: Sombor, Apatin, Bač and Bačka Palanka.

The whole area is characterized by still underutilized regional values, and the part that goes in the Republic of Serbia is the area of the Upper Danube, which causes the whole area to the cross border cooperation, as a condition for international competitiveness. Geographical position and strategic priorities of municipalities that fall within the region of the Upper Danube provides the opportunity to prepare policy documents and international cross-border type, ensure grant funds intended for the implementation of cross-border projects with Croatia.

Possibilities for development of agricultural activity lies in understanding characteristics of natural resources, the current state of their utilization, and the measures envisaged in order to improve production and environmental protection.

Upper Danube is characterized by flat and slightly hilly relief with the presence of erosive and accumulative forms: meanders, backwaters, old river courses, river islands and beams. Continuity of micro-and macro-relief causes major changes in vegetation composition and spatial distribution of plant associations. Climate of Upper Danube is beneficial for the development of agricultural crops, it is supported that the average long-term values of air temperature between 13 ° C in January to 10 ° C in July, with an average rainfall during the growing season, which is 360,6 mm of rainfall. The study area is characterized by the presence of different types of soil of which are the most dominant: chernozem soils, meadow soils, salt marshes and alluvial soils, which are dominated by the arable fields. Hydrography of the Upper Danube is very suitable, where the Danube River is the main watercourse of all municipalities in the 66 km long. For some municipalities represents natural border with the Republic of Croatia (Bač), while other municipalities located on the shore of the border village of great importance. Together with the rivers Mostonga, Žica, Berava, Vajiš, channel Karavukovo– Bački Petrovac (part of hydrosystem Danube - Tisa-Danube) and numerous artificial lakes, complete with a water potential of the entire area.

As one of the potential of this area is the fact that this region represents special nature reserve, which extends over 19.500 ha, of which 9.996 ha is on our side and is one of the largest protected natural areas in Europe. It consists of: Apatinski marsh, Monoštorski marsh, Štrpca, Kozara and Karapanda. It is known as a whole floodplain forest, numerous tributaries and canals, and ponds and meadows. Fauna present include: marsh deer, roe deer, wild boar, fox, otter, etc. Characterized by the presence of rare plant species, such as white water lily, yellow water lilies, winterling, *Hottonia palustris*, blue iris., Buttercup the barreland Black hawthorn, as well. As a signatory to the Ramsar Convention on Wetlands SNP Upper Danube are characterized by specific needs in the direction of preserving natural beauty, genetic resources and the expansion of surfaces

of the areas will be represented by a model of agricultural production, which will satisfy the principles of conservation of natural resources.

Organic farming is a model of conservation, protection and improvement of the existing agriculture. Promotes and enhances biodiversity, protect the environment and introduces the highest standards of animal and plant health. Taking advantage of the optimum quantity of natural resources, maintain and increase soil fertility, prevents erosion, reduce pollution from agriculture and eventually results in the production of food with high nutritional value. Upper Danube region has based export-oriented organic production of vegetables and field crops.

Using the provisions of Agenda 21 document, in which attention is focused on sustainable development, with a focus on making decisions that strengthen agriculture and enhances the environmental awareness of the people. With this decision was made that greater attention to the organic production method, and that the new regulations on the management of resources with respect to the adopted standards for this type of production. In the region of the Upper Danube is one of the five centers for organic production in Serbia. The center is housed in Selenča, Bač.

The need for a transition from the conventional methods of production of agricultural products to the organic production method, supported by the fact that the entire region of the Upper Danube dealing with the potential for agricultural production, both in the production of vegetable crops, and future orientation towards organic livestock production. The basis for the development of organic farming and organic products getting late, have knowledge of the potential of areas in which it is planning a future production. According to official statistical data on the territories of the Upper Danubian organization in agricultural land, most of the surface are the fields and gardens, observed in all four municipalities. In Table 1 presents will be used for agricultural lands, in 2010. year.

Table 1. Utilised agricultural area, 2010., in ha

	Agricultural area	Arable land and gardens	Participation of arable land and gardens in the agricultural area (%)
Sombor	101612	92849	91
Apatin	24479	20784	85
Bač	26899	23971	89
BačkaPalanka	48281	45145	93

Source: Municipalities and regions in R. Serbia, 2011, Statistical Office of the Republic of Serbia

Based on disclosed information, on the territory of the Upper Danube region there is a clear orientation towards agriculture to production, and almost the whole of the agricultural production in the area organize the arable land and gardens. The range of participation fields and gardens in agricultural surface ranges from 85% of the territory of Apatin, and to 93% in the municipality Bačka Palanka.

Table 2. The structure of sown arable area, 2010. years., (%)

	Cereals	Industrial crops	Vegetables
Sombor	60	27	2
Apatin	57	18	6
Bač	29	58	1
BačkaPalanka	51	33	6

Source: Municipalities and regions in R. Serbia, 2011, Statistical Office of the Republic of Serbia

In structure of total area planted, the highest incidence of the cereals, in the range of 29 - 60%, with the largest quantities of cereals products in the municipality of Sombor (60%), while the lowest are in the presence of crop structure in the municipality of Bač (29%). Production orientation towards the production of industrial crops has Bač, where the percentage of industrial plants in the crop structure 58%, while in other municipalities to participate significantly lower (18% Apatin, BačkaPalanka and Sombor, 33% to 27%). The lowest participation in crop structure has vegetables and the territory of the four municipalities observed.

Resources in fruit production and vineyard are limited to the territory of the municipalities surveyed. The largest share of the total orchard agricultural area compared to all observed Municipality is the municipality BačkaPalanka, a minimum area under orchards has Bač. With the shift from manufacturing aspect of winemaking, the territory of the municipalities surveyed, the largest share of the total agricultural area is the municipality Apatin (0.4%), while the other three municipalities have a share of 0.2%. (Table 3).

Table 3. Areas under the orchards and vineyards. 2010. year

	Orchards , ha	Orchards in agricultural land (%)	Vineyards, ha	Vineyards in agricultural land (%)
Sombor	628	0,6	214	0,2
Apatin	124	0,5	102	0,4
Bač	75	0,3	65	0,2
BačkaPalanka	490	1,0	113	0,2

Source: Municipalities and regions in R. Serbia, 2011, Statistical Office of the Republic of Serbia

What may appear as an obstacle to the development of organic farming in a wide range, is poorly developed livestock production. Livestock production devastation caused by poor investment projects for the whole of the Republic, as well as the lack of a secure market for the purchase of the obtained meat and meat products. Decline in livestock production are recorded in all livestock sectors, with particular emphasis on the pig. Although there are exceptional natural conditions for reorientation towards organic production of all types and breeds of livestock, was observed insufficient use of natural resources.

According to data from the Statistical Office of the meadows and pastures in the territories of the municipalities surveyed in the territory of Sombor (meadows - 3.6% of the total agricultural area in the municipality), while the largest following box pastures are located in the municipality of Bač (8%) and in the territory Apatin (7.8% of the total agricultural area of Apatin).

In observed municipalities there is a potential for the production of power plants, but also inadequate utilization for the production of biomass, biogas and bioethanol. Settling for the production of power plants will cause the autonomy of individual holdings in energy supply and a shift to the use of alternative forms of energy. Plants raised in such a way (canola, corn, etc.), may leave enough nutrients in the soil, which later can be a good basis for starting organic production.

Production of organic products will influence the positioning of the region, both from an economic standpoint, but also from the aspect of sustainable modes of production and environmental protection. This will pull together all of the postulates provided numerous collaborations at local and international level.

The European market has great needs for organic products, consumers are willing to set aside large sums of money for purchase of such products and that is the potential for anyone to organic production should be the main form of production in this region. Due to its geographical position, the Upper Danube region has the potential to create local and cross-border partnerships with neighboring countries maximize profits, and using organic production methods that protect the environment from pollution from agriculture, with optimum utilization of natural resources. In *Table 4* presents the categories of organic products in raw and processed form may be of interest to consumers.

Table 4. Organic products from the region of the Upper Danube region with significant market potential in the EU

Category	Products	Use
Cereals	Corn/wheat/barley/oat	Nutrition
Root plants	Potato	Food
Vegetable	Onions, beans, garlic, peppers, etc..	Market for fresh vegetables
Fruit	Apples, grapes, etc.	Processing market and fresh fruit market

Source: GIZ, 2011.

In order to achieve this kind of growth in agricultural production, it is necessary to follow and respect the framework conditions and trends. Compared with European countries, where the production of organic products has a long history, the total value of organic products from 11 billion euros in 2003. year, increased to 18 billion euros in 2009. year, which justifies the cost of this kind of production. As organic consumption to the EU grew faster than production, disproportionately increased imports from third countries. Retail sales of organic food reaches the value of 0.5 billion euros, as is the case in Austria, the Netherlands, Belgium, Spain and Denmark, 3 to 4 billion euros in Germany, Switzerland, France and the UK, so the market does not show signs of saturation, which may be the impetus for the expansion of organic farming in this region.

A special advantage that contributes to the development of organic production are local and cross-border cooperation of the Republic of Serbia and neighboring countries. Agreement on the establishment of cross-border reserve UNESCO biosphere and to protect the biosphere, nature, flora and fauna long river Mura, Drava and Danube, is one of the most important projects that will preserve the genetic basis and natural resources. Then the realization of cross-border cooperation between Serbia and Croatia - IPA (CBC Croatia-Serbia, 2007-2013.) and the between Hungary and Serbia (IPA project - Hungary-Serbia, 2007-2013), which aimed to increase cross-border exchange of goods, to develop labor market mobility, research, development, investment, preserving natural resources and the development of border regions of good relations between communities on both sides. In this way we'll get to linking markets in the region, which will be facilitated transport of organic products and as well as other products from the region. *"Adjoining municipality that has proximity and the easy access to potentially pan-European corridors X and the Vc and Corridor VII-Danube, is very attractive for investment, both large and the small producers. A good network of regional routes to all major sales centers and the processing further facilitate the distribution of manufactured products of primary production."* [7].

CONCLUSION

Organic farming is a sure way to improve existing production potential in the municipalities of the Upper Danube. Based on these results, the Upper Danube region has a predisposition to become the region with the organic production of plants and animals of different species and races, become a driving force of development. Favorable characteristics of relief and climate factors are the basis for the development and improvement of agricultural production. A special advantage is the proximity of the river Danube, which makes this region the local community (municipality of Sombor, Apatin, Bač and Bačka Palanka), are strategically positioned, which can create benefits for the establishment of cross-border cooperation with local communities in Croatia and Hungary. Combining the advantages of introducing organic production methods with the possibility that the end products are sold to the international market, which will cause the development of the entire region. Implementing the principles of organic production, will help preserve the environment, so it will be a reduction in pollution from agricultural waste (primarily pollution caused by nitrates and nitrites), it will cause the rational use of natural resources and biodiversity of plants and animals. Upper Danube Region is a special reserve of the first kind with a rich heritage of flora and fauna, which must be preserved. This is another reason why you should take organic agriculture as the basis for future development.

In all the municipalities of the Upper Danube there is widespread farming. The structure of the utilized agricultural land indicates that all observed municipalities, agricultural production is the highest percentage of organizing the fields and gardens. The most common crop structure is the production of grains (wheat, corn, barley), while production plants for industrial use is most developed in the municipality of Bač (58% of arable land). Vegetable production is least prevalent, regardless of the existence of water potential. Resources in fruit production and vineyards are limited to the territory of the municipalities surveyed. Investing in livestock production is very low, regardless of the livestock industry.

Advantageous geographical position of municipalities that develop along the Danube River, can potentiate the development of organic agriculture. Agreements that exist, aiming to link the cross-border community and to thereby establish a permanent exchange of goods and upgrade existing development. Recognizing the potential of local communities, the emphasis on food safety of organic origin, and may result in increasing the number of employees in the sector primary agricultural production and increase the availability of products in the markets of Western Europe. Agreements relating to the protection of the environment also can promote the sustainable development of the whole region, and organic agriculture can be more effective link between the protection of resources of the Upper Danube.

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