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VALUE CHAIN ANALYSIS OF REGION SPECIFIC ORGANIC PRODUCTS IN SERBIA

8

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Contents

Acronyms

CEFTA	Central European Free Trade Agreement
EUR	Euro
EC	European Commission
EFTA	European Free Trade Agreement
EU	European Union
FAO	Food and Agriculture Organization of the UN
GDP	Gross Domestic Product
GVA	Gross Value Added
Ha	hectare
HACCP	Hazard Assessment Critical Control Point
IPARD	Instrument for Pre-Accession Assistance for Rural Development
Kg	Kilogramme
L	litre
MPZŽSRS	Ministry of Agriculture and Environment of the Republic of Serbia
MT	Metric Tons
SORS	Statistical Office of the Republic of Serbia
SWOT	Strength Weaknesses Opportunity Threats
TOWS	Threats Opportunity Weaknesses Strength
UAA	Utilized Agricultural Area
VAT	Value Added Tax
VCA	Value Chain Analysis
WTO	World Trade Organization

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Foreword

The publication “Value Chain Analysis of Region Specific Organic Products in Serbia” is intended to be used by the stakeholders in organic sector in Serbia. It has been developed within the framework of the UN FAO Project GCP/SRB/001/HUN: “Assistance to the Development of Capacity and Support Services for Organic Agriculture in Serbia“, implemented by FAO and financed by Hungarian Ministry of Agriculture. The project is implemented in coordination with the Ministries of Agriculture and the Ministry of Education of Serbia.

The project aims to improve capacity of farmers and other value chain stakeholders in organic market oriented value chains through participatory training in farmer field schools and farmer business schools. That is further supported by strengthening of Center for Organic Production in Selenca which has been empowered to provide training and facilitation of market linkages and business development. Project visibility and awareness about organic agriculture was enhanced by numerous activities and publicity work of National Association for Organic Agriculture Serbia Organica.

Broader base of competences for organic agriculture has been supported by upgrading secondary education curricula for organic agriculture and inclusive practical training of teachers and high school students. Overall institutional environment for inclusive organic value chain development will be strengthened by participatory formulation of National programme for capacity development and provision of support services for region-specific organic production development.

The materials produced within the framework of the project have been tested and validated during the workshop and training sessions.

“Value Chain Analysis of Region Specific Organic Products in Serbia” was prepared by Zorica Sredojevic.

We gratefully acknowledge contributions of all participants and principal authors, as well as all project team members: Aleksandar Mentov, National Project Manager; Olga Keselj and Bratislav Stamenkovic, National Consultants; Zhupan Martinovski and Vladislav Popov, International Consultants; Gyongy Kurthy, International Team Leader; as well as Nevena Aleksandrova and Stjepan Tanic from FAO Regional Office for Europe and Central Asia for their technical guidance and supervision of project implementation. The manual layout and design were prepared by Alexander Swanwick.

1. EXECUTIVE SUMMARY

The present study is a report of the project GCP/SRB/001/HUN *Value chain analysis of region specific organic products in Serbia*. Given the available natural resources in certain production regions of Serbia, the cultural level, achieved level of development and professional competence of farmers/agricultural producers, this study has a systematic approach to the analysis of the actors in the value chain of organic products and those that can support their development. The study considered the positions and possibilities among the stakeholders along the value chain that can contribute to the increase of income generated by the organic producers and other actors in the chain, as well as to improve access to organic products by consumers.

The structure of the analysis of specific value chains for products depends on the type of product development of the chain, i.e. the level of production technology, processing and refining, marketing, logistics, etc. A key part of this study makes an The analysis of the value chain of selected individual products region-specific for major production lines according to the Draft Study Assessment of the capacities in organic farming for the region specific organic products in Serbia, prepared for FAO, 2014. Four regions are identified, namely: Vojvodina, Western Serbia, Southern Serbia and South-eastern Serbia. For the region of Vojvodina, the value chain for two vegetable products in primary production was analysed, namely the tomato and spice paprika. In the region of Western Serbia, blackberries and raspberries were selected as region-specific products in organic fruit production, and the analysis of the value chain carried out. Plums and cherries were selected as representative of the region of Southern Serbia, while the region of Southeast Serbia is oriented towards livestock production. Also in this region the value chains for milk and meat in organic livestock production were analysed. For all chains appropriate calculative, statistical and other methods were used, and finally the SWOT analysis.

The factors affecting the efficiency and competitiveness of the value chains of organic products were identified in the study, suggestions and a series of recommendations offered that could contribute to improving the economic and financial performance of stakeholders in the chains. In the last few decades in the world and Serbia, the products with added value are increasingly in the focus of attention. In order to achieve better profitability, activities aimed at either improvement or elimination of so called "bottlenecks" in the value chain of organic products have been identified in this analysis. For example, purchasing of inputs, support for connecting producers and connecting producers with certification companies, marketing and promotion of products, providing market information, the introduction of standards and other types of support, etc. Similar activities are related to organic products that are specific in regard to their geographic origin, which is important for a systematic approach to the analysis of the region. The promotion of the region with its culture, traditions and products can result in significant benefits, both economic and social. Products that bear a specific "seal of the region/area" can increase the income of all participants in the value chain and contribute to the sustainable development of agriculture in the region.

The purpose of the given analysis is to create guidelines that will adequately determine/convince the producers or company management teams, but also politicians and scholars who deal with these issues, to contribute to the further development and improvement of business in organic production, as well as the larger and economically comprehensive representation of organic production in Serbia. It can contribute to improving institutional capacity development to support

organic agriculture with special focus on the establishment and strengthening of business support services, etc. Despite the progress in the field of organic production in Serbia, and greater opportunities for growth through expansion of its product value, processing and some new markets, there are some obstacles in the value chains of products. In the present study, the guidelines are given for further commitment of stakeholders in the value chain of organic products, as well as for the preparation of the National Programme for capacity development and provision of support services for region-specific organic products (NPCSOP), Action Plan and other national documents of importance for organic production in Serbia.

2. INTRODUCTION

Organic agriculture refers to systems of agricultural production in which the dominant economic principles are adjusted to environmental requirements. Organic agriculture differs significantly from the usual conception and methods of production, in terms of formulating business objectives of agricultural enterprises or farms, which are: to maximize the overall economic performance of enterprises (farms), while achieving ecological optimum at the same time. Organic agriculture is determined by the standards defined within the International Federation of Organic Agriculture Movement - IFOAM, which was founded in 1972. EU documents (Directive 2092/91, revised in 1999) as well as Serbian legal acts were based on these principles.

The first steps in organic production development were taken back in 1990, when the non-governmental organization (NGO) Terra's established a promotional network of producers, farmers, advisors and academic staff involved in organic food production. The association Terra's became a member of IFOAM in 1992, and in 1997 it hosted a conference on organic production in Central East European countries. Since then, the association Terra's from the municipality of Subotica has become the driving force behind the development of Serbia's organic sector. Later on, other formal and informal groups promoting this method of production began emerging elsewhere in the country as well.

The first Law on Organic Agriculture in Serbia was passed in 2001, while it was still part of the Federal Republic of Yugoslavia. Following the change of government in 2000, foreign investments started coming in, with buyers, projects and donors bringing knowledge and export possibilities as well. Avalon from Netherlands, SIDA from Sweden and Diaconia from Germany were the first foreign organizations to promote organic farming in Serbia with regional projects. In 2003, German Agency for International Cooperation (GIZ) supported Terra's in establishing cooperation with the German certification body BCS, thereby laying the foundation for the first certification body in Serbia. In 2004, GIZ supported the first participation of Serbian traders and processing companies at the Biofach international bio-fair in Nuremberg, Germany. Together with the Green Network of Vojvodina, Terra's started the development of the local market and, as a result, the first Biofest was held in Subotica in 2005. In subsequent years, the United States Agency for International Development (USAID) in cooperation with the Ministry of Agriculture, Forestry and Water Management (MAFWM) also supported participation of Serbian producers and businesspeople at the Biofach fair. In 2006, the MAFWM joined the Mediterranean Organic Agricultural Network and shortly afterwards a cross-border project on organic agriculture, financed by the EU and various Mediterranean countries, followed. In 2006, the Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia was supported by the Network for organic production, the Mediterranean and soon after realized the international organic farming project that was funded by the EU and several Mediterranean countries.

The majority of these international organizations recognized the potential of organic production in Serbia and facilitated the establishment of new organic associations, primarily on local and regional levels. Several companies began working on export-oriented organic production. In 2007/08, donor support for the development of the organic sector continued with various projects. Austrian Development Agency (ADA) focused its activities on regional rural development in Vojvodina and Sandzak, trying to amalgamate small-scale organic farming with community development and local processing of agricultural raw materials. Swiss Development Corporation (SDC) embarked on a major program for introducing food safety standards such as HACCP and Global GAP. GIZ concentrated on policy advice, donor coordination and buildup of

business associations. The importance of the projects approved in 2013 by the EU should also be emphasized, on the cross border cooperation, “Pannonia Organica”, and the project by FAO to support the development of organic production. Government of Norway has launched a project for value added products (organic products and products with geographic origin).

In 2009, a national association on organic agriculture, Serbia Organica, was founded with the goal of uniting the sector’s participants under a joint objective and mandate, stimulating interaction and promoting organic farming and processing, both in the country and abroad. The National Association “Serbia Organica” (NASO) currently gathers around 80% of the participants in the sector of organic production in Serbia, who are also present in other related associations and organizations, a large number of members come from primary production, processing, trade, academic and other institutions. With the support of many local and international institutions, ministries, technical organizations and investors, the sector of organic production in Serbia has reached significant results. Product portfolio mostly consists of fruit and field crops, with a constant production growth of cereals and oilseeds. Most of these products are exported, for the most part to the EU, since the domestic market is underdeveloped. However, there is an increasing support and incentive for the development of the domestic market, but all of this is still insufficient due to the low purchasing power of consumers.

There are three categories of farms involved in organic production in Serbia. The first category refers to small eco-farms, which are good examples of integrated vegetable and animal production. The second category includes specialized farms such as the ones for the organic crop production and organic production of fruit, which does not represent the most optimal option, both in terms of business and environment. The third type of organic production refers to large eco-farms which combine crop and livestock production on large areas and are also associated with the processing.

Over the last few decades, around the world as well as in Serbia, there has been a significant increase in the demand for the products which, in addition to the basic safety standards, are in some way specific, such as organic products and products with a protected geographical origin. There has also been more talk about value added products. In order to achieve better profitability, it is necessary to assess and eliminate the activities of the so-called "bottlenecks" in the value chain of such products. For example, it could include a purchase of inputs, product promotion, support for connecting producers and providing connection with certification bodies, support for trade fairs, providing market information, the introduction of standards and other means of support, etc. Similar activities are included in the protection of the geographical origin, but it should be a more regional approach. By promoting the region or the area with its culture, tradition and products, significant benefits can be achieved, both economic and social. Promotion of the region and the products which bear a specific "area seal," may increase farmers' income and contribute to the sustainable development of agriculture.

2.1. The gist of the concept of value chain analysis

The value chain is a powerful tool for finding ways to create larger "added" value to the products. The structure of the value chain represents the synthesis of activities performed in order to complete production, packaging, design, marketing process, delivery and for providing support to its products. Various relevant activities can be identified within the value chain of agricultural products. These activities are grouped into primary, such as the introduction of inputs in the production - input logistics; transforming inputs into the final products - production; transportation and shipping of the final products - the output logistics; marketing and sales; services and etc., as well

as support activities or ancillary activities such as technology development, human resource management, organization infrastructure, etc.

Modern terms for doing business constantly bring changes and cause for all market participants to accept innovation as a business orientation. Consequently, this leads to an improvement in a number of business activities, but also to creating completely new activities, which are, with their elements, trying to rise to the challenges and obstacles of the turbulent environment. The product value chain is a good example, which is subject to various challenges and changes. Using the value chain model, the costs and effects of each activity which affects the value are analyzed, and ways for improvement are researched. The features and characteristics of a product which are demonstrated by its ability to satisfy the stated or implied needs are directly aimed at the buyer/consumer. The buyer is generally not able to accurately determine the value of a particular product. By purchasing the product, the buyer estimates benefits which he received for the incurred cash expenditures. The satisfaction of the buyer with the actual product depends on how well the product met his expectations. The results of empirical research of consumers indicates that when a consumer is satisfied with a certain product, he informs up to five other current or potential consumers about it, while a dissatisfied consumer informs more than other fifteen current or potential consumers about it.

Due to the achieved level of development, the available natural resources in different production regions, cultural awareness and professional competence of agricultural producers, as well as a sense of the needs of producers, especially political factors for systematically taking measures to increase the volume of production, this study has implemented a systematic approach and analysis of the participants in the value chain of organic products and those who can support their development. Despite progress in the sector of organic production in Serbia and greater opportunities for its growth through expansion of its product value, processing and some new markets, there are certain obstacles which affect its development. The study analyzed the positions and possibilities of the participants along the value chain which can increase income of the producers of organic products, as well as improve consumers' access to organic products.

2.2. Scope and purpose of the study

According to the *Draft of the study Assessment of the Capacities in Organic Farming for the Region* Specific *Organic Products in Serbia*, prepared for FAO (Keselj, 2014), the following four regions have been identified: Vojvodina, Western Serbia, South Serbia, and South-eastern Serbia, as well as the most important organic products by regions. According to this source, as well as other available information, value chain analysis of specific organic products according to identified regions has been conducted. Therefore, the main objective of this study is value chain analysis of selected products specific to the leading organic production in certain regions of Serbia. The main objective of this study is to identify factors that affect the efficiency and competitiveness of the value chains of organic products, to make proposals and a series of recommendations that could contribute to improving the economic and financial performance of the participants in the value chains. The structure of the analysis of certain value chains according to products depends on the type of product, chain development i.e. the level of production technology, processing and refining, classification, logistics etc. Elements of the analysis for all of the products are as follows:

- Procurement of inputs and organization of organic production;
- Changes in manufacturing technology during the transition to organic production and how they affect the input - output relations and achieved economic results;
- The yield generated from the transition from conventional to organic production;

- The use of available factors of production, especially agricultural land, technical means of production and labor in organic production;
- The amount of investment in farming or production and their impact on the economic effects from the producer's point of view;
- The possibility of processing products from primary production;
- The market elements and the possibility of placing the final product;
- The possibility for interconnection, association and cooperation, horizontally and vertically, of all of the parties involved in organic production;
- Institutional capacity development for providing support for organic agriculture with special focus on the establishment and strengthening of business support services etc.

The purpose of the given analysis is to create guidelines which will properly influence the producers or management of companies, and also politicians and scholars who deal with these issues, to contribute to the further development and improvement of conducting business in organic production, as well as for the larger and economically expedient representation of organic production in Serbia.

2.3. Data source and methodology

Research methodology includes the use of different statistical and method calculative gross margin for solving such tasks and problems in science and practice. In addition, by using the abovementioned methodology, the comparison of organic production with the same type of production in the conventional sector was conducted, and where possible, the comparison with the organic products from other countries. In order to obtain a more complete picture of the satisfaction of producers and consumers, primary data was also collected through interviews of major participants in the value chain, ranging from producers to consumers.

In addition to these data sources, the secondary internal information was also used, which was included in internal databases, web sites, via e-mail from farms/entities, regarding the technology of production or processing, procurement of inputs, consumers, etc. In doing so, the measurement and analysis used a variety of methods and techniques, ranging from the simplest - such as absolute and relative numbers, percentages, rates, indices, up to very complicated techniques. The choice of the measurement methodology, during the interpretation of the results, took into account certain parameters of the consumers of the products of major competitors. Also, the data sources included statistical and other publications, both from domestic and foreign literature. The results are shown in tables, graphs, by using pictures, diagrams etc., along with the appropriate interpretation. Based on the economic results achieved in the abovementioned terms of organic production in Serbia, the aim of the study is to demonstrate the economic feasibility of investing in increased capacity.

2.4. The structure of the study

The structure of this study is composed of several major units. In the introductory part, common problems related to the organic production and its development in Serbia, are explained. After that, the concept and importance of the value chain are analyzed, as well as its terminological and substantial differentiation in relation to the concept of logistics management. Then, the process of value creation that takes place in every chain, if it is properly managed, is explained. Encouraging the process of value creation is done through various optimizations that occur in many places and levels between parties involved. In order for the participants in the chain of organic products to be able to continue to create additional value, it is important to take into account the challenges that the future holds.

In the next part of the study, the macroeconomic environment of organic production in Serbia is explained. The general information is provided - size, climate and soil conditions for agriculture in general, important parameters regarding the population, as well as key economic indicators of the development of the country etc. Afterwards, regions in Serbia, which are specific for certain type's organic production, have been identified, and then some general information for each region has been provided. The proposal presented in the draft of the study for FAO (Assessment of the Capacities in Organic Farming for the Region Specific Organic Products in Serbia) has been used.

An analysis, of the value chain of selected individual products which are specific for major production regions in Serbia, is a key part of this study. Thus, in the region of Vojvodina, the value chain analysis has been conducted for two vegetable products - tomato and spice paprika. In the region of South-eastern Serbia, Serbia blackberries and raspberries were selected as specific products, and the value chain analysis for them has been conducted. Plums and sour cherries were selected as representatives of the region of Southern Serbia, while the region of South-western Serbia is known for livestock breeding. Value chains for two products of organic livestock production have been conducted for this region. The appropriate calculative, statistical and other methodology has been used for all of the chains.

Finally a SWOT and TOWS analysis has been performed. A SWOT analysis (alternatively is a structured used to evaluate the strengths, weaknesses, opportunities and threats involved in value chain analysis of region specific organic products in Serbia. The TOWS matrix identifies in external opportunities and threats and compares them to a company's internal strengths and weaknesses and other factors of importance to the support and further development of organic production. The final part of the study is devoted to a summary conclusion of the analyzed value chains. Based on the given problems, various suggestions for overcoming them have been given, and opportunities for improvement and development of a single production, as well as the entire organic production in Serbia. In addition to the main part, the appendices at the end represent an integral part of the study.

The results of the analysis should provide guidelines or a roadmap to all of the interested parties, who wish to conduct and improve organic production. This type of analysis should be beneficial for producers and companies, which certainly insufficiently recognize or use the techniques and the concept of the value chain. The study, to a quite a large extent, covers the creation of guidelines for further determination of the parties included in the chain of organic products, as well as for the preparation of the Action Plan and other national documents of importance to organic production.

3. ENABLING ENVIRONMENT AND AGRICULTURAL POLICY TO ORGANIC FARMING

3.1. Macroeconomic and natural factors of Serbia

The Republic of Serbia is a landlocked country that is partially located on the Balkan Peninsula – in South Eastern Europe (around 75% of the territory), and partially in the Pannonia Plain – in Central Europe (around 25% of the territory). The territory of Serbia covers an area of 88,361 km^2, which consists of various types of terrain, ranging from vast plains in the north, and the hilly terrain and valleys in the south, to the mountainous areas in the western, southern and eastern parts of the Republic. In the south, Serbia is surrounded by the following mountain ranges: Tara (2,640 m), Montenegro (1,490 m), Kozjak (1,280 m) and Dukat (1,829 m). In the west, it is surrounded by the following mountain ranges: Koritnik (2,394 m), Prokletije (2,656 m), Javorje (2,656 m), Mokra Gora (2,155 m), Zlindar (1,616 m), Kamena glava (1,463 m), Zvijezda (1,444 m) and Jagodnja (940 m). In the east, it is surrounded by the following mountain ranges: Besna Kobila (1,922 m), Lužnica (1,461 m), Vidlič (1,583 m) and Stara Planina (2,169 m). Due to various types of terrain and its exposition, different soil types can be found. Soil characteristics in Serbia are caused by the increasing number of natural factors such as physical-chemical properties, geologic substrate, hydrological and hydrographic conditions, orography, climate, vegetation, presence of macro and micro-organisms.

Climate of the largest part of Serbia is moderate continental. The precipitation has two seasonal peaks, with frequent and heavy rains. The primary peak occurs in the summer (in June) and the secondary in autumn (in November), while the winter is quite dry. The southwestern part of Serbia lies on the border of the Mediterranean climate (large amounts of precipitation in the winter, cold winters and hot and dry summers) and continental climate. Mountain ranges that surround the area are interspersed with river valleys which cause modification of climate, both in the Mediterranean (in the west) as well as in the continental (in the north and east). Moderate continental climate is present in the northern part of the Republic of Serbia (in Vojvodina). The main characteristics of this climate include hot summers and cold winters, with annual average temperature variations of over 22° C (from January to July). Autum is warmer than spring in this area, in average by around 0.7 °C, and winter-to-summer seasonal transition is much sharper than summer-to-winter. The central lowland parts of Serbia have a similar climate. The mountain climate exists on the middle and high mountains.

The precipitation regime is very heterogeneous in different areas. The amount of annual precipitation ranges from 500 mm in the north, to over 1,000 mm in the mountainous regions, while the average precipitation in Serbia is around 730 mm/year. In lower regions, the precipitation is below 800 mm, whereas it increases with increasing altitude, with vertical gradient of 25 mm/100 m to 40 mm/100 m. The total annual precipitation differs in accordance with the area. The minimum annual precipitation is registered in the sub-basins of Juzna and Velika Morava rivers, as well as on the territory of Vojvodina. A reduced amount of precipitation has been recorded going from west to east. Almost in the entire territory of the Danube basin in Serbia, the most of the rain occurs between May and July, and the least between January and March. In general, June has the most monthly rainfall, while February and March have the least. In addition to precipitation, it is important to mention the temperature trends. In the northern part of Serbia, the average annual air temperature ranges from 10.8 °C to 11.5 °C, and in the lower areas of the central and southern parts of Serbia from 10 °C to 12.1 °C. Lower temperatures are characteristic for the hilly and

mountainous regions. Average annual temperatures decrease linearly with increasing altitude, with vertical gradient of -0.6 °C/100 m.

3.2. Social and economic factors

Population-The Republic of Serbia is one of the medium populated European countries. According to the last census, the total population in Serbia is 7,186,862 (excluding Kosovo), i.e. there are 92 inhabitants per km^2 (SORS, 2011). Based on the same data, the population in Serbia has been reduced by 311,139 (or 4%) since 2002. The following has occurred during the last decade in Serbia: population regression, i.e. a reduction in the total population, a decline in the birth rate, an increase in the mortality rate, the concentration of population in urban areas and emptying of rural areas, as well as specific demographic aging of the population. Distinct depopulation trend is typical for, above all, underdeveloped and border municipalities, and it leads to complete depopulation of these areas.

According to the data of the Statistical Office of the Republic of Serbia regarding the age structure of the population, the population under 14 accounts for only 13.9%, the largest share includes population from 14 to 64 (66%), while people over 65 accounts for 20.1%. According to the census from 2011, in the territory of Serbia 4,710 settlements were recorded, which is 3 more than according to the previous census. The average number of residents per settlement is around 1,530. Most of the settlements have less than 2,000 inhabitants (around 90%) and 1.8 million people live in them (around 25% of the total number), while the number of inhabitants in settlements with more than 100,000 people accounts for around 20%. Migration processes were recorded in the settlements with less than 10,000 inhabitants. The degree of urbanization of a large number of settlements, i.e. the level of social and community standards of the largest fraction of population, is not satisfactory.

Gross domestic product and other economic indicators- Gross domestic product (GDP) is the best indicator of business and economic trends in Serbia in the past. During the five-year period, from 2008 to 2012, the value of the most important indicator of the national economy and the indicator of productivity and efficiency in the production of goods and provision of services required for different types of consumption in Serbia, is displayed in Table 1.

Table 1 *Gross domestic product (GDP) in Serbia, 2008-2012*

NO.	INDICATOR NAME	AMOUNT					
		Unit	2008	2009	2010	2011	2012
1	Gross domestic product (GDP)	RSD BN	2,661	2,720	2,882	3,209	3,349
2	Gross domestic product (GDP)	EUR MM	32,668	28,957	27,968	31,472	29,601
4	GDP per capita	EUR	4,445	3,955	3,836	4,351	4,112
5	Real GDP growth rate in %		3.8	-3.5	1.0	1.6	-1.5
6	Industrial production trends	%	1.1	-12.1	0.0	2.5	-2.2

Source: Statistical Office of the Republic of Serbia (SORS), 2013

As a result of the negative effects of the global financial and economic crisis on the Serbian economy and finance, during the second half of 2008, the economic activity and foreign trade slowed down, and decreased afterwards. Reduced capital inflows from abroad also caused a decrease in foreign and domestic demand, due to cautious investors and deteriorating conditions in the global financial markets. Recession wave had the largest impact on the industrial production in Serbia, and thus, during the crisis in 2009, a decline by 12.1% was registered. Number of employees in

the industry was cut in half (Table 2). There continued to be a decline in a large number of economic activities, mostly in the construction industry, even after 2009, apart from the agriculture and service sectors.

Table 2 *Some macroeconomic indicators in Serbia, 2008-2012*

NO.	INDICATOR NAME	AMOUNT					
		Unit	2008	2009	2010	2011	2012
1.	Trade deficit	EUR MM	-9,049	-5,543	-5,729	-5,809	-5,587
2.	Foreign direct investment, net	EUR MM	1,824	1,373	860	1.827	232
3.	Investment ratio	% GDP	21.9	16.6	17.1	18.3	14.6
4.	The growth of consumer prices, annual average	%	8.6	8.4	6.5	11.0	7.5
5.	Number of employees, average	Thous.	1,999	1,889	1,796	1,746	1,725
6.	Unemployment rate	-	14.4	16.9	19.2	23.0	23.9
7.	Net earnings, period average	RSD	32,746	31,733	34,142	37,976	41,377
8.	Real growth of net earnings	-	3.9	0.2	0.7	0.2	1.0

Source: Statistical Office of the Republic of Serbia (SORS), 2013

In the structure of the gross domestic product of Serbia in 2012, business services had the largest share, which accounted for 61%, industry accounted for 24%, agriculture, hunting, fishing, and forestry accounted for 10%, and construction accounted for 5%. The constant decline in the share of agriculture in gross national income (GNI) structure was not caused by the reduction in the value of agricultural production, but instead by the development of other sectors. In 2001, the total value of agricultural production amounted to RSD 135.08 billion (at constant 2002 prices), which accounted for 15.7% of GDP, while in 2006 the realized value of agricultural production amounted to RSD 200 billion which accounted for 9% of GDP, up until 2011, in which RSD 248 billion accounted for 8,5% of GDP.

Sectors which produce tradable goods (agriculture, manufacturing) during the last five-year period had below-average growth rates, while the leading service sectors (trade, information and communication, and financial activities) recorded above-average growth rates. This period has been characterized by a decrease in the amount that manufacturing and tradable goods accounted for in GDP, while the service sector has become a major generator of economic growth. Underdevelopment of tradable-goods sector has influenced a more rapid growth of imports than exports, and so the observed period is also characterized by the high import dependence and the low share of exports in GDP (around 25%). Investments did not provide export growth in tradable goods, which was supposed to lead to the reduction of foreign debt. The current investment activity in comparison to development needs is still at a low level, even though there is a somewhat improved macroeconomic environment.

3.3. General characteristics of certain regions of Serbia

Vojvodina covers an area of 21,506 km^2 with a population of 1,931,809 (21.56% of total population of Serbia). It borders Hungary to the north, Romania to the east, Croatia to the west, and Bosnia and Herzegovina (Republika Srpska) to the southwest. The southern border of Vojvodina is an administrative border with central Serbia, which mainly consists of the Danube and Sava. The largest city in the province is Novi Sad, which is also the administrative center of Vojvodina. Other major cities (with over 50,000 inhabitants) include Subotica, Zrenjanin and Pancevo. Vojvodina lies on the Pannonian Plain, and covers the area of 21,506 km^2, with the population of around two million inhabitants. Vojvodina consists of three geographical regions: Banat, Backa and Srem, and a small northern part of Macva region. Most of Vojvodina area is a flat terrain, but there are several mountain areas such as Fruska Gora in Srem, and Vrsac Mountains in southeast of Banat. The lowest point of Vojvodina is 75 m, and the highest 641 m. The Danube with its tributaries represents the biggest hydro potential, as it is the most important waterway and it provides the strategic direction of traffic in Central Europe. The length of Danube in Serbia is 588 kilometers, and for the most part it passes through Vojvodina, and is navigable along its entire length. Its tributaries are also navigable: Tisa (168 km), Sava (206 km) and Bega (75 km), among which an extensive network of canals for irrigation, drainage and transport exists, the Danube-Tisa-Danube Canal, with a total length of 939 km, out of which 673 km are navigable. In geographical terms, the term Vojvodina can refer to the parts of Srem and Banat which belong to the city of Belgrade (Pancevacki Rit, Zemun, New Belgrade, Surcin), and in a historical sense, this term has also referred to parts of Srem, Backa and Banat, which nowadays belong to Croatia, Hungary and Romania, and it has also referred to the area of Baranja.

Vojvodina is composed of 41 municipalities and 6 cities, which are divided into seven districts. District seats are in Novi Sad, Subotica, Zrenjanin, Pancevo, Sombor, Kikinda and Sremska Mitrovica. There are 1,289,635 (or 66.76%) of Serbs in Vojvodina, and they represent the majority of the population of this northern Serbian province. The economy of Vojvodina is based on the abundant wealth of fertile arable land which covers 84% of its area, and whose natural fertility is improved by the irrigation network, and thus out of 1.78 million hectares of arable land, around 0.5 million have been drained. Around 70% of the yield from these fields goes to cereals, 20% to industrial herbs, and 10% to other cultures. Certain products are exported, but most of them are processed in the domestic food industry, which is mainly stationed in Vojvodina (plants for processing meat, fruit and vegetables, oil, sugar, and dairy factories, etc.). There is also a high level of industrial development. Part of the income of Vojvodina comes from tourism, which is especially developed on the rivers and lakes, hot springs and Fruska Gora Mountain.

The city of Belgrade has the status of a separate territorial unit in Serbia, with its own local government. Its territory is divided into 17 urban municipalities, each of which has its own local government. Belgrade occupies 3.6% of the territory of the Republic of Serbia, and is inhabited by 21% of the citizens of Serbia (excluding Kosovo and Metohija). Belgrade is also the economic center of Serbia and the center of Serbian culture, education and science. According to estimates of the Statistical Office of the Republic of Serbia from 2008, a total of 1,621,396 inhabitants live on the territory of the city of Belgrade. Out of that, 1,322,629 people live in urban areas and 298,767 in rural areas. Geographically speaking, the city of Belgrade consists of two quite different parts. North of the Sava and Danube is a large flat area which belongs to the Pannonian Plain. South of these two rivers is the hilly and mountainous territory of Sumadija. In the central part of Sumadia district, and the city itself, a chain of mountains of Sumadijski venac passes through, which begins on the south side with Rudnik, then continues to Bukulja, and then goes along the territory of the district Kosmaj-Avala-Vračarski plato-Belgrade Fortress. Two large rivers flow

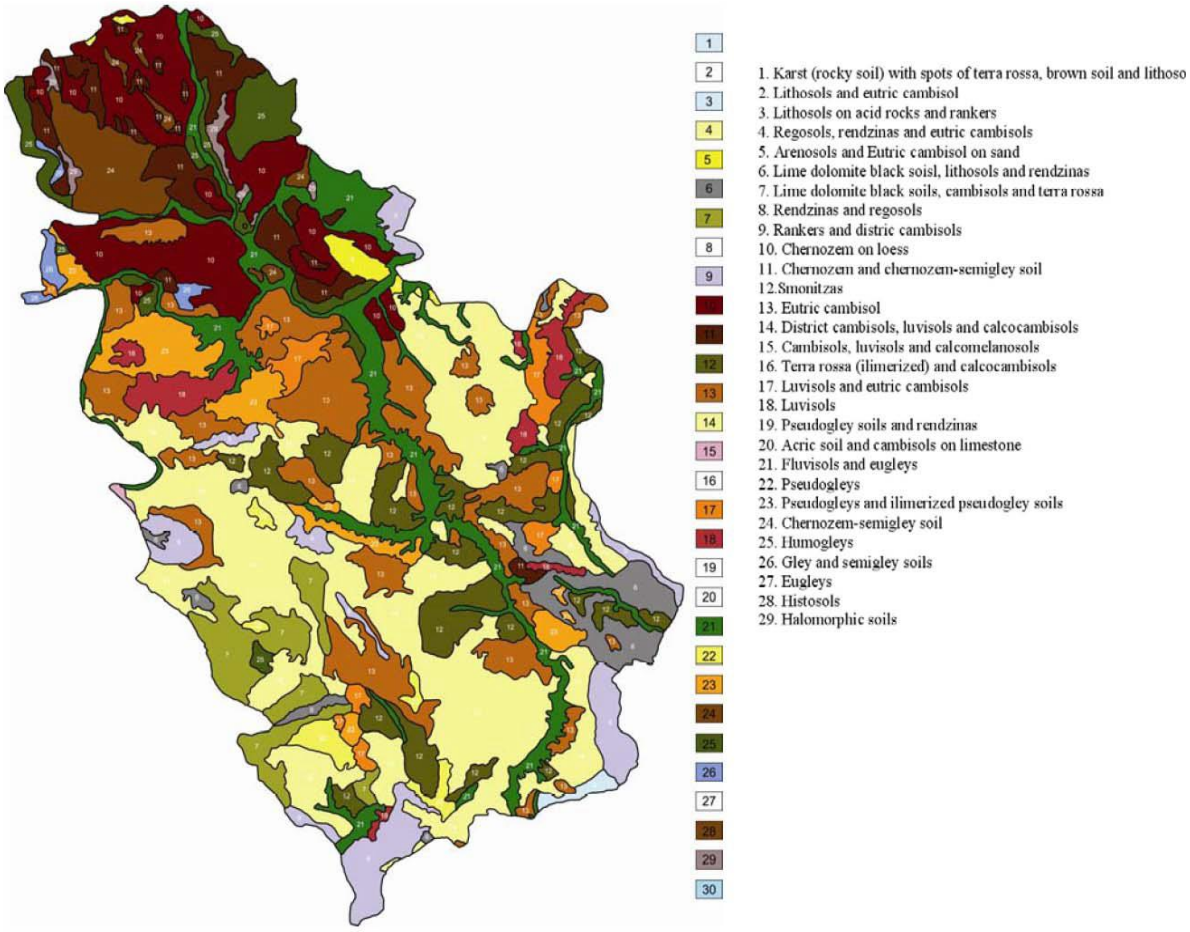
through the district, the Sava and the Danube, but also a large number of smaller rivers. The city itself certainly represents the main source of economic power. However, the largest territorial part of the district is comprised of rural and agricultural areas. The northern, Pannonian part of the district is known for vigorous and well-developed agriculture. The southern part is, in addition to agriculture, very famous for its fruit production and excellent vineyards in the Danube and Sumadija parts of the district.

Sumadija and Western Serbia is one of the five statistical regions of Serbia. This is the largest statistical region by: population (2,031,697 according to 2011 census); the area that it covers (26,483 km^2) and the number of settlements (2,111). The region is composed of several spatial geographic areas, out of which the more significant ones are: Sumadija, Raska/Sandžak, Stari Vlah, Macva, Podrinje, Pester, Posavina, Pomoravlje, Zlatibor, etc. The Serbian population mostly prevails in the region, while in Sandzak considerable amounts of the Muslim population are present. Bosniaks are an ethnic majority in the municipalities of Novi Pazar, Tutin and Sjenica.

Southern and Eastern Serbia is a statistical region which is composed of several spatial geographic areas, out of which the more significant ones are: Pomoravlje, Podunavlje, Ponisavlje, Branicevo Timocka Krajina, Toplica, Jablanica, Sopluk, etc. Serbian population mostly prevails in the region, but members of other ethnic groups are also present: Bulgarians, Albanians, Vlachs, Roma, etc. Albanians represent an ethnic majority in Presevo and Bujanovac municipalities, while Bulgarians represent the absolute ethnic majority in the municipality of Bosilegrad and a relative majority in the municipality of Dimitrovgrad. According to census data from 2011, the region had a population of 1,563,916. According to the census, Serbs, Roma, Vlachs and Bulgarians represented the largest ethnic groups.

Serbia is characterized by an unequal regional development. The regional participation in Serbia's GDP differs from one region to another. According to the data of the Statistical Office of the Republic of Serbia, the region of Belgrade takes the first place and accounts to 40% of GDP, the region of Vojvodina accounts to 27%, the region of Sumadija and Western Serbia accounts to 19%, and the region of Southern and Eastern Serbia accounts to only 14%. An equal regional development would require taking appropriate measures in the field of infrastructure development, creating incentives for an enticing business environment, for example: offering favorable loans, business incubators, etc., as well as training employees to implement development projects. Land as a basis for economic and social prosperity of the country and conditionally renewable resources requires special attention. The country has a very high quality land suitable for agricultural production. Specifics of land by regions in Serbia are involved in all of the framework strategy: Regional Development Strategy, the Sustainable Development Strategy, Poverty Reduction Strategy, and others.

Figure 1 *Soil map of Serbia (1: 200 000)*



Source: http://eusoils.jrc.ec.europa.eu/esdb_archive/eusoils_docs/esb_rr/EUR22646EN.pdf

3.4. Agriculture in Serbian economy

Serbia's natural resources make it a country with respectable capacity for a growth of its agri-food sector's productivity and competitiveness. The contribution of agriculture to the Serbian economy is considerable. Over the last decade the share of agriculture in GVA decreased from over 12% to about 10%, whereas the share of agriculture in employment remains over 20% (Table 3).

Table 3 *Some indicators the role of agriculture in the economy of Serbia, 2005-2012*

INDICATORS	UNIT	2005	2006	2007	2008	2009	2010	2011	2012
GVA of the agriculture, forestry, hunting and fishery sector									
GVA (at current prices)	mill EUR	2,023,9	2,188,4	2,443,5	2,915,9	2,320,4	2,379,0	2,873,2	2,624,4
Share in GVA of all activities	%	12.1	11.3	10.3	10.6	9.6	10.2	10.9	10.4
Employment in the agriculture, forestry, hunting and fishery sector									
Number	000	636,4	537,6	549,8	706,0	622,7	533,0	478,1	467,1
Share in total employment	%	23,3	20,4	20,7	25,0	23,8	22,2	21,2	21,0
Trade in food and agricultural products									
Export of agri-food products	mill EUR	748,0	1,008,0	1,231,0	1,336,0	1,395,0	1,700,0	1,956,0	2,131,0
Share in export of all products	%	20.3	19.4	18.9	17.9	23.2	22.6	22.7	23.7
Import of agri-food products	mill EUR	655,0	767,0	871,0	1056,0	991,0	819,0	1,053,0	1,221,0
Share in import of all products	%	7.4	6.9	4.3	4.6	6.3	7.2	7.0	7.7
Trade balance in agri-food products	mill EUR	93,0	241,0	360,0	280,0	404,0	881,0	903,0	910,0
Agri-food export to import ratio	%	117,6	137,6	197,5	175,1	194,3	186,6	191,9	184,1

Source: Statistical Office of Republic of Serbia (SORS), 2013

Agriculture contributes significantly to the country's trade balance. The agricultural and food export share in total export is about 20%.

The resources of arable land and the structure of agricultural holdings – Serbia has favorable natural conditions for agricultural production. According to the census of 2012 in Serbia has 3,861 million hectares of agricultural land, out of which 3,437 million hectares (89%) is utilized agricultural area (UAA). UAA is accounting for 44% of the Serbian total area and about 2% of the EU-27 UAA (Table 4).

Table 4 *Agricultural land use indicators in Serbia and EU-27*

INDICATORS IN %	SERBIA	EU-27
Share of UAA in total area	44,30	39,60
Share of arable land in UAA	73,10	59,80
Share of permanent grassland in UAA	20,75	34,00
Share of permanent crops in UAA	5,45	6,10
Indicators in ha		
UAA per 1,000 population	478,29	344,80
Arable land per 1,000 population	353,91	206,30

Source: Statistical Office of Republic of Serbia (SORS), 2013 and Eurostat, 2012

In the structure of agricultural land in Sebia as in EU-27 the largest share occupies arable land. By data of Statistical Office of Republic of Serbia, the average farm size is 5.4 ha UAA, which is 2.7 times under the EU-27 average 14.4 ha (Eurostat, 2012). In the northern parts of Serbia, in Vojvodina Province, the farm structure is more favorable with the average size of farm being 10.9 ha.

Table 5 *Farm structure by agricultural size of holdings (UAA) in Serbia*

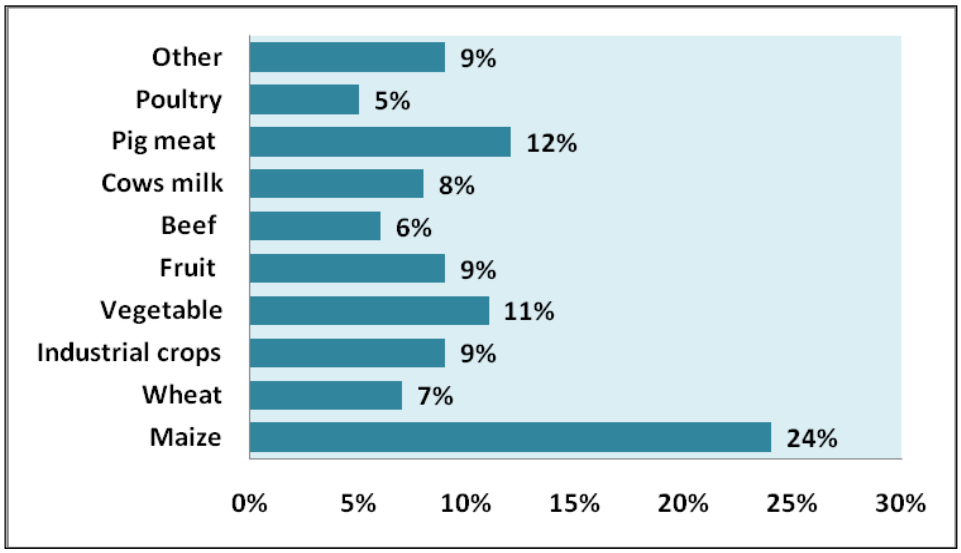
AREA	AGRICULTURAL HOLDINGS		UAA	
	Number	Structure (%)	(ha)	Structure (%)
> 0 ha	10,107	1.60	0	0
0 <2 ha	298,286	47.23	273,622	7.96
2 <5 ha	182,489	28.90	596,052	17.34
5- <10 ha	89,083	14.10	617,281	17.96
10- <20 ha	32,313	5.12	435,499	12.67
20- <30 ha	7,677	1.22	185,846	5.41
30- <50 ha	5,352	0.84	203,666	5.92
50- <100 ha	4,394	0.70	314,096	9.14
100 ha and more	1,851	0.29	811,362	23.60
Total	631,552	100.00	3,437,423	100.00

Source: Statistical Office of Republic of Serbia (SORS), 2013 and Eurostat, 2012

The highest proportion of agricultural holdings (47.23%) has up to 2 ha and uses about 8% of the UAA (Table 5). Farms with over 50 ha take only 1% of the total number of farms, but occupy around one third of the total UAA. According to the Census data in Serbia there are 1,443 million persons working on agricultural holdings. The number of AWU per farm in Serbia is 1.02 which is by 25% above the EU-27 average (0.81).

Structure of agricultural production- In Serbia, about two-thirds of the gross agricultural output (GAO) coming from crop production, while one-third of livestock production. The dominant position in the structure of the GAO has cereals, especially maize and wheat, about 31% (Figure 2). The productions of fruits and vegetables accounted for 20%, and industrial crops with 9% of the GAO. From the livestock products, pig meat participates about 12%, and cow milk with 8% of the GAO.

Figure 2 *Share of certain agricultural products in Gross Agricultural Output of Serbia, 2010 – 2012*



Source: Statistical Office of Republic of Serbia (SORS), 2013

According to the data of Statistical Office of Serbia, 50% of the total agri-food export goes to the EU market, around 41% to CEFTA countries and 9% to other. Russian Federation has become an increasingly important market for Serbian agricultural products, and also with the newly established Customs Union of Russian Federation, Belarus and Kazakhstan. The imported food commodities came mostly from the EU, about 48%, from counties of CEFTA about 22% and all the other countries account for less than a third of total imports (31%).

4. FAVOURABLE ENVIRONMENT AND AGRICULTURAL POLICY RELATED TO THE ORGANIC PRODUCTION

4.1. A brief description of the legal framework

The agricultural production and its development policy in the Republic of Serbia are regulated by a series of legal measures and activities, whose main goal is to: provide high quality and healthy food; strengthen the competitiveness of agricultural products; support the standard of living of farmers, rural development; protect the environment from the negative impacts of agricultural production etc. Certain laws define measures and activities, and the most important ones are described below, which also partially regulate the organic production.

Law on Agriculture and Rural Development ("Official Gazette of the Republic of Serbia" no. 41/09) regulates the goals and means for achieving agricultural policy, the types and conditions of exercising the right of incentives, users of incentives, group of cash incentives and benefits to farmers, agricultural recording and reporting, the register of farms, integrated agricultural information system and a number of other solutions related to the policy in the field of agriculture and rural development, as well as regulation of agricultural markets. Measures that are prescribed by law, promote the economic efficiency of agricultural production in order to ensure a stable income and the desired living standards in rural areas. Those measures suggest several following types of aid: to areas with harsh working conditions in agriculture, the so called "marginal areas"; improvement program for environmental protection, biodiversity conservation, investments in farms and program for diversification of the rural economy and improvement of the quality of life in rural areas.

Law on Regional Development ("Official Gazette of the Republic of Serbia", no. 51/09 and 30/10) stipulates: the names of regions and methods for determining areas and local authorities which are included in the region, classification of regions and local authorities according to their level of development, development documents, policies, measures, incentives and financing and implementation, as well as users of financial resources for the implementation of development projects, evaluation of measures and regional development policies. In order to promote regional development, this law establishes the five following regions: *the region of Vojvodina, Belgrade region, the region of Sumadija and Western Serbia, the region of Eastern and Southern Serbia and the region of Kosovo and Metohija*. According to the degree of development, the law defines two different types of regions: *developed regions*, whose level of development is above the national average gross domestic product per capita; and *under-developed regions*, whose level of development is below the national average gross domestic product per capita.

Based on the Law on Conducting Advisory and Professional Activities in the Field of Agriculture ("Official Gazette of the Republic of Serbia", no. 30/10), the legal prerequisites were created for the effective transfer of knowledge and technologies in the field of agriculture and increase in the competitiveness of agriculture as the main economic sector in rural areas.

Law on Organic Production ("Official Gazette of the Republic of Serbia" no. 30/10) regulates the production of agricultural and other products and production through implementation of organic production methods, goals and principles of organic production, production methods, control and certification, processing, labeling, storage, transport, traffic import and export of organic products, penalties, and other issues and entities that perform tasks related to organic production.

Food Safety Law ("Official Gazette of the Republic of Serbia", no. 41/09) has a main goal to provide a high level of protection of human life and health and consumer interests, including the principle of good faith in the food trade, taking into account when possible protection of the health of people, plants, animal welfare, and the protection and preservation of the environment. This Law regulates the level of food safety "from farm to table" in a way that it regulates obligations of all participants in the chain of production and classification of food and animal feed. Food safety is determined by the conditions at each stage of production, processing and transport, as well as the preparation and ways the consumers use it and it is also based on the information available to consumers, including information on the label. Food Safety Law stipulates that a risk analysis is performed as a regular activity in the system of food safety, based on scientific evidence and the opinion of the Expert Council for risk assessment in food safety.

Enactment of the Animal Welfare Act ("Official Gazette of the Republic of Serbia", no. 41/09) meant that the Republic of Serbia ruled out former conception of animals as economic resources. The law clearly separates clauses related to animals used for production purposes, scientific and research purposes, as well as working animals, pets, animals used in public gatherings (e.g. exhibitions) as well as abandoned and lost pets. This law defines the moral obligation of people to take care of animals (as beings who have feelings and can suffer stress, pain and suffering), particularly those species that influence human existence. In this sense, the welfare of animals includes caring for them and breeding them in such conditions that the animals live and carry out environmental activities so that it does not cause psychological (fear, stress) and physical suffering (pain and injury) for them.

The Plant Health Act ("Official Gazette of the Republic of Serbia", no. 41/09) regulates the internal transport, storage and import of plants and plant products (phytosanitary controls), the conditions for the provision of services in the field of plant protection, in accordance with the internationally accepted standards and recommendations of the IPPC (International Plant Protection Convention). Law on Plant Health Protection stipulates the obligation of registration in a special register of the Ministry of Agriculture and Environment of the Republic of Serbia of entities that operate with plant and soil nutrition agents, which is also required by other laws in the field of agriculture. This law abolished the jurisdiction of local government in the protection of plants, and provides the possibility of growing organisms that are the enemies of harmful organisms defined on lists of harmful organisms and objects, which enables the protection of plants to be carried out in an environmentally friendly manner.

The ***Law on Public Storages of Agricultural Products ("Official Gazette of the Republic of Serbia", no. 41/09)*** regulates the following for agricultural products: the activity, the conditions for determining the accountability of specialized public storages for grains, fruit and vegetables, industrial crops, and the conditions of storage. A public storage for agricultural products has to be registered for this activity, with the compliance requirements, with the register of public storages managed by the Ministry of Agriculture and Environment of the Republic of Serbia which issues a work permit. Work permit is issued for a limited period of time and may include some or all types of agricultural products.

4.2. Organic production in Serbian agriculture

With regard to natural resources, favorable soil and climatic conditions, biodiversity and relatively healthy agricultural ecosystems in Serbia are favorable conditions for the development of organic production. According to the MPŠVS in 2012 under organic production was 6,335 ha, respectively 0.11% of agricultural land. Of this, 5,360 hectares are arable land, and 975 occupy meadows and pastures. Number of producers that engage in organic production in 2012 increased to 1,061. According to the same source data, organic vegetable production is most represented in Vojvodina (72%), followed by the Southern and Eastern Serbia (16%), and region Sumadija and Western Serbia (11%). In crop production, dominantly place has the wheat, and in fruits that are grown using methods of organic production Also, a large amount of certified wild plant species (raspberries, strawberries, blackberries, apples, blueberries, mushrooms, etc.). Number of fruit plantations and vineyards dedicated to organic production is small, and the areas they occupy. In organic livestock production in 2012 was mostly is grown sheep, poultry and cattle.

In Serbia organic products are sold in a variety of ways: directly on the farm, in the green market, distributing in wholesale and retail stores and illustration. According to interviews with the producer and processors (September, 2014), organic agricultural products are mainly sold to wholesalers and processing companies, with which almost 70% of primary producers concluded in retail facilities contracts before the season starts. Among distributors are more important Beyond and Bio Spajz, a supermarket chain of importance are: Univerexport, Mercator, Tempo, Metro, Maxi Road supermarket, DM Drogerie market and others. Number of retail stores of organic food in Serbia is still small. Direct sales, for example, at green markets practiced only 20% of the farmers. Because of this system, increasing the prices that producers realize for their organic produce is approximately 10-20% and confirms the fact that the added value is not created at agricultural holdings. Also problematic is the representation of the product on the market. Given the often suffer from lack of storage space the products are available only during the peak season, when producers flood the market.

Some companies in Serbia imported raw materials of organic origin, processing and final products are sold mainly in Serbia, and partly exported (Annex 2). Most organic products that can be found on the Serbian market are imported and only a certain amount of fresh products such as: vegetables, grains, fewer fruits, and of processed: flour, time milk products: fresh milk, yogurt and sour cream. Classification of t pasta, juices and jams, oils, mattresses, are of domestic origin. For now, the market of certified animal products, a small amount can only find eggs and honey, since 2013 and for the first he product is done vegetable products were 2013 years compared to 2009, decreased by 13.5%, prices of fruit every other farmer, mainly by size, rarely towards quality. Products are packed in plastic containers. Aggravating circumstance when it comes to transport goods is the fact that 40% of packaged goods in packages with a mass less than 100 kg, while only 36% is in packages weighing more than 100 kg.

In the sector of organic production in Serbia are significant companies operating in terms of processing products from conventional fruit and vegetables. Number of registered processors of fruits and vegetables is very high, about 200, and they all have a legal obligation to comply with HACCP standards. About 25 companies engaged in the processing of products from conventional production have an additional line for processing organic products. Also, some individual producers perform processing their own products. The domestic market for organic products is not sufficiently developed. According data to the MPŠV (2013), from Serbia are now exported only organic products of plant origin, mainly partially processed. The export of frozen fruit is the most

common (72% of the total volume of organic products), and most are exported to Austria (35, 85%) and Germany (27.96%), followed by the Netherlands and Italy.

Prices of agricultural products from conventional and organic production in Serbia in the last five years significantly fluctuated. Prices of and wine-growing products for 14%, while prices of animal products by 3.2% (SORS, 2014). There are still no official records of the scope of production and prices in the sector of organic production. Based on information gathered through interviews, the price of organic products in the period 2009-2013, also as prices of conventional products from year to year fluctuated.

4.3. Certification and control

In Serbia, there are six inspection bodies which were authorized by the Ministry of Agriculture and Environment of the Republic of Serbia to exercise control and certification in the field of organic production (Table 6).

Table 6 *Inspection bodies for control and certification of organic production in Serbia, 2014*

NO.	INSPECTION BODIES	WEBSITE
1	Organic Control System	www.organica.rs
2	Etko Panonija	www.etkopanonija.org
3	Ecocert Balkan Beograd	www.ecocert.com
4	TMS CEE	www.tms.rs
5	Control Union Danube d.o. o.	www.control-union-danube.ls.rs
6	Suolo e salute Balkan	www.suolo-e-salute-balkan.ls.rs

Producers of organic products can apply for certification individually (alone) or as a group. In the first case, the producers directly enter into a contract with one of the certification bodies and pay for the costs of certification in accordance to a contract. In the second case, the producers sign a contract with a subcontractor (often a buyer of their products), while a subcontractor signs a contract for group certification with one of the certification bodies. In this case, the producers indirectly, through a sub-contractor, obtain a group certification for their production.

This is done in accordance with applicable legislation of the Republic of Serbia. Subcontractors (companies), that signed a contract with producers, are obliged to purchase from the producers the entire amount (volume) of products for export markets, and they provide the following for the producers: inputs, education (seminars, trainings, workshops, etc.) and cover the costs of certification. In addition, the certificate holder is a subcontractor's company (enterprise) and the subcontractor (company) covers the costs of certification.

Serbian legislation in the field of organic production is still not completely in accordance with the EU regulations. In accordance with the proposal of certification bodies and certain non-governmental associations, an initiative to amend the existing law on organic production has begun. Proposals were documented in writing by the National Association for the Development of Organic Farming - Serbia Organica, and were submitted to the public as a draft version. The proposal is expected to be adopted soon after detailed consideration by the competent authorities.

4.4. Research and advisory services

Education reform in accordance with the Bologna process, in accredited curricula and programs in Serbia, has resulted in introduction of new subjects (as mandatory or optional) in the curriculum of high schools and universities, for example, organic crop production, organic livestock production, organic fruit production, organic production economy, etc. Thus, during the implementation of the curriculum in 33 state-funded secondary agricultural schools, students acquire knowledge of basic biotechnology and business methods in organic production. In addition, accredited higher education institutions – faculties and institutes, provide educational specializations and research in the field of organic production. Important institutions are: the Belgrade University Faculty of Agriculture, the Faculty of Agriculture in Novi Sad, the Agronomic Faculty in Cacak, and the Faculty for Biofarming in Backa Topola, the Faculty of Ecological Agriculture in Svilajnac, the Belgrade University Faculty of Veterinary Medicine, and the Belgrade University Faculty of Forestry (Table 7).

Table 7 *Some Research and Development Institutions and extension services in Serbia, 2014*

NO.	INSTITUTION /EXTENSION SERVICES	WEBSITE
1	Faculty of Agriculture, University of Belgrade	www.agrif.bg.ac.rs
2	Faculty of Agriculture, University of Novi Sad	www.polj.ns.ac.rs
3	Faculty of Biofarming, Megatrend University	www.megatrend.edu.rs/fbio
4	Institute of Agricultural Economics, Belgrade	www.iep.bg.ac.rs
5	Institute for Meat Hygiene and Technology, Belgrade	www.inmesbgd.com
6	Institute for Vegetable Crops, S.derevska Palanka	www.institut-palanka.co.rs
7	Institute for Research of Medicinal Plants, "Josif Pancic"	www.iplb.rs
8	Institute of Field and Vegetable Crops, Novi Sad	www.nsseme.com
9	Institute Tamiš, Pancevo	www.institut-tamis.co.rs
10	Faculty of Ecological Agriculture, Svilajnac	www.educons.edu.rs
11	Agricultural Extension Service of Serbia	www.psss.rs
12	Agricultural Extension Service of Vojvodina	www.polj.savetodavstvo.vojvodina.gov.rs

Agricultural economics curricula are taught at Universities of Belgrade, Subotica, Novi Sad and Nis. It should be noted that the Faculty of Agriculture in Novi Sad, which has accredited curriculum in accordance with the Bologna process, introduced as a separate course, Organic agriculture, both undergraduate and master. For expert help and advice to producers in agricultural production in Serbia, there are 34 extension services, where 235 advisers of various profiles are currently employed. Organic production advisors do not provide only organic production related services, although organic production is partially covered in the system of providing advisory services. Services provided by the state extension services are free of charge, and the quality depends both on the amount provided from the budget, as well as the employee's expertise.

The Law regulates the field related to advisory and professional jobs in Serbian agriculture, and thus the key segments for organic production, such as: the Register of agricultural advisors; development planning for advisory positions; terms and methods of conducting advisory and professional jobs in agriculture; training and development of agricultural advisors and producers; etc.

4.5. Measures support of organic production

In addition to advisory services, producers of organic products are also eligible for financial support and incentives. According to the Law on Incentives in Agriculture and Rural Development ("RS Official Gazette", No. 10/13), the Regulations on the Use of Incentives for Organic Production were published in the "Official Gazette of RS", No. 52/14 dated May 15, 2014. It appoints the types of incentives, conditions and ways for submitting an application for becoming eligible for incentives in organic production, as well as the maximum amounts per user and per type of individual measures.

A legal entity, an entrepreneur and an individual – a holder of a commercial family farm, are entitled to different types of incentives for organic production. In addition to becoming eligible for incentives, the user must meet the following requirements:

- that a contract has been concluded with a control body, regarding control and certification in organic production, which is valid for the year in which the application is submitted for the use of incentives;
- that in the case of a lease of agricultural land on which the organic production is performed or in the case of land acquired in binding, a contract has been concluded at least three years from the date of filing the requests for eligibility for incentives for organic crop production:
- That in the next three years from the year in which he exercised his right to incentives for organic crop production; he applies methods for organic vegetable production in accordance with the law governing organic production in the cadastral parcels for which he qualified for incentives for organic crop production.

Different types of incentives for organic production are handled by separate regulations governing the rights of the premium for the milk, the main incentives in crop production, the subsidy for fuel, fertilizer and incentives in livestock for fattening beef cattle, pigs and lambs and quality breeding animals (dairy cows, sheep and goats, sows, parent chickens - heavy and light breed, parent turkeys, carp breeding parent fish and trout breeding parent fish). That is how the incentives for high-quality cattle have been determined for livestock production in 2014: for breeding dairy cows in the amount of RSD 28,000 per head; breeding sheep and goats in the amount of RSD 5.600 per head and breeding sows in the amount of RSD 5.600 per head; parent chickens - heavy breed in the amount of RSD 84 per head; parent chickens - light breed in the amount of RSD 140 per head; parent turkey in the amount of RSD 420 per head; carp breeding parent fish in the amount of RSD 700 per head; trout breeding parent fish in the amount of RSD 420 per head; fattening beef cattle in the amount of RSD 14,000 per head; fattening lambs in the amount of RSD 1,400 per head; and fattening pigs in the amount of RSD 1,400 per head. The premium for milk produced in organic production is RSD 9.8 per liter. For all types of incentives, users of incentives can obtain a maximum of RSD 55 million. It is important that agricultural producers organic product by the Ministry of Agriculture and Environment of Serbia, allows the recovery (refund) 50% of funds for costs incurred certification.

Incentives for organic crop production include the following measures and amounts: a fuel allowance in the amount of RSD 70 per liter of fuel, a maximum in the amount of RSD 4,200 per hectare; basic incentives in organic crop production in the amount of RSD 8,400 per hectare; allowance for authorized funds for fertilizers and soil refinement tools in organic crop production in the amount of RSD 14 per liter, i.e. kilogram, a maximum in the amount of RSD 4,200 per hectare, for selected breeders, such as: Eurobia 26, SI FOS, Patenkali, Sop Fort 0:0:50, Humus Vita Stallatico Super, etc.

5. ANALYSIS OF MAIN COMPONENTS AND PERFOMANCE OF SELECTED ORGANIC FOOD PRODUCTS VALUE CHAINS BY INDENTIFICATION REGIONS

5.1. The value chain of organic vegetables specific to the region of Vojvodina

The vegetable production in Vojvodina is characterized by the tradition, favourable environmental conditions and the possibility of market. It has the characteristics of developed production, including all forms of production (from garden and field production to production in greenhouses). The combination of open-field and greenhouse production enables organization of year-round production with assurance of high nutritional quality as well as technological quality and food safety. The main characteristic of the development of organic vegetable production is the generation of the economical yield, of high nutritional quality and health of vegetables, which will be achieved by implementation of appropriate cropping (agro-technical) practices, cultivation of appropriate varieties of high-quality and with the use of quality seeds and planting materials.

According to the Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia, the production of organic vegetables in Serbia is performed on 123 ha, with 115 ha in the phase of conversion. In the structure of organic plant production, the vegetable production contributes only 3%. The vegetables are mostly cultivated on farms of size in the range from 5-10 ha. The main elements of organic vegetable production (agricultural technical practices) are:

- the use of crop rotation according to the requirements of cultivated vegetables;
- soil tillage (time, manner, depth, type of machinery);
- fertilization (types of fertilizers - manure, biological fertilizers - time of incorporation of fertilizers, quantities);
- varieties (cultivars or hybrids of domestic or foreign origin);
- seedling production - strictly controlled according to the organic production method (place of production of seedlings, i.e. open field, hotbeds or greenhouses, time of sowing, seedling care - watering, fertilization, pest protection and pathogens prevention);
- sowing, it refers to those types of vegetables which are produced directly from the seeds (sowing time, manual or machine sowing, depth, spacing between rows and between plants in a row, the amount of seeds,);
- transplantation (time, manual or machine transplantation, the distance between rows and between plants in a row);
- crop care (irrigation, inter-row cultivation, hoeing, covering of soil with plastic foil or some other material, such as straw, fresh manure, hay, dry leaves or sawdust)
- protection from weeds, pathogens and pests (time of application and quantity of biological products, types of weeds, pests and diseases);
- harvest (time, stage at which the vegetables are harvested, method of harvest, i.e. manual or mechanical harvesting, types of packaging in which the vegetables are packed for the market - crates, cardboard boxes, plastic bags, woven plastic bags and other packaging, yield per unit of area/surface).

The presence of vegetable production on representative farms, data based on the results of interviews with the owners in the Vojvodina region:

- *Šokšić Gordana* from Zrenjanin – on an area of 6 hectares, the following vegetables are cultivated: potatoes, cabbage, carrots, onions, cauliflower, squash, beets and others. Organic vegetables are the main source of income on the farm.
- *Mamužić Josip* from Subotica - on 22 ha, grains, vegetables, legumes are cultivated, and on a smaller area cherries. Vegetables grown are carrots, beets, onions, sweet peppers, etc. In addition to the primary production, he has also certified processing of vegetables.
- *Stojanović Svetlana* from Kikinda – on an area of 6.7 ha, tomatoes, peppers, carrots, onions, broccoli, cauliflower, kohlrabi, red cabbage, kale, white cabbage, green beans, peas, many types of peppers and tomatoes, cucumber, etc., are cultivated.
- *Kolouvija Predrag* from StaraPazova – on an area of 5.8 ha, lettuce, tomato, zucchini, potatoes, strawberries are cultivated. He has certified the processing of vegetables, and produces following processed products: "ajvar", tomato juice, etc.
- *Gašparovski Jožef* from Selenča, buys vegetables and fruits and processes them. He has registered the processing of products in conventional production and processing of certified organic products. The products from organic production make about 20% of the total processing capacity.
- *Vlado Vozar* from Kisač – on an area of 15 ha, cabbage, beets, broccoli, and zucchini, onions, chard, spinach, and other crops, important for the crop rotation, are cultivated. In addition to the primary production, he is also engaged in the processing and performs additional processing of some organic products (e.g. produces cooked beets, sauerkraut, etc.).
- *Rudolf Buler,* the owner of the food industry "Ekoland" from Germany, in Sombor on 70 ha of land cultivates following vegetables: peppers, soybean, mustard, and some field crops: corn, tobacco, alfalfa, and has fruit crops. In addition to production, he buys different organic products from over 20 producers, dries, grinds and packages spice paprika.

The value chain of organic vegetables in Vojvodina, as well as in Serbia, consists of several key chain links, and they are: input suppliers, producers, direct buyers, cold storage and processing facilities, industrial facilities, wholesale and retail facilities in the market, export and trading companies and others.

There is certain connection between producers, processors and other stakeholders in organic vegetable production in the region. They are connected through the Centre for Organic Production in Selenča, the National Association for Organic Production "Serbia Organica", Green Network of Vojvodina, the Association "Teras" in Subotica, etc. Through these societies, associations and other organizations, members are able, to a certain extent, in a horizontal and vertical cooperation, to improve their production and to fight for better competitiveness in the market. However, due to insufficient funding and poor organization, this form of association is not efficient enough. Producers association represent the interests of all growers that are being achieved through general advice, pricing policy, promotion, etc. The main motives for forming of associations are legal support and security; information on inputs; rational development of production processes; easier handling and storage of finished organic products; faster and more efficient marketing of products; financial support (loans, grants, etc.) better infrastructure; better utilization of capacity; education on improving the quality (standards, etc.) higher labour productivity; lower losses and higher production efficiency; better and higher profitability, etc.

In addition to the above mentioned reasons for forming of associations, in order to save and better utilize capacities, it is important to point out that for many institutions it is easier to work with

organized and affiliated producers. Thus, for example, funds in the joint investment in modern facilities, such as cold store facilities, will be more accessible to the association, than to the single producer. In fact, if "small" vegetable producers want to seriously engage in competition with large to producers, success can be achieved only by forming associations. One of the ways for the producers of organic products from Serbia to be able to compete in the global market of organic food is the support by the relevant institutions and ensuring the horizontal and vertical integration of marketing channels. The horizontal integration allows economies of scale and vertical integration provides a more efficient marketing system (multiple distribution channels, packaging, transportation, direct sales and production inputs). Due to the variable quality of organic vegetables, it is difficult to distribute it fresh.

5.1.1. ORGANIC VEGETABLES SPECIFIC TO THE REGION

Tomato and spicy paprika produced in the open field are selected as a representative of products in the organic vegetable production in the region of Vojvodina.

Tomato production. According to its economic importance, distribution and use, tomato is one of the most important vegetable crops in the world, and especially in the region of Vojvodina, where the soil and climatic conditions are favourable for its cultivation. In the diet, in addition to use in the fresh state, it is used in processed condition, in the industrial and domestic way - in juices, purees, concentrated extract, peeled tomatoes and dried products.

Tomato is a plant that needs a lot of heat during its development. It requires a relatively long period of summer time for a successful and profitable cultivation. The best results are achieved through the cultivation using seedlings. For the industrial processing requirements, tomatoes can be successfully grown by direct sowing. It grows on almost all soils, ranging from sandy to heavy smonitsa. However, the most favourable are light, permeable, structural and drainable soils, rich in humus materials. Such soils are best suited for early crops of tomatoes. For subsequent culture, heavier, clay soils can be considered good, since they are capable of keeping the moisture during the summer months. The fertilization is done using the available fertilizers approved by the Ministry of Agriculture, for organic production. If available, manure is used in the amount of 30-40 t/ha. The cheapest variant is a combination of manure and other organic fertilizers. Otherwise, tomato requires abundant and carefully balanced mineral nutrition. In practice, the production of tomato is increasingly being divided into production for fresh consumption and the production for industrial processing.

Selected and high quality organic seeds are used in sowing of tomatoes. The seedlings of tomato are produced in practice in warm, lukewarm or cold seedbeds, depending on the time of sowing. Land/soil for tomatoes should be deeply tilled, chopped and well prepared. The planting spacing depends on the cultivar, production use, and available equipment. Lately, the tomatoes are grown increasingly in the system with trellis. By its nature, the tomato is a bushy plant, and in practice, with the intervention, the desirable trees can be formed. In order to obtain high yield and quality, irrigation is performed, as a necessary agricultural and hydro-technical measure. The irrigation method and standard are determined based on the plants' requirements, often with addition of top dressing organic fertilizers

Harvest and yields. For the local market and sure customers, organic tomatoes are harvested when the fruits have reached full maturity and characteristic colour. For slightly distant markets, harvest is done earlier, when the fruits are almost ripe. Harvesting/Picking is done in dry weather. For production of juice and other processed products, on the farm or by a company that buys products used for further processing, harvesting is done at the stage of full maturity of the fruit. The specific condition for tomato processing is the simultaneous ripening of fruits.

It is necessary that at the time of the harvest over 80% of fruits are ripe. This is achieved by growing appropriate varieties and application of agro-technical measures that enable simultaneous growth and development of all plants in the crop. The seasonal labour is hired for harvesting, if necessary. The fruits are packed in good packaging and kept in cold stores for further transport. The yields range from 40-80 t/ha depending on the properties of soil, varieties, production line and applied agro-technical practices.

Storage.Tomato is stored only in exceptional cases, if it cannot be sold immediately. Under optimal conditions, at a constant temperature of 13 0C and at 75-80% relative humidity of air, it can be stored up to two weeks, and not loose colour and shine. Tomatoes can be stored longer at a temperature of 10 0C, but then the fruit becomes sour and floury, aromatic substances are lost, and uneven coloration can be created, recessed spots, or strange taste, especially if storage is not well ventilated.

Spicy paprika is one of the most important spice plants. In the production of spice paprika, physiologically ripe and air dried fruits are used, which result in red ground powder subsequent to milling, and are known under the trade name "aleva paprika" (chilli pepper powder). It is a red colour spice, of good colouring power, pleasant aroma and flavour that improves the taste and smell of food. In addition to sweat paprika, also hot spice paprika is cultivated. The spice ground paprika for our country is also an important export item because a large part of our production is exported to foreign markets.

Spice paprika produced in the area of the Pannonian Plain was world famous and sought, even today, after a short period of crisis due to the presence of artificially coloured and edible paprika from some west European countries. The production of spice paprika in Serbia is mostly concentrated in Vojvodina, where about 80-90% of total production is located. In Serbia it is grown on about 3,500 ha per year. Due to the exceptional quality that can be achieved by growing the spice paprika in our country, and also because of the great disruptions in the world market especially due to use of inorganic and health-endangering colours, there is a great perspective for the production of spice paprika in our country on much larger areas than the previous.

In our country there are only few varieties/cultivars of spice paprika, unlike vegetable peppers used in consumption, for which there are many varieties/cultivars and populations. The following varieties/cultivars are most common in our production practice: sweet Horgoška-2 (HS-2). The average plant height is 55-60 cm with intense cup-like branching. The leaves are grey-green. The fruits are smooth, 9-12 cm in length and weight of a single fruit in the average is about 20 grams. The colour is dark green, and during ripening it becomes intensely red.

The variety Pešcani grom is the most cultivated hot paprika variety of Horgoš paprika varieties. When exported, it is packed in cardboard paraffined boxes measuring 30 x 50 cm, or in wooden crates 60 x 40 cm, height 20 cm, suitable for packing onto the euro pallet. In addition to the conventional production, spice paprika, increasingly takes place in organic vegetable production. This is confirmed by the information given by the interviewed producers in the region of Vojvodina.

5.1.2. PROVIDING INPUTS

According to the interviewed producers of organic vegetables in the region of Vojvodina, the seeds, biological fertilizers and other inputs are purchased, either directly from the producer, distributor or through agricultural pharmacies. In direct contact with the producers, information on the application and method of use of fertilizers and plant protection in this production can be obtained.

5.1.3. PRODUCTION LEVEL

Quantity (volume) of the organic vegetables is modest, with limited (small) facilities for its storage. Particularly lacking are special sowing machines and quality planters, sprayers, high-quality irrigation systems, machinery for harvesting, grading and packaging. The assortment is adequate to the level of production. The agro-technical practices are conducted in a controlled manner and by a qualified person, during the production year. Information related to specific problems in production, also are obtained from experts. Family members are the main labour force on farms. Lacking labour is hired, but it is getting more expensive and deficient.

According to the records of data SORS (2014) in the period 2009-2013, producer prices of tomatoes from conventional production varied in the range 0.20 to 0.40 EUR/kg, while the STIPS-in, the sales price of the green market in the same period fluctuated in interval from 0.20 to 0.55 EUR/kg. Producer prices spicy paprika from conventional production ranged between 0.20 and 0.48 EUR/kg, while the selling price in the green market from 0.35 to 0.70 EUR/kg. In addition to the oscillations, with tomatoes and spicy paprika is a noticeable downward trend in prices and 2013 years compared to 2009, prices were lower by 20-30%. However, in comparison to conventional production, producer prices of organic tomatoes and spicy paprika were 15-20% more, and the selling price to the green market, even 50-80% more than tomatoes and spicy paprika from the conventional production.

5.1.4. PROCESSING

Vegetable processing is generally performed in a number of small companies of modest capacity. Some producers perform finishing and processing on their own farms with the involvement of family members. They use traditional methods "grandma recipes" and produce in a quite extensive method, lower quantities of healthy products. For example, they produce juice from organic tomatoes, sauerkraut, pickles, and sell them as final products.

5.1.5. DISTRIBUTION

Distribution and sale of organic products on the territory of Vojvodina is characterized by a medium level of organization. Retail goes through the city's green marketplaces or in markets dedicated to organic products or buying directly from farmers at production sites. Wholesale trade is carried on larger markets and remote areas outside the region, the Belgrade market or sporadic "export" according to the specific orders by customers to the markets of the EU and the United States. The selling price is influenced by number of factors: cost, distance to markets, supply and demand, financial solvency of customers, etc.

There are several ways to present the vegetable products to a potential buyer, and generally to the market, as: direct sales (on the farm or in markets), through the internet, small advertisements in newspapers, radio and TV, a letter that is sent directly to potential customers, by phone, handing out of free pamphlets, direct negotiations, etc. When negotiating with the representatives of hypermarkets, producers and processors often prepare promotional material - production program with important information - specific products, production volume, capacity, storage, packaging, certificates, etc.

During the second half of 2007, the first store that has been registered and authorized to sell organic products "Moj salas" started to work in Novi Sad. The store holds all agricultural products produced by producers with certified production facilities at the local level. Before it started to sell the products from this store, the sale of products was organized on the green market, which is still operating. The green market "Moj salas" is held in public spaces, parks, playgrounds, parking lots and other available public space. The marketplace is occasional; it has a character of a

festival and is held twice a month or more often, depending on the producer supply and demands of consumers.

Tim Green Network of Vojvodina regularly visits the producers to make sure that the products sold on the market stalls are their own products and are manufactured in accordance with the principles of sustainable agriculture. All the products in the market were registered in the Green Network of Vojvodina. It brings together and helps farmers and agricultural producers who are engaged in organic and traditional agricultural production or respect the principles of good agricultural practice. In this way it promotes restoration of traditional farm production and life on the farms; it combines the supply of healthy-safe products and supply of products from organic production; it provides citizens with healthy-safe food, informs and encourages the further development of sustainable agriculture. Farmers and agricultural producers, direct producers, with the help of the market "Moj salas" create an economic base for the independence and development of production while ensuring the protection of the environment and still providing the city's residents with fresh, high quality fruits and vegetables, flowers, handicrafts and other products related to farms.

Also, in Belgrade at the beginning of July 2011, by the National Association for the development of organic production "Serbia Organica" and PC "City Markets", with the support of the Ministry of Agriculture, Trade, Forestry and Water Management, as a result of the project on the promotion and sale of organic products, "The Green Market of Organic Food" was opened in New Belgrade. Customers can obtain organic products “first hand”. On this market exclusively certified organic products are sold, as well as those that are in the period of conversion, as proven by sellers with the appropriate documentation. Here you can buy: seasonal organic vegetables and fruits, cereals, flour, legumes (peas), medicinal and spice dried herbs, tea blends, honey etc.

5.1.6. COST-BENEFIT ANALYSIS

Comparative analysis of gross margins of organic and conventional tomato production

As is well known, inputs and technology in organic and conventional production are different. Therefore, in further analyzes date calculations per unit area for the same product in different in different ways of production. In addition to the production of certain organic products was performed and calculation processing. In this way, one can see the economic efficiency of the added value of organic products. Based on the average amount of inputs and outputs in the organic farming of tomatoes and spice paprika in Vojvodina, the value is determined by the individual elements of the calculation and on that basis the main indicators were calculated: gross income, total variable costs, gross margin per hectare, per own labour hour and per cash cost. The tables 8 and 9 display the values of the basic elements of calculation in organic and conventional production of tomatoes per 1 ha in the open field.

Table 8 *Gross margin of* ***organic tomato*** *production per 1 ha area in Serbia*[1] *(in open field)*

	ECONOMIC INDICATOR	UNIT	QUANTITY	PRICE (EUR/UNIT)	*TOTAL VALUE* (EUR)
I	Gross income				
	- *Yield*	t	35.00	400.00	14,000.00
	Total (I):				14,000.00
II	Variable costs				
	Seeds /nursery	kg	1.70	945.00	1,606.00
	Fertilizers (organic, biological, etc.)				1,679.00
	Biological plant protection				1,314.00
	Certification and Control (50% of this cost)[1]				146.00
	Other inputs				511.00
	Machinery-own				949.00
	Labour		105.00	10.43	1,095.00
	Hired	day	35.00	10.43	365.00
	Own	day	70.00	10.43	730.00
	Total (II):				
	Actual				7,300.00
	Actual minus imputed				6,570.00
III	Gross margin				
	Per Hectare				6,700.00
	Per T*one of Yield*				191.43
	Per Own Labour Day				106.14
	Per Cash Cost				1.02

In this analysis, the yield is not divided into classes, the average price at which the medium quality products were sold was considered as the market price (selling price). This means that, in this way, producers with a higher sale price can achieve far better economic results than those obtained in the calculations. Both productions are economically justified and achieved positive gross income, in the production of organic and conventional tomatoes in the amount of organic 6,700.00 EUR/ha, and in the production of conventional, it amounted to 4,300 EUR/ha. If compare the economic indicators of tomatoes in organic and conventional conditions (Table 8 and Table 9), we can see that the gross margin per hectare is higher in organic tomatoes for 2,400 EUR. Also, the gross margin per labor own day is economically favorable (106.14 EUR/Day > 90.00 EUR/Day) and gross margin per cash cost is higher in organic tomatoes (1.02 EUR/ha> EUR 0.85 EUR/ha). The breakeven yield of organic tomato is 18.25 t/ha, and of conventional is 25.45 t/ha.

[1] In this study, in preparing the calculations products of gross margin not shown is the producer's support for organic production as part of gross income, but are calculated for 50% less the cost of certification. The houses for certification in Serbia do not have the same tariffs for the cost of certification. Thus, producers of organic products by the Ministry of Agriculture and Environment of the Republic of Serbia, on the basis of the submitted bills paid for certification, granted compensation (refund) 50% of the cost of certification, as a measure of support.

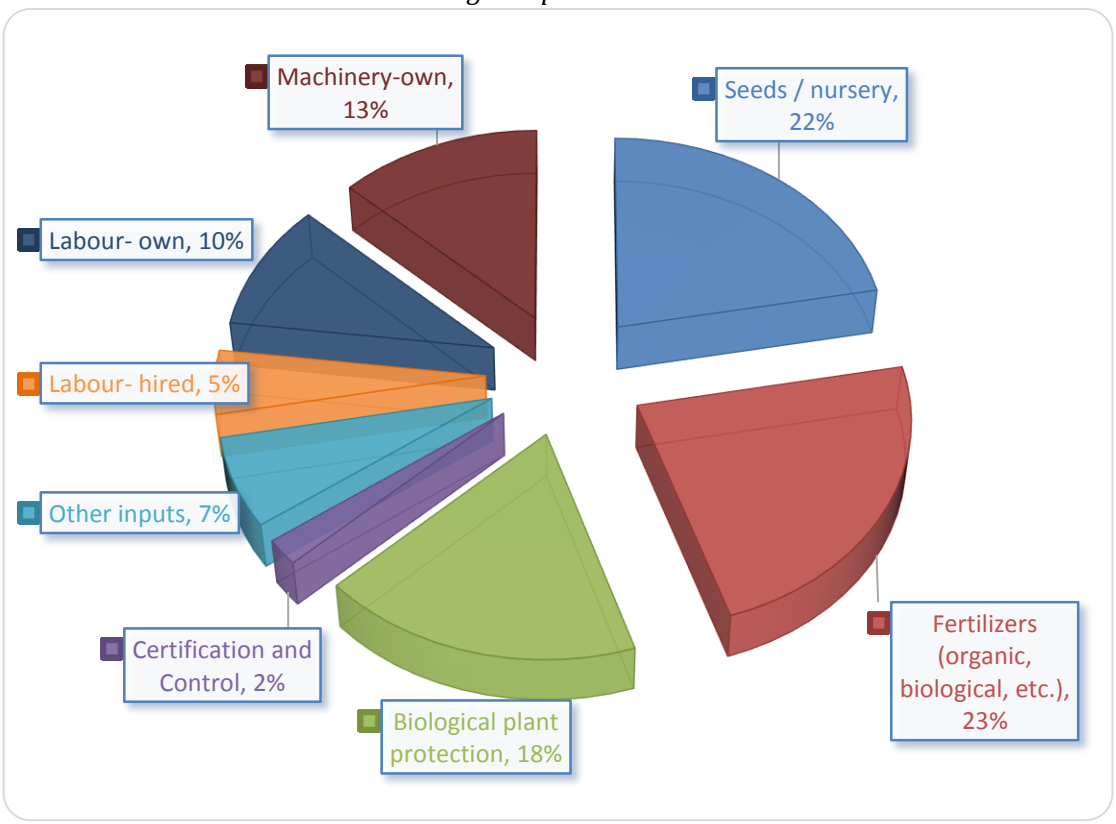
Table 9 *Gross margin of **tomato** production **in conventional** production per 1 ha area (in open field)*

	ECONOMIC INDICATOR	UNIT	QUANTITY	PRICE (EUR/UNIT)	*TOTAL VALUE* (EUR)
I	Gross income				
	- *Yield*	t	45.00	220.00	9,900.00
	Total (I):				9,900.00
II	Variable costs				
	Seeds /nursery	kg	1.70	593.00	1,008.00
	Fertilizers (total)				1,288.00
	Pesticides (total)				1.064,00
	Other inputs				445.00
	Machinery-own				1,232.00
	Labour-Own	day	54	10.43	563.00
	Total (II):				
	Actual				5,600.00
	Actual minus imputed				5,040.00
III	Gross margin				
	Per Hectare				4,300.00
	Per *Ton of Yield*				95.56
	Per Own Labour Day				90.00
	Per Cash Cost				0.85

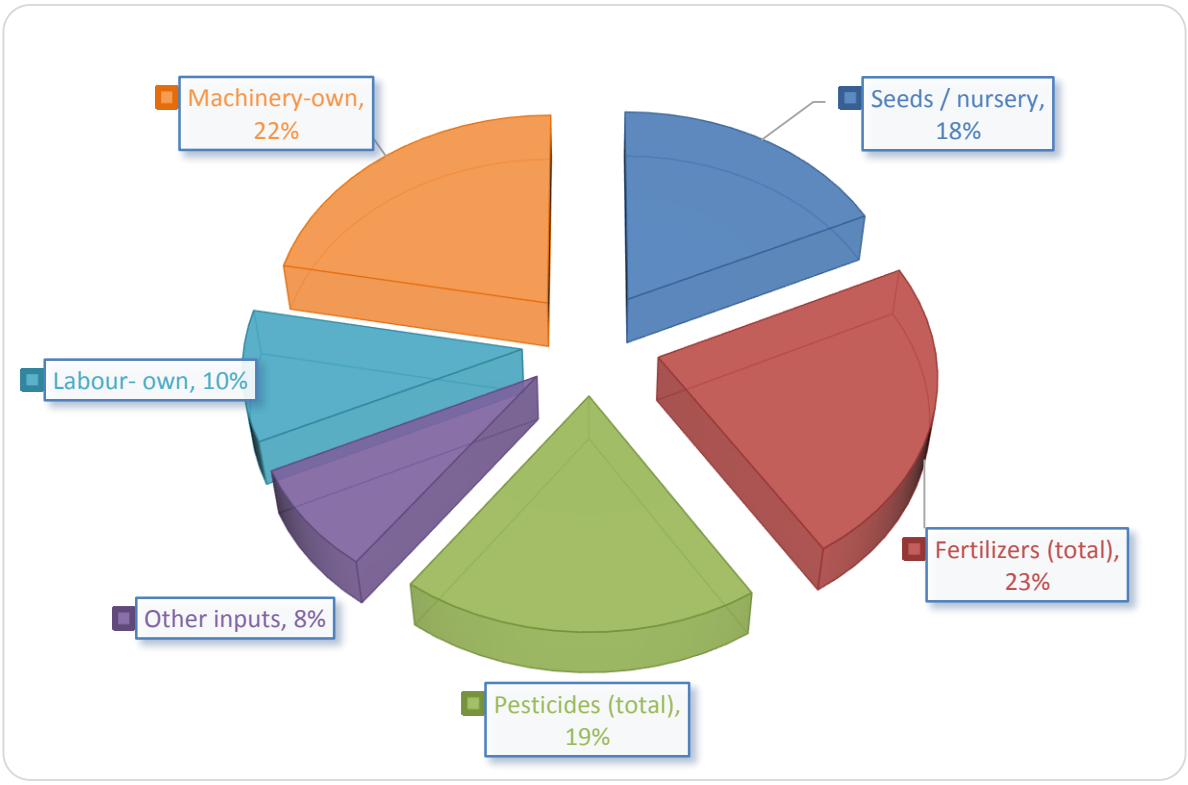
Due to different technologies and inputs in terms of organic and conventional production, the figures one can see different structures and share certain expenses (Figure 3). Thus, in the cultivation of organic tomatoes take a major share of organic, biological, and similar fertilizers (23%), seed is expensive and the cost of inputs occupy about 22%, followed by biological agents for protection (18%), the cost of certification and the greater involvement of human labor. Costs of certification of production account for 2% of the production costs of the analysed products. This applies to products that are certified by an authorized company in Serbia. For export, additional amounts are paid for EU or USA certificates, etc., but on the other hand, through export favourable sales price are achieved and therefore better profit. On the other side, in conditions between conventional growing of tomatoes, the main share of the costs have mineral fertilizers (23%), followed by pesticides and other chemicals for protection (19%), cost of seed (about 18%) and a larger share of machine work, and less involvement of human labor.

Figure 3 *The structure of the cost of production of tomatoes in different ways*

- organic production -



- conventional production-



Source: Based on data from the calculations in the tables 8 and 9

In addition to the percentage share of certain costs in the structure of variable costs, it is important to observe in these calculations and in natural amounts for certain cultural practices. Observed per unit area, the cost of seeds, fertilizers, protection, etc. in organic production generally are higher than in conventional. Also, in organic production engages more labor and less mechanical. Although the inputs are more expensive and higher costs per unit area in organic vegetable production, we get products that have a higher biological value. Due to the better quality is achieved by significantly more favorable market price of organic products compared to products from conventional production.

Gross margins of production and processing of organic spicy paprika

It should be pointed out that most of the producers of organic vegetables, sell their products from primary production as final. Although in this way better profitability is achieved, compared to the conventional production, further processing and refining, would significantly improve the success of the business. So, if tomatoes produced are used for processing into juice or with a combination of pepper, for production of "pinđur", "ajvar" (chutney) and other products, for example., the ratio of price of one kilogram of "pinđur" and values of all inputs for its production (tomatoes, peppers, onions, etc.) is 5:1. This means that the producer, with additional investment in packaging, labour, etc., could reach almost four times more profit in processing vegetables, compared to realization in primary production.

A good and representative example of an economic analysis of production and processing of organic products in the region of Vojvodina is spicy paprika. Fresh spice paprika after harvest puts on ripening (wilt). After ripening, off the stalk, wiped the moisture from the peppers and put on drying. Drying takes from eight to ten days. After drying, perform the screening and crushing the paprika into small pieces. So broken paprika deposited in paper bags and stored in a warm room, a maximum of two days. The last operation in the manufacturing technology is the spice pepper grinder. The grinding mill is conducted to a screen with openings of 1.5 mm. Freshly ground paprika is placed in a plastic or enamel, leaving a couple of days in a dark room and occasionally stirred to obtain their characteristic red color. After that, follow the package of ground spice paprika in a different packaging. On the basis of inputs and outputs and production and technology that take place in the practice of growing organic paprika in the table 10 is calculated gross margin per hectare and per ton of yield.

Table 10 *Gross margin of* ***organic spicy paprika*** *in 1 ha area (in open field)*

	ECONOMIC INDICATOR	**UNIT**	**QUANTITY**	**PRICE (EUR/UNIT)**	***TOTAL VALUE* (EUR)**
I	Gross income				
	- *Yield*	t	25.00	480.00	12,000.00
	Total (I):				12,000.00
II	Variable costs				
	Seeds /nursery	kg	1.10	655.00	720.00
	Fertilizers (organic, biological, etc.)				864.00
	Biological plant protection				645.00
	Certification and Control (50%)[1)]				72.00
	Other inputs				252.00
	Machinery-own				432.00
	Labour		59	10.43	615.00
	Hired	day	24	10.43	250.00
	Own	day	35	10.43	365.00
	Total (II):				

	Actual	3,600.00
	Actual minus imputed	3,235.00
III	Gross margin	
	Per Hectare	8,400.00
	Per Ton of Yield	336.00
	Per Own Labour Day	250.43
	Per Cash Cost	2.60

Similar to growing tomatoes, in organic spicy paprika a greater share of the costs of production occupying seed costs, biological resources protection and organic fertilizers, and the like. Also, the process of cultivating and tending, more commitment is required of human labor. Based on the calculations in the table 10 on the figure 4 shown occur more participation of certain costs in total variable costs of production spicy paprika. The main items of costs are biological and organic fertilizers (24%), cost of seeds (20%), funding for biodiversity protection (18%), and labour cost (17% of which own 10% and 7% paid), etc. In addition to gross margin in production, here is the calculation done drying, grinding and packaging spicy organic paprika per one ton. The analysis is the relationship fresh and ground paprika 10: 1, that is from 10 kg of fresh spicy paprika get 1 kg of ground spicy paprika. In the cost structure of organic ground spicy paprika dominate the cost of fresh spicy paprika as an input (60%), while the share of the cost of machine work (grinding mills and other) is about 13% of the workforce by 11%, and so on (Figure 4 and 5).

Figure 4 *Cost structure of production organic spicy paprika*

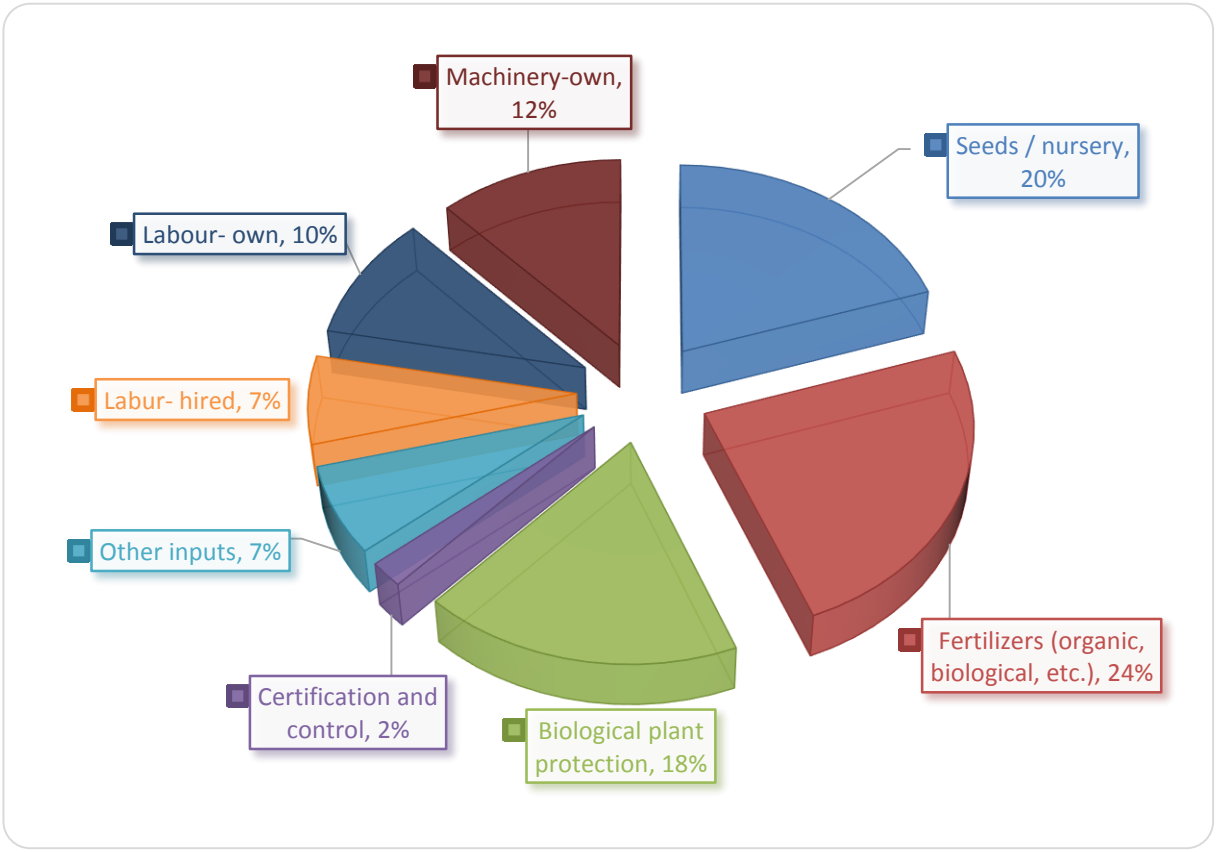
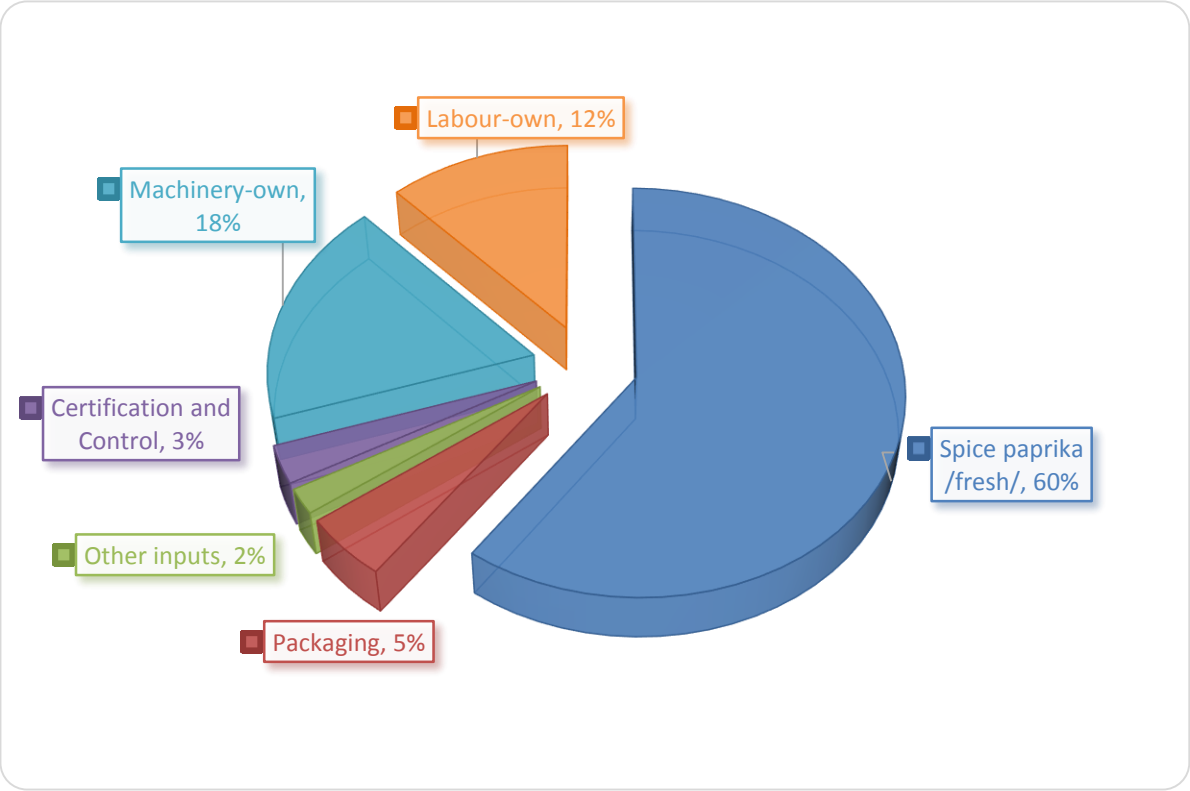


Figure 5 *Cost structure of processing organic spicy paprika*



When compared to what is more conducive to producers - that sells fresh organic or ground spicy paprika, can be seen from the analysis gross margin in the production and processing of organic spice paprika (Table 10 and 11). Analysis shows that more than four times achieves better margin coverage per one ton if sold ground (1,350 EUR/t) and not such fresh paprika (336 EUR/t). Thus, far better value added organic spicy paprika achieves its processing. Although the production of organic spicy paprika is economically viable for producers, processing is getting a higher profit for the same unit of measure.

Table 11 Gross margin of **processing (drying, grinding and packaging) of organic spicy paprika** per ton

	ECONOMIC INDICATOR	**UNIT**	**QUANTITY**	**PRICE (EUR/UNIT)**	***TOTAL VALUE* (EUR)**
I	Gross income				
	- ground *organic spicy paprika*	kg	100	18.00	1,900.00
	Total (I):				1,900.00
II	Variable costs				
	Spicy organic paprika /fresh/	kg	1,000	0.33	330.00
	Packaging				28.00
	Other inputs				12.00
	Certification and Control (50%)[1)]				17.00
	Machinery-own				100.00
	Labour-own				67.00
	Total (II):				550.00
III	Gross margin				1,350.00

Organic production of tomatoes and spicy paprika are profitably. Producers respect benefit of primarily crop rotation, organic fertilizers and much of the work processes that are done by hand instead of machines. Business in these industries provides a great accumulation of funds. In addition to quality, the producers of these products to a large extent provide the quantity and continuity for the domestic market.

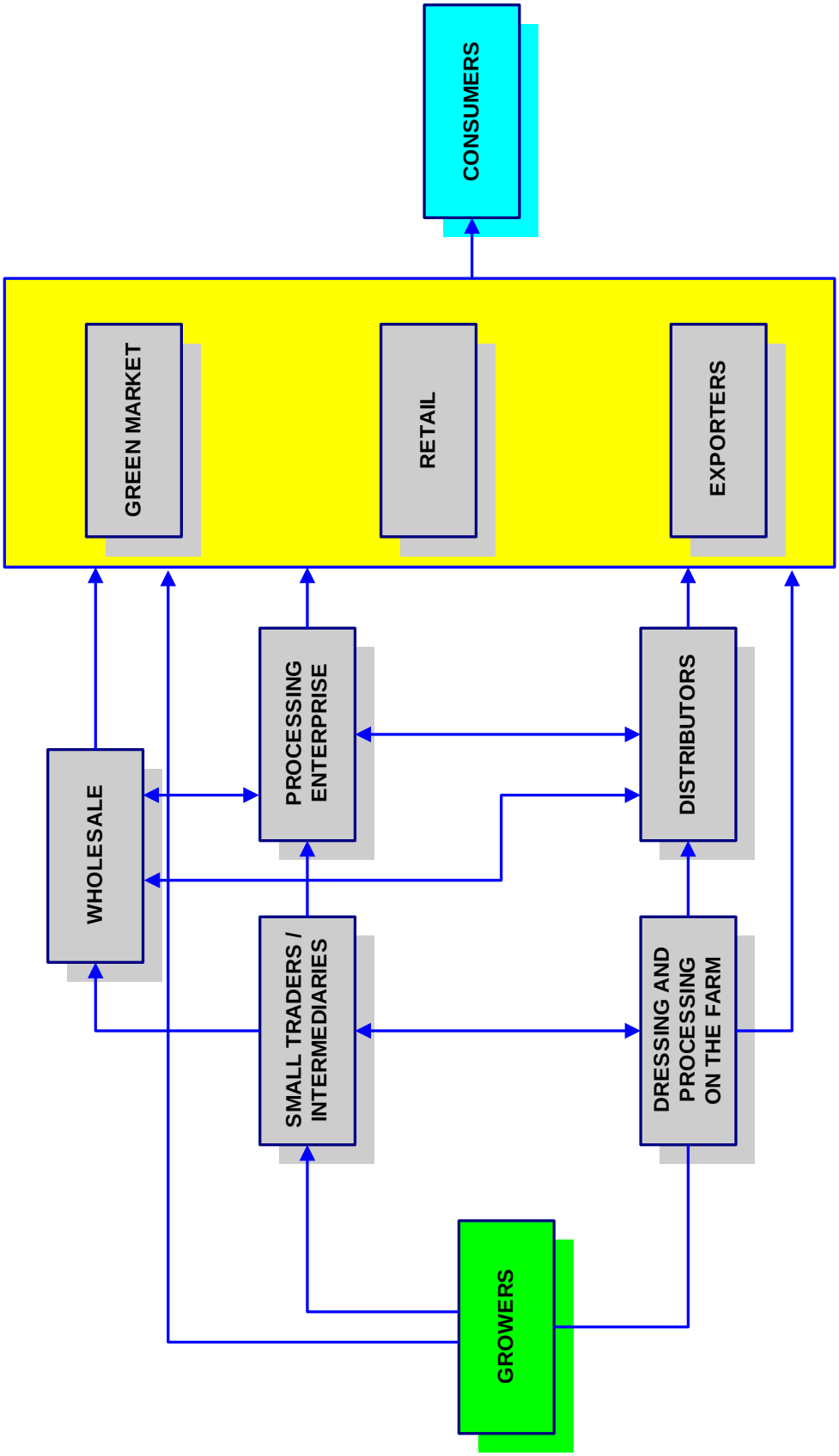


Figure 6 *Scheme of the value chain of organic tomatoes*

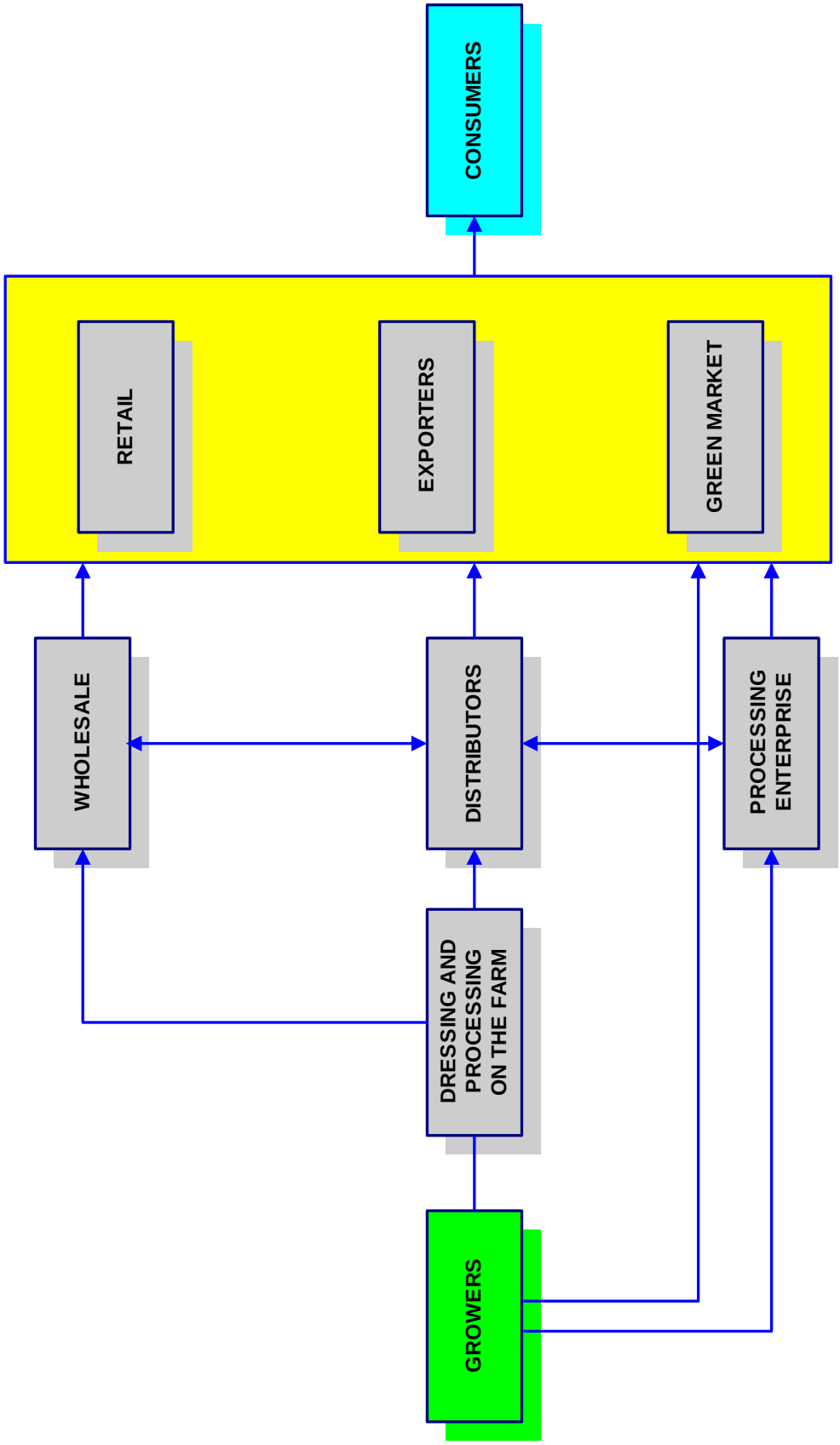


Figure 7 *Scheme of the value chain of organic spicy paprika*

5.2. The value chain of organic fruits specific to the region of Western Serbia

The Republic of Serbia has favourable soil and climatic conditions for the production of different types of fruits. The significance of this production lies in the fact that it enables better use of the land at various locations and regions with less favourable soil and climatic conditions, including soil of poor physical, chemical and other properties, as well as areas with steeper slopes. According to the Regulation on Nomenclature of Territorial Units for Statistics ("Off Gazette of the RS", no. 109/2009 and 46/2010, Article 13), the region of Western Serbia and Šumadija consists of eight districts: Zlatibor, Kolubara, Mačva, Moravica, Morava River, Rasina, Raška and Šumadija. The primary policy objective in the region is the economic empowerment and development of activities which have a comparative advantage, such as the production of fruits.

The area under orchards in Serbia occupies about 240,000 ha (Statistical Office of the Republic of Serbia, 2014). Serbia accounts for 20% of the total European production of raspberries, and in the domestic fruit production structure with 6.5%. According to the Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia, in 2014, the organic fruit production in Serbia is carried out on 1,527 ha, and 357 ha are in conversion. In the region of Western Serbia, 198.94 ha are under organic production and 235.19 ha in conversion. Relative to the total area under raspberry production in Serbia, 98% of the total production is located in this region. This is logical, because raspberries grow best in mountainous areas. 90% of the total production of raspberry in Serbia is exported frozen to the EU markets, Germany, France, the Netherlands, and Austria, and partly to the USA.

The presence of organic fruit production on representative farms and companies, data based on the results of interviews with the owners/company managers in the region of Western Serbia:

- Milenković Dragan from Krupanj – grows raspberries and blackberries on an area of 2.15 ha, 2/3 of the land under crops of raspberries, a 1/3 planted with blackberries. This is supplementary activity on this farm.
- Đuričić Vlada from Krupanj - grows raspberries and blackberries on an area of 0.8 ha. Also, organic farming is a supplementary activity on this farm.
- Oreščanin Predrag from Osečina, owned by "Frikos" D.O.O. – on an area of 48 ha raspberries, blackberries, plums and strawberries are cultivated. This is a supplementary activity for the company, as well as purchasing of products from organic producers in the region; the company generates 10% of revenue derived from organic products.
- Milutinović Zlatko from Ljubovija, owned by "Zadrugar" D.O.O. – on an area of 156 ha the following crops are cultivated: raspberries, blackberries and plums. In addition to its own production, the company is purchasing and selling organic products. The company generates 20-30% of the total revenues from the business activities related to organic products.

In addition to the above mentioned, there are a number of "small" producers in the region, who develop organic production on their farms, in addition to the main production, as supplementary activities. They generate certain income from organic products, but their existential status does not depend on this production. In this region there are forms of cooperative forms of association with the companies - purchaser or buyers. Linking of individual producers with and around the company – purchaser of products, consists in the presence of common interest, joint procurement of inputs, education, attending training seminars and sales of agricultural products. The objectives of producer groups are targeted at different levels of the value chain of agricultural products.

Starting with the inputs of agricultural production, value chain includes all business activities in the organic agricultural production, to processing and subsequent use and distribution of products to customers. All these activities aim to improve the profit of all economic stakeholders in the value chain, and customer satisfaction about the product.

To the associated group of producers, company which purchases their product assumes all responsibility for nearly all parts of the value chain; planning the production according to market demands in terms of quantity and quality; marketing of products produced by the producer of organic products; easier and cheaper procurement of inputs and protection of the environmental through implementation of good agricultural practices. The company was defined for its producer group the following: quality criteria for products; commercial activities; risks and benefits (e.g. prices of products); time limit for the successful establishment of producer groups (in real terms five years until a profit is generated); procedures and tasks to provide trust and confidence in decision making. In addition to the association of producers with the company purchasing their products, the producers can use their links to integrate horizontally and vertically also through other organizations and associations in the region. Most of these producers are members of the "Serbia Organica" and the like, and through them they obtain much useful information on trade fairs, promotion and other manifestations of organic products. Also, they access, through the associations, scientific, educational, political and other relevant institutions.

5.2.1. ORGANIC FRUITS PRODUCT SPECIFIC FOR THE REGION

Raspberry. The first plantings of raspberries according to organic production methods have been registered in Serbia in 1999. Raspberry production in Serbia is carried out mainly in the Central and Western parts of the country, with a total production ranging between 40 and 75,000 tons, depending on the year. Based on the available data it can be estimated that annually in Serbia 1,500 tonnes of organic raspberries are exported making up to 2% of the total production, i.e. conventional and organic production (Sredojević et al., 2013). Program of organic production is very close to the traditional way of producing from the aspect of inputs, but there are significant differences especially in the system of the process control. Only the product controlled and certified by an authorized inspection body can be put on the market labelled "organic product". For this program, which is very close to the traditional method of production, it is extremely important to choose a suitable area (hilly-mountainous area), conscientious producers who understand and are willing to cooperate. It is also very important to build a good system of internal control to monitor, guide and educate producers.

Proper selection of land/soil for raspberry is very important because it creates a strong, but shallow root system and a large number of shoots. For the establishment of raspberry crop planting material produced according to organic production methods is used. In the structure of raspberry varieties in Serbia, cultivar Willamette is dominant, with about 90%. This cultivar/variety is lush and creates a large number of vertical strips of medium and long elastic fruiting branches, which are rarely broken under the weight of fruit or under the impact of the stronger wind. It is Medium-early maturing, on average during the first decade of June. The fruit is medium-large, average weight about 4 g, rounded-conical, dark red, and firm, of sweet-tart flavour, aromatic and delicious. It is easily harvested and tolerates transport. The fruits are suitable for fresh consumption and various forms of processing. They are very suitable for deep freezing. Overripe fruits are used for the preparation of a great juice. In addition to the Willamette, other varieties, primarily Meeker, Skina and others, are becoming increasingly important due to their resistance to diseases and pests.

Harvesting of raspberries. Mature, healthy, whole and uniformly coloured fruits are harvested every other day, and when conditions are more favourable, every day. At the time of harvest the fruits must be completely dry. The fruits are stacked in clean crates and transported in a vehicle to the cold storage facility. In Serbia, frozen raspberries are dominating, and in this sense, the fruits are first cooled to 0 to 2°C, and then deep-frozen at -35 to -40°C. The fruits are stored at -18 to -20°C. Harvest time depends on the purpose of the fruit. The fruit intended for fresh consumption and freezing are picked a day or two before full maturity, while the raspberry fruits intended for the production of juices, concentrates and jams are harvested at full maturity.

Blackberry. Blackberry is a very interesting and economically important fruit species grown in many parts of the country. This is a cosmopolitan plant, thrives on all soil types and at all altitudes. Blackberry fruits have great practical value, technological and dietetic, and are suitable for a variety of industrial processing. It is an excellent raw material for the industry and for fresh consumption. Biological and productive characteristics of this fruit species make it very profitable and beneficial crop. Also, our country has favourable natural conditions for its successful cultivation on a wide area, both in the plains and in hilly-mountainous regions. However, existing natural resources are still very modestly used for cultivation of this crop. The high profitability of growing, advantage of natural conditions and the possibility of marketing/placing both fresh and processed blackberries on the domestic and international market in recent years has aroused the interest of a large number of producers for growing these fruits in a modern way.

The economic significance of the blackberry is the result of its genetic-biological and productive characteristics, which are reflected in the following: it becomes productive quickly; it bares fruits regularly and abundantly; fruits have great nutritional, technological and dietetic value, and are suitable and much sought for various forms of processing, deep freezing and for fresh consumption; production is safe, because the fresh blackberry fruits and its products can easily and favourable be marketed in domestic and foreign markets; it propagates easily and rapidly; cultivation is simple; and it is relatively resistant to diseases and pests.

The cultivar called Čačanska bestrna (Čačak Thornless), for many years was the leading variety in Serbia because of its yield capacity and pronounced resistance to low temperatures. It was created at the Fruit Research institute, Čačak. It is characterized by shorter ripening period so that it is able to present the entire crop even when grown at high altitudes. It is suitable for fresh consumption and for different types of processing. It is very rich variety and gives high yields over 20 t/ha even in poor growing conditions. Other varieties that are present in Serbia are: Black Satin, Thornfree, Dirksen Thornless, Hull Thornless and others.

Special attention is paid to the establishment of blackberry crops, because the profitability of growing these fruits depends largely on the selection of the location, soil preparation and proper selection of varieties. As a perennial crop, blackberries and raspberries remain in the same place for 10-15 years, so it is important to select a suitable place for establishment of these crops. To successfully and profitably grow blackberries it is necessary to set the support. The support is set in the second year after the planting, and consists of individual poles or pillars on which the wire is placed. Pruning of blackberry plant is necessary measure to ensure regular, abundant yields and good fruit quality. The necessity of pruning stems from its development character. It also develops plenty of vigorous shoots, which give fruits in the second year and, subsequently, dry.

Harvesting of blackberries. The total period ripening and harvesting of blackberries, in one plantation, as a rule, lasts between 30 and 40 days. The fruits do not ripen simultaneously, but successively, which is why harvesting of leading commercial varieties/cultivars in our conditions

is performed 5-7 times. Blackberries are harvested in the stage of technological maturity, i.e. when the fruit does not give resistance to picker when plucked off the stems. The determination of the true maturity of the blackberry fruits at harvest is particularly important because the maturity of the fruits directly reflects on the change in colour of the fruit during freezing.

Daily performance of the harvest (depending on these factors) in varieties ranges from 100-150 kg per worker for eight-hour day, and in varieties with thorns 40-80 kg. The Extra quality fruits are uniform size, maturity and colour, of pure variety, stem-free and handpicked. One package allows up to 5% of the fruits that do not comply with the requirements for this class, but fulfil the requirements for the subsequent, lower class. Fruits of Quality I must have approximately the same characteristics as the fruits of the extra quality, the only difference is that the package allows up to 10% of the weight fruits that are not eligible for this class, but correspond to class II. Fruits of Quality II must be healthy, clean and fully mature, with some deficiencies regarding the shape of the fruit. The packaging unit can contain up to 20% of over-ripe fruits, up to 10% of the weight the fruits with sepals, as well as at most 5% of wormy fruits. In recent years, cold storage facilities usually graded blackberry in the first and second quality class. Given that the predominant quantities of harvested fruits are exported, producers, in addition to the standard for organic products, also adhere to international quality standards, which are quite often changed and revised.

5.2.2. PROVIDING INPUTS

With regard to procurement of inputs and sales of finished products, producers of organic raspberries and blackberries in the region of Western Serbia have specific contracts, which in a certain way relieve them of a number of risks. The major companies in the region, "Zadrugar", "Frikos" and others bring together a large number of individual producers in primary agricultural production. These companies have contracts with individual producers, in which they have committed to provide inputs for the producers and purchase from them raspberries and blackberries as products realized in the contracted production. In this way, by "offsetting" between the payables and receivables for inputs and outputs in their mutual relation, cash payments are avoided, in a form of commodities trade /exchange. Certainly, in financial terms, it benefits both producers and companies. In addition, producers have ensured buyer for their product and this motivates them to get involved in this production. Of course, in addition to achieving adequate economic benefits, producers are motivated by the fact that they can use arable land that is not suitable for intensive fruit or conventional production in a profitable way. The incentives that they receive from the Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia represent additional motivation. It is important to emphasize that the relationship between producers of organic raspberries and blackberries and companies that purchase their products, in addition to the signed contract, is based on a considerable mutual trust. Although the supply of inputs, certification, inspection, extension and purchasing of product is under the competence of the companies, producers are aware of the risks for their production and for the company, if they would fail to comply with the rules and methods of organic production. Therefore, they are trying to maintain the gained confidence and it can be said that these cooperative relations are an example of good practice.

5.2.3. PRODUCTION LEVEL

The volume of production (yield per unit area) of organic raspberries and blackberries is satisfactory, in average 4.9 t/ha of raspberries and 12 t/ha of blackberries. According to SORS, in the period 2009-2013, the producer price of conventional raspberry and blackberry fluctuated from 0.80 to 1.60 EUR/kg, while sales price in the green market from 1.20 to 1.55 EUR/kg. Based on information from the interviews, the price of organic raspberries and blackberries in that period were 30 to 40% above the price of conventional production, but also fluctuated. Purchase prices

for organic raspberries in 2014 were in the range 1.8-1.9 EUR/kg and for blackberries 1.5-1.6 EUR/kg. The technology of production is controlled by experts hired by contractors, i.e. buyers of their products. Also, the certification of production is specific. The certification is carried out collectively for all related productions, whose owners have a contract with the same company - contracted buyer. In fact, the company purchasing the products is the holder of the group certificate. Given that the company will perform final processing and sales of products from organic raspberries and blackberries, generally, they have the certificate for production and processing. For international markets, they have certificates that are required in the importing countries.

5.2.4. PROCESSING

There are no accurate data on the number of cold stores in Serbia. Based on data from the Ministry of Agriculture, Forestry and Water Management, in 2011, in Serbia there were 363 cold storage facilities for freezing, i.e. storage of fruits, vegetables and mushrooms, with a total capacity of about 550,000 tons. The capacity utilization is around 75%. Finishing and processing of organic raspberries and blackberries, is performed by the companies which are purchasing the products and have a cold storage or processing line. Such fruits, mostly frozen, are placed on the EU and USA markets. The cold storage "Sirogojno company" and forty agricultural households in Zlatibor village of Sirogojno have international certification for production of organic raspberries, granted to them by the representatives of Swiss control house "SGS". "Sirogojno Company" purchases and processes about 5,000 tons of fruit, mainly raspberry and blackberry, about 97% of the purchased quantity is intended for export. Specially packaged raspberries produced by this company, have found their place in supermarkets in Sweden, Finland, Norway, the UK, Belgium, Japan and Australia.

In Serbia, 85 companies are engaged in the hot processing and drying of fruits and vegetables, as well as in the production of juices, with a total installed capacity of approximately 565,000 tons. The capacity utilization is about 50%. A significant part of the processing capacities is related to the production of fruit and vegetable juices. The annual production capacity of fruit juice is around 240 million litres, which places Serbia among serious producers in the region. Producers, who don't have contracted cooperation with buyers, sell their products directly to customers in their households/farms. If they have a smaller volume of production, they often make various jams, juices and similar products, and sell them by order, to known buyers. Also, they bring their products to local green markets. Despite the successful production, good placement/marketing, processing of organic raspberries and blackberries is not at satisfactory level. First of all, the degree of processing can be higher; to obtain the product ranges of specified origin. Also, the packaging is not sufficiently aligned with the efficiency of value-added products.

5.2.5. DISTRIBUTION

Distribution chain for organic raspberries and blackberries in the region of Western Serbia is mostly created by companies – product buyers. For primary producers, the sale product comes down to the direct contact with a representative of the company – product buyer. The producers who are not part of the cooperative chain sell their products through other channels. Since these products are difficult to preserve, the sale is most often contracted before the product is due to be delivered.

A significant number of private companies in Serbia engaged in purchasing and processing of organic raspberries have introduced the system of food safety control (HACCP - Hazard Analysis and Critical Control Points). Also, some of them have introduced the GLOBALGAP standard that applies to segments of primary agricultural production. GLOBALGAP standard defines the framework for the application of the rules of "good agricultural practices" which are acceptable to the

wholesale and retail systems in the world. Through the application of this standard, all acceptable methods of integrated control of harmful organisms are included in the commercial agricultural production system, which should contribute to the long term sustainability of production. This standard supports the principles of HACCP and encourages their use. The standard is divided into 14 parts (traceability, recording and internal inspection, seed and planting material, the history of the field, the soil, the use of nutrients, irrigation, crop protection, harvesting/picking, handling products, waste and recycling, safety and welfare of workers, protection of the environment and appeals) and provides for about 210 control points which are divided into primary (compulsory), secondary and recommendations. Agricultural producers of organic products tend to maintain their commitment to: maintain consumer confidence related to the quality of food and its safety; minimize adverse impacts on the environment and the rationally use natural resources.

5.2.6. COST-BENEFIT ANALYSIS

Comparative analysis of gross margins of organic and conventional raspberry production

In the conditions of conventional farming raspberries, presents one of the strategic product and its production in western Serbia, especially of raspberries from Arilja, Serbia is famous in the world. This product is valid for heavily searched and profitable production. It is mainly grown in smaller areas, to one hectare. For many family farms, raspberry makes the main or even sole source of income. This fruit species requires care and protection throughout the year. Due to the sensitivity of the fruit to the temperature and other climatic factors during the maturation period, the most frequently hired seasonal workers to quickly reaping the benefits. In the tables 12 and 13 the date calculations cover margins per hectare and other units of raspberry. Calculations are made according to the technological operations, inputs, outputs and with the current prices, in the organic and conventional production.

Table 12 *Gross margin of* ***organic raspberry*** *production in 1 ha area*

	ECONOMIC INDICATOR	**UNIT**	**QUANTITY**	**PRICE (EUR/UNIT)**	***TOTAL VALUE* (EUR)**
I	Gross income				
	- *Yield*	t	7.50	2,400.00	18,000.00
	Total (I):				
II	Variable costs				
	Fertilizers (organic, biological, etc.)				2,215.00
	Biological plant protection				1,970.00
	Certification and Control				165.00
	Other inputs				820.00
	Machinery-own				1,395.00
	Labour		109	15.00	1.635.00
	Hired	day	49	15.00	735.00
	Own	day	60	15.00	900.00
	Total (II):				
	Actual				8,200.00
	Actual minus imputed				7,300.00
III	Gross margin				
	Per Hectare				9,800.00
	Per Ton of Yield				1,307.00
	Per Own Labour Day				178.33
	Per Cash Cost				1.34

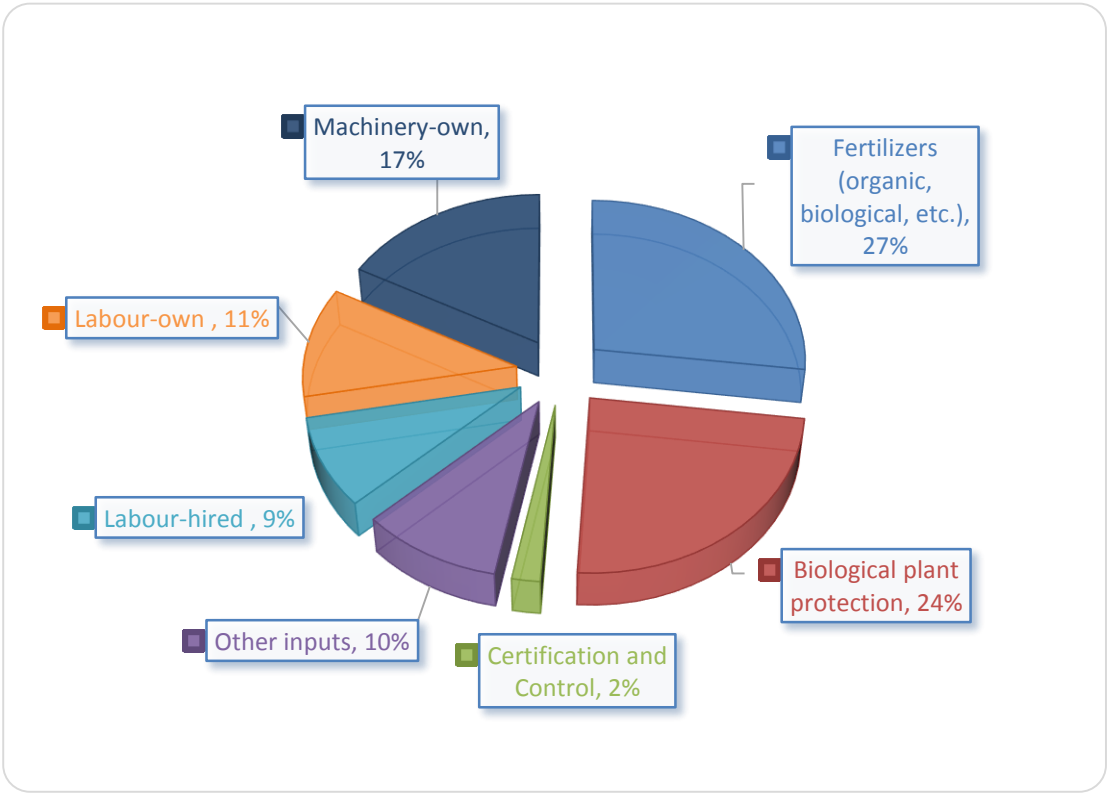
Table 13 *Gross margin of* ***conventional raspberry*** *production in 1 ha area*

	ECONOMIC INDICATOR	**UNIT**	**QUANTITY**	**PRICE (EUR/UNIT)**	***TOTAL VALUE* (EUR)**
I	Gross income				
	- Yield	t	12.00	1,400.00	16,800.00
	Total (I):				
II	Variable costs				
	Fertilizers (total)				2,230.00
	Pesticides (total)				1,860.00
	Other inputs				560.00
	Machinery-own				2,610.00
	Labour		136	15.00	2,040.00
	Hired	day	62	15.00	930.00
	Own	day	74	15.00	1,110.00
	Total (II):				
	Actual				9,300.00
	Actual minus imputed				8,195.00
III	Gross margin				
	Per Hectare				7,500.00
	Per Ton of Yield				625.00
	Per Own Labour Day				116.28
	Per Cash Cost				0.92

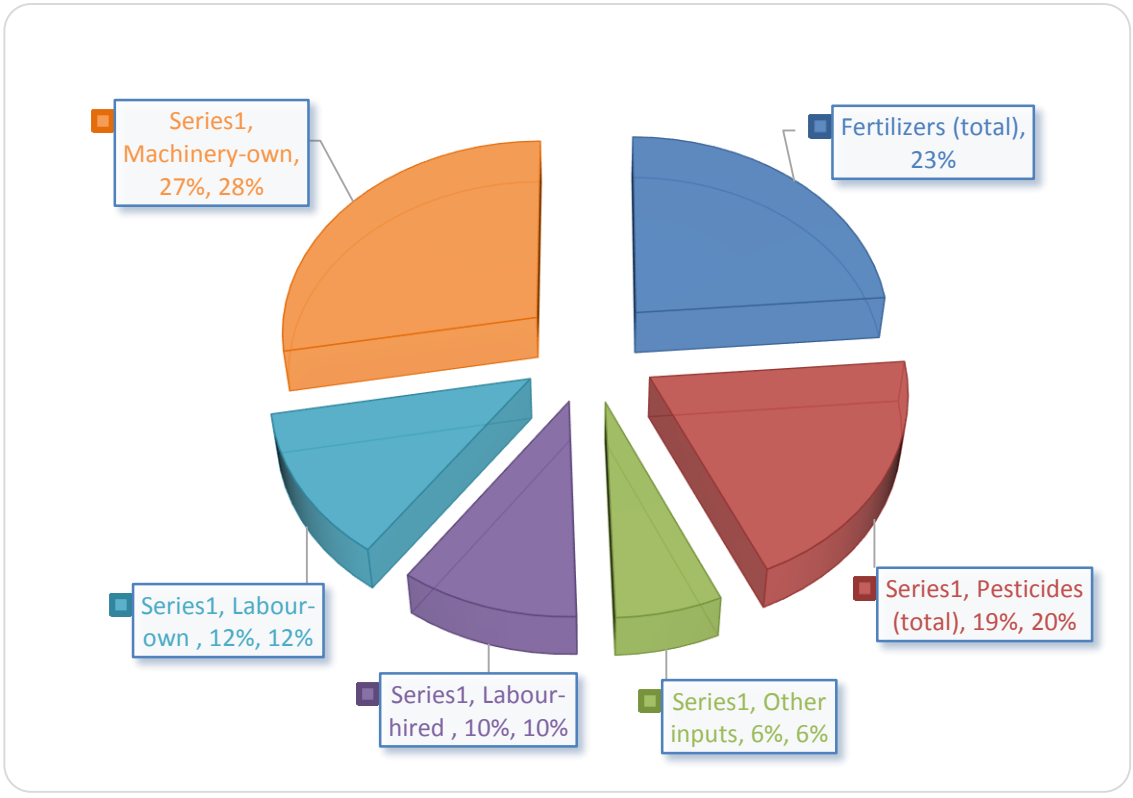
According to the calculations, due to reduced intensive of agricultural measures of practices, yield of raspberries in organic production is about 30% lower than in conventional production conditions. Also, expensive biological plant protection and fertilizer, which increases the production. In addition, in the region where it is grown raspberries, missing labor force, and at harvest time, producers are often forced to pay high wages for an engaged workforce. Despite these problems, organic raspberry is required and with a high sales price, this production provides a better margin of coverage compared to the conventional (9,800.00 EUR/ha > 7,500.00 EUR/ha.) Structure of variable costs for individual ways of growing raspberries can be seen in the figure 8.

Figure 8 *Cost structure of production organic raspberry in different ways*

- organic production -



- conventional production-



Source: Based on data from the calculations in the table 12 and 13

In spite of good profits, growing organic raspberries in the future in the region of Western Serbia is uncertain. Insecurity caused by the producer and uncertain purchase price. Because of the difficulty of storing and delicate fruit, producers are forced to sell raspberries and at a lower cost. However, in such cases, do not receive the right amount of profit. Due to the loss of economic benefits, there is a risk that in the future, with an organic oriented to conventional production to achieve higher yields

Gross margins of production and processing of organic blackberry

In the region of western Serbia, near the raspberries and blackberries is a significant of berries. After growing technology, blackberry is less demanding compared to raspberries. Although, blackberry and requires a lot of involvement of human labor. Gives this product is still grown less and less sought to market a far greater commercial value achieved in the processed products. Often the producers themselves blackberry real variety of jams, marmalades, syrups, wine and more products of blackberries and to advance the well-known customers. Therefore, in this case for the blackberry and calculations gross margin of production and it's processing (Table 14 and 15).

Table 14 *Gross margin of* ***organic blackberry*** *production in 1 ha area*

	ECONOMIC INDICATOR	**UNIT**	**QUANTITY**	**PRICE (EUR/UNIT)**	***TOTAL VALUE* (EUR)**
I	Gross income				
	- *Yield*	t	14.00	1,100.00	14,700.00
	Total (I):				
II	Variable costs				
	Fertilizers (organic, biological, etc.)				1,400.00
	Biological plant protection				1,260.00
	Certification and Control				140.00
	Other inputs				845.00
	Machinery-own				1.120.00
	Labour		149	15.00	2,235.00
	Hired	day	70	15.00	1,050.00
	Own	day	79	15.00	1,185.00
	Total (II):				
	Actual				7,000.00
	Actual minus imputed				5,815.00
III	Gross margin				
	Per Hectare				7,700.00
	Per ton of yield				550.00
	Per Own Labour Day				112.47
	Per Cash Cost				1.32

In the structure of production costs blackberries, taking the largest share of the cost of fertilization, the workforce and the protection of biological resources. Processing, in addition to the cost of the main raw material (fresh blackberries), the share of other costs depends on the type of products. In this case, when processed into wine, take the relationship to 5 kg of blackberries with one liter of blackberry wine. In this case, the cost of processing, fresh blackberries as a raw material in manufacturing costs accounted for 40%. In addition to fresh blackberries, for processing into wine, a lot of hiring labor (23%) and other material about 15% (water, packaging, etc.).

Figure 9 *Cost structure of organic blackberry production*

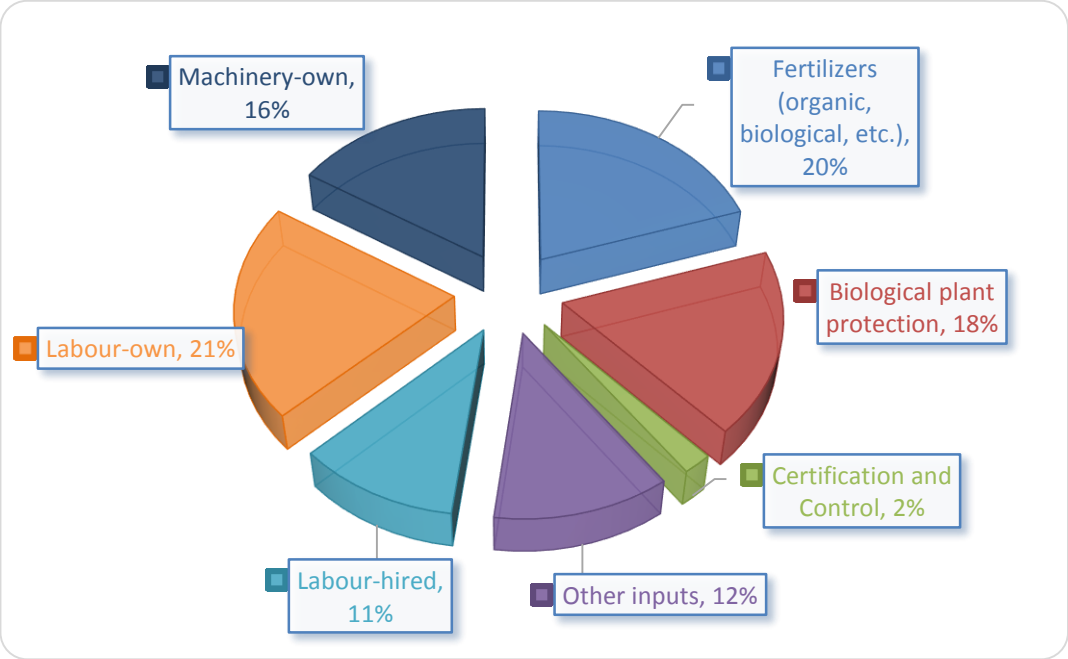
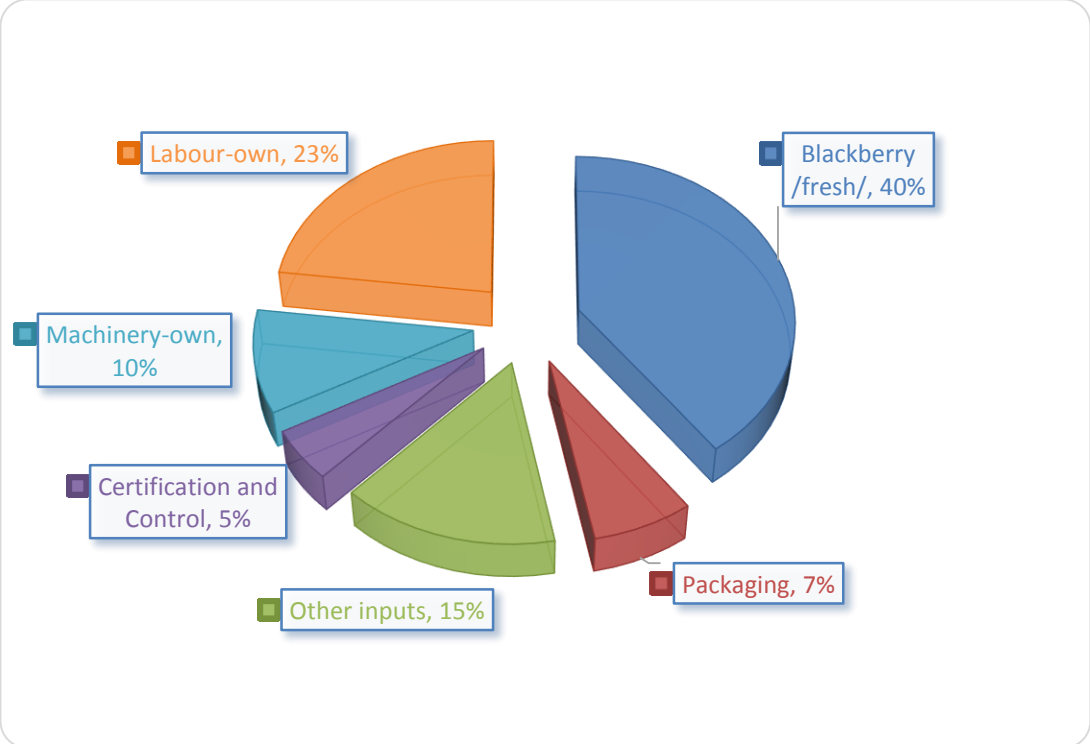


Figure 10 *Cost structure of organic blackberry processing*



It is important to emphasize that in such products, special attention is given to the packaging and design. In Serbia, a lot of organic products sold in larger containers and in bulk, which reduces the value of the product itself.

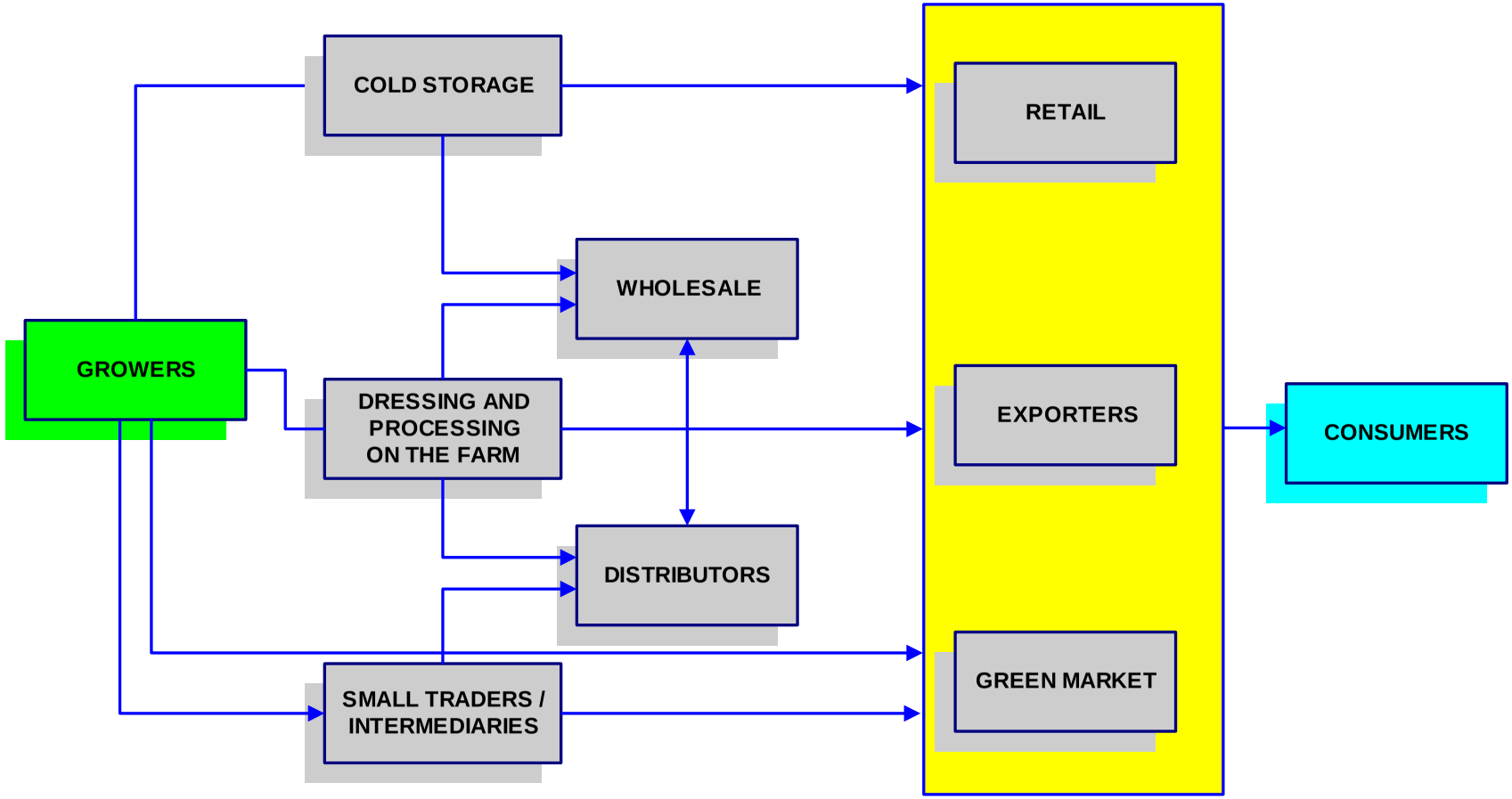
Table 15 *Gross margin of* ***processing organic blackberry*** *per one tone*

	ECONOMIC INDICATOR	**UNIT**	**QUANTITY**	**PRICE (EUR/UNIT)**	***TOTAL VALUE* (EUR)**
I	Gross income				
	- blackberry wine	l	200	2.10	4,200.00
	- husk /by-product/	kg	100	-	-
	Total (I):				8,000.00
II	Variable costs				
	Blackberry /fresh/	kg	1,000	0.90	900.00
	Packaging				160.00
	Other inputs				335.00
	Certification and Control (50%)*)				70.00
	Machinery-own				225.00
	Labour-own				515.00
	Total (II):				2,250.00
III	Gross margin				1,950.00

Processing of fresh blackberry in wine receives almost four times the value of the gross margin per ton of blackberries (1,950.00 EUR/t > 550 EUR/t). In addition to nutritional value, blackberry wine has medicinal properties and is used for medical purposes. The possibility of marketing fresh and processed organic blackberries in Serbia, are still above utilized potential of its cultivation and therefore the treatment.

The value chain of organic produce fruits of western Serbia, from production to sales and participants in the value chain can be seen in the figure 11.

Figure 11 ***Scheme of the value chain of organic raspberries and blackberries***



5.3. The value chain of organic fruits specific to the region of Southern Serbia

The region of Southern and Eastern Serbia consists of several administrative districts, namely: Bor, Braničevo, Zaječar, Jablanica, Niš, Pirot, Danube River, Pčinja and Toplica district. Southern Serbia is one of the least developed areas of Serbia. According to the OECD classification, it belongs to the typical rural areas. About 55% of the total territory of the Southern Serbian is arable land, of which 80% is privately owned. The agricultural production in the region is of the traditional type. The structure of agricultural land is characterized by a many fragmented land properties. The number of households/farms with more than 3 ha of arable is very small, also in mountainous areas.

The dynamic processes of deagrarisation (agricultural regression) of population have not been used in the past to improve the agricultural structure of private farms. Nowadays, in some households, the owners are not able to ensure the necessary minimum of cash income to meet basic needs, much less funds to invest in the development and consolidation of agricultural production. The favourable climatic and soil conditions benefited the development of the traditional production of fruit with a large number of fruit species. The most common are cherry, plum, apple, pear, walnuts, peaches, cherries and apricots. The problem in the organic fruit production in this area is the age structure of producers. Most of them are over 55 years of age and are not motivated to invest in the development and improvement of the production.

Based on the interviews with the producers from the region of Southern Serbia, the surfaces under the production of organic cherries and plums on selected family farms are listed:

- Simić Vučina from Blace – on an area of 8 hectares the organic plum, cherry, pear, apple and quince are produced. These are the main activities and main source of income on the farm.
- Milenković Saša from Blace – on an area of 5.5 hectares the organic plum, cherry, apple and quince are produced. In addition to 20 ha of land owned, the farmer leases another 20 ha for livestock production, and organic fruit production is additional activity.
- Simić Dragan from Blace – 4.15 ha of the available 20 ha of arable land, is used for cultivation of organic plum, apple and pear. These are supplementary activities on farms.
- Radovanović Radovan from Kuršumlija – on an area of 0.45 ha organic cherry is produced as a secondary production and supplementary source of income on the farm.

In addition to the above mentioned producers, interviews were conducted with several others, who are engaged in the organic production of fruits on an area less than one hectare. There are a lot of similarities among the producers in terms of motivation to engage in organic production, the volume and structure of production, and generally, in practice, they are faced with the same or similar problems. It is important to point out that the larger surface area under organic production are owned by two cold store facilities that operate in the region: Lion Foods (formerly Den Yuro) and Midi Organic. For example, Lion Foods, in addition to its main operation, has developed production of organic fruit - plum, cherry, raspberry, blackberry, apple and strawberry, on 300 ha and.

There are several associations of fruit producers in the region, such as the Association of Fruit Producers of the Municipality Merošina "Oblačinska višnja" (Oblačine sour cherry) and the Association of Fruit Producers of the Municipality Svrljig "Eko voće" (Eco Fruit) and others. However, the majority of producers of organic cherries and plums are oriented towards and centred on subcontractor cold storage companies who purchase their products. The cold storage companies, same as with producers of blackberries and raspberries, are holders of group certificates for production and processing. The producers have input-output exchanges with cold storage companies/facilities, also have various other benefits, such as technical and advisory support, educational training and the like, as regulated by the contract and built confidence. Thus, the cooperative business model like with the producers of raspberries and blackberries stimulates and motivates fruit producers to increase the area under organic production.

5.3.1. ORGANIC FRUITS PRODUCT SPECIFIC FOR THE REGION

Sour cherry. In regard to its commercial importance and economic effects, sour cherry fruit is the third significant fruit species in Serbia, after the plums and apples. In recent decades, its production has been growing, primarily due to the expansion of the domestic variety “oblačinska višnja” (Oblačine sour cherry) that is easily propagated through shoots, and characterized by early yielding, produces abundantly and fruit is of excellent quality. The growth of production was accompanied by the growth of exports, so that Serbia is now a significant exporter of cherries. This is favoured by the fact that the price of cherries in recent years is relatively high.

Sour cherries have a high biological value because of their composition: 12-22% dry matter, 10-13% sugar, 1 to 2.4% organic acid, 0.7 to 1.9% protein, about 0.5% mineral matter, about 15 mg of vitamin C, a substantial amount of coloured substances and other useful substances. It is suitable raw material in the food processing industry used in production juices, compotes, confectionery, liquor, for freezing and drying. It can also be used as a table fruit.

In terms of location and quality of land cherry is very modest fruit species (low requirements), so that it can be successfully grown in all terrains. The shoots and buds are less sensitive compared to other drupe fruit species. However, open fields are more suitable for the cherry production than closed. It grows best on the hills and gentle slopes facing south, south-east and east. It is successfully grown on almost all soils. The variety is the key factor for achieving yields of good quality and compliance with standards during production. When choosing varieties, care is taken to preserve biodiversity, which is one of the basic principles of organic production. The selection is influenced by the following properties of the varieties/cultivars: yield, fruit size, fruit resistance to handling during harvesting and packing, the flowering and ripening, resistance, i.e. tolerance to cherry diseases and pests. Often in cherry crops other cover crops are grown that have a positive impact on the conservation of populations of useful insects, nitrogen fixation, keeping moisture in the soil, realization of good water and air regime, etc.

Harvesting/Picking is done when the fruits reach optimum coloration and firmness, a characteristic of the variety. The parameters used for the determination of the moment of harvesting are: the epidermis and the hardness of the colouring of the fruit (flesh). Harvesting/Picking is done with as little mechanical damage to the fruit, taking into account the aesthetic characteristics of the fruit. Cherry intended to be used in the fresh state, has a certain quality at harvest, such as coarseness and uniformity of fruit, hardness, colour, good taste, etc.

Plums have been grown in Serbia for centuries. This is the most common type of fruit in Serbia, and has the highest economic importance. The most cultivated variety is Stanley. In addition to the great and versatile use value and high quality, the easy propagation of shoots and self-compatibility has contributed to the distribution of this fruit species. Plum fruits are used as a first-

class fruit raw material for industrial processing. The fruits contain up to 75% of water and up to 25% of dry matter. The percentage of acid and sugar is different even in fruits of the same variety, depending on climate and soil conditions.

Plum of the variety Požegača is important for export in fresh condition, and dried fruits are a product of high value. Its economic importance lies in the fact that it can be produced in hilly areas of sharper relief, it bears early and abundant fruit, and the tree has great practical value in the timber industry. In the production it can adapt many crowns. Which system of growing will be applied depends primarily on the planned crop management (applied agro-technical measures and practices) and environmental conditions.

Harvesting and Picking. Given the variety and purpose, the fruits are harvested in a botanical and economic maturity, which is determined based on the size, taste, content of dry matter, sugar, acid and pectin. Fruits for consumption in fresh condition and processing into compote and jams are harvested in the stage of botanical ripeness. For nearby markets, the fruits can be harvested mature, and for more distant markets, greener fruits are picked. Fruits intended for processing and production of brandy, jam, jelly, marmalade, juice and similar products, as well as for drying, are harvested at the stage of technological maturity, and that's when the crown contains 5 to 10% of softer fruits. Harvesting is done by hand and shaking. Hand-harvested are fruits intended for use in the fresh state, which are the highest quality and most expensive method of harvesting. Shaking as a method of harvesting is used for harvesting of fruit for processing and drying. It is carried out manually or mechanically using special machines - shakers. After harvesting, the classification is carried out based on the European Protocol on standardization of fruit (extra class, class I and class II). The extra quality means fruits that are uniform in size, maturity and colour, varietal dirt, stem-free and handpicked. One package allows up to 5% of the fruits that do not comply with the requirements for this class, but fulfil the requirements for the subsequent, lower class. The fruits are graded, depending on the mode of production and placement/marketing purposes. Depending on the purpose of the fruits and all other factors, the worker during a single day can pick from 200 to 500kg.

5.3.2. PROVIDING INPUTS

In Serbia, mainly the standard planting material is produced, and to a lesser extent, tested and virus-free planting material. Currently, the structure of the representation/share of varieties of produced cherry and plum seedlings is inadequate. The big problem in the past was the inadequate and defective planting/seeding material from the aspect of varieties/cultivars, which had a negative impact on the production. Legislation in Serbia has enabled the production of planting material exclusively by the legal persons and entrepreneurs, and today, more than 310 companies are engaged in the trade and import of planting material, and about 240 companies are engaged only in the production of seedlings. The sale of seedlings in the marketplaces is forbidden, there are defined selling points, and certificates are introduced issued by the Ministry of Agriculture, Forestry and Water Management of Serbia (Plant Protection Department). The state guarantees to the buyer with this certificate that each seedling is healthy and in compliance in regard to the standards of the variety. All this has contributed to the gradual reorganization of the production of planting/seedling material, to the trust of farmers and with financial favouring of the certified planting material, because subsidies for certified planting material are higher compared to the standard material, there has been an increased demand for certified seedlings and interest of seedling producers. In Serbia there are 287 registered nurseries involved in the production and trade of planting material for all species of fruit.

When establishing the cherry and plum crops, which are intended for organic production, it is compulsory requirement to use the certified planting material. Substrate and graft branches of such planting material/seedlings are produced according to the program for the production of planting material which includes rigorous controls and testing for the presence of disease-causing agents and pests. Pursuant to the Rulebook on the control and certification of organic production and organic production methods ("Off Gazette of RS", No. 48/11), the use of planting material from their own production is only allowed on condition that such planting material is produced in accordance with organic production methods. Production of planting material of fruit in the region of Southern Serbia is very limited and producers are purchasing seedlings and other inputs for regular production mainly through suppliers/buyers with whom they are in cooperative relations, in the same way as the producers of blackberries and raspberries in the region of Western Serbia.

5.3.3. PRODUCTION LEVEL

The average yield in the production of organic cherries and plums in the region does not deviate from the average yields obtained in the conventional production. For the sour cherry (Oblačine sour cherry) as the leading variety in the region, the yield is 12-15 t/ha. In production of plums, depending on the variety, cultivation form, application of agricultural techniques and practices and other factors, the yield ranges from 15-18 t/ha. Sale (purchase) price of cherries and plums is formed on the basis of an agreement between producers and purchasers. For producers, the starting point for a commercially acceptable lowest purchase price represents the cost price, or the cost of production per unit of yield. The cost depends on utilization of inputs in regular production (the amount of fertilizers and biological plant protection, operation of machinery, manpower, packaging, etc.), as well as their prices. It is important to point out that producer of organic cherries and plums operate and have a cooperative contract with the purchasers according to the same model and the principles as the producers of organic raspberries and blackberries in the region of Western Serbia. This has already been discussed in the chapter on the value chain of organic fruit specific to the region of Western Serbia, so there is no need to repeat it in this chapter.

According to the data SORS (2014) in the period 2009-2013 producer prices sour cherries and plum from conventional production were significantly fluctuated from 0.20 to 0.90 EUR / kg, and the redemption 0,20-0,50 EUR/kg. According to the interview, in that period, the price of organic sour cherry and plum were above the price of the conventional 20-40%, but a similar trend as from conventional production.

5.3.4. PROCESSING

Even though there were significant capacities for fruit in this area, in the past, it can be said that the period of crisis during the nineties of the last century, as well as unsuccessful ownership transformation, have led to the fact that today fruit processing is reduced to only a few active companies. The company "Ni-com" doo Niš is engaged in purchasing of fruit, production and export of frozen fruits (IQF strawberries, plums - machine and handpicked, IQF raspberries, IQF blackberries and IQF cherries pitted). "Voćar" Merošina, although it has introduced HACCP quality system, has been working over the last years with only 30-50% of capacity. Hence, the favourable conditions for the provision of variety of fruits as raw materials for the food industry in the region are not sufficiently utilized. Processing facilities are mainly located in urban areas and there is lack of balance between the production and needs of the processing industry.

The production of organic cherries and plums in this region is focused on the organized purchase. Plum and cherries are purchased from the primary individual producers by their subcontractors,

cold storage companies Lion Foods and Midi Organic. These companies, as noted above, own land areas under organic cherry and plum. Organic cherries and plums are mostly frozen and placed/marketed abroad. Plum is partly dried. The lack of modern packaging machines and packaging certified in accordance with European standards on food safety and organic products significantly reduces the competitiveness of the final product. Frozen organic cherries and plums are exported in large packs of 10 to 15 kg. Drying is one of the best ways of realization of plum production, even in the conventional production. In commercial production, modern drying facilities of various types and capacities are used. Unfortunately, the producers in this area do not have adequate drying facilities for drying plum fruits. The family farms in the region, use relatively outdated, but effective, dryers, which use wood as an energy source. During the drying process the moisture content is reduced to about 18%. One kilogram of dried plums should be about 3kg of fresh fruit. These products are sold directly to consumers or to the green markets. Higher profits can be generated in production of organic plums and cherries through their processing and marketing of processed products, such as compotes, jams, marmalades, juices, syrups, spirits, liqueurs, etc.

5.3.5. DISTRIBUTION

Organic cherries and plums produced in Southern Serbia are sold through various channels to customers. Most of the produced organic fruit is purchased by cold storage companies, trade companies, processing companies, and many are sold in local or urban green markets. However, producers of organic cherries and plums in the region of Southern Serbia are not independently engaging in commercially-oriented agro-food chain. Due to the small scale of production they cannot provide the amount of product for continuous supply of customers. With the advent of modern retail chains, suppliers of fruits and vegetables are increasingly exposed to their complex requirements in terms of delivery conditions, such as the price, quantity, quality and deadlines. In this context, a major challenge for producers of organic products is the ability to meet the set requirements, in order to maintain the highest possible participation in meeting the domestic demand. Since their market position is crucially determined by the volume and quality of supply, we can expect more integration both within the primary sector, and their stronger links with trade retail chains.

5.3.6. COST-BENEFIT ANALYSIS

Comparative analysis of gross margins of production of organic and conventional sour cherry

Taking into consideration that the quantity of inputs is affected by the terrain configuration on which the fruit crop is established, the condition of crops, cropping phase period, the number of trees per hectare, distance from the site of the procurement of inputs, etc., the cost varies per unit of yield and area under cherry and plum crops.

Certainly, it is in the interest of the producer to keep the cost as low as possible on the one hand, and to achieve a higher sales (purchase) price, on the other hand. The production is more profitable for producers if the mentioned difference is greater. How successful the producer will be depends on a number of factors. Due to the climatic influences, yields can vary significantly, which directly affects the cost price and the purchase price. Also, the parity of input and output prices, supply, demand, competition, currency stability and others, also directly or indirectly affect the ratio of the cost and the purchase price of cherries and plums.

According to the data obtained from the interviewed producers in the region of Southern Serbia, in 2014, for both fruit species, the costs of harvesting which is done manually had a high share in

the cost structure. The harvest costs account for about 35% in the cost structure of the cherry and plum organic production. On the other hand, delayed/late harvesting can lead to large losses. Since the purchase price are different for different fruit classes, a huge savings in production costs, and therefore lower cost price, can be achieved by the procurement of adequate packaging for fruits and timely delivery to buyers /purchasers. Often, due to poor packaging, there is damage to the fruit, and this entails the risk that the majority of the yield is purchased from the primary producer as a product of lower-class, or as the product of conventional production.

Based on the calculations and identified indicators of economic feasibility of sour cherry, it can be concluded that positive gross margin per hectare achieved in both way production of organic and conventional (Tables 16 and 17).

Table 16 *Gross margin of* ***organic sour cherry*** *production in 1 ha area*

	ECONOMIC INDICATOR	**UNIT**	**QUANTITY**	**PRICE (EUR/UNIT)**	***TOTAL VALUE* (EUR)**
I	Gross income				
	- *Yield*	t	12.00	600.00	7,200.00
	Total (I):				
II	Variable costs				
	Fertilizers (organic, biological, etc.)				510.00
	Biological plant protection				600.00
	Certification and Control (50%)*)				60.00
	Other inputs				300.00
	Machinery-own				480.00
	Labour		70	15.00	1,050.00
	Hired	day	30	15.00	450.00
	Own	day	40	15.00	600.00
	Total (II):				
	Actual				3,000.00
	Actual minus imputed				2,400.00
III	Gross margin				
	Per Hectare				4,200.00
	Per Ton of Yield				350.00
	Per Own Labour Day				120.00
	Per Cash Cost				1.75

Table 17 *Gross margin of* ***conventional sour cherry*** *production in 1 ha area*

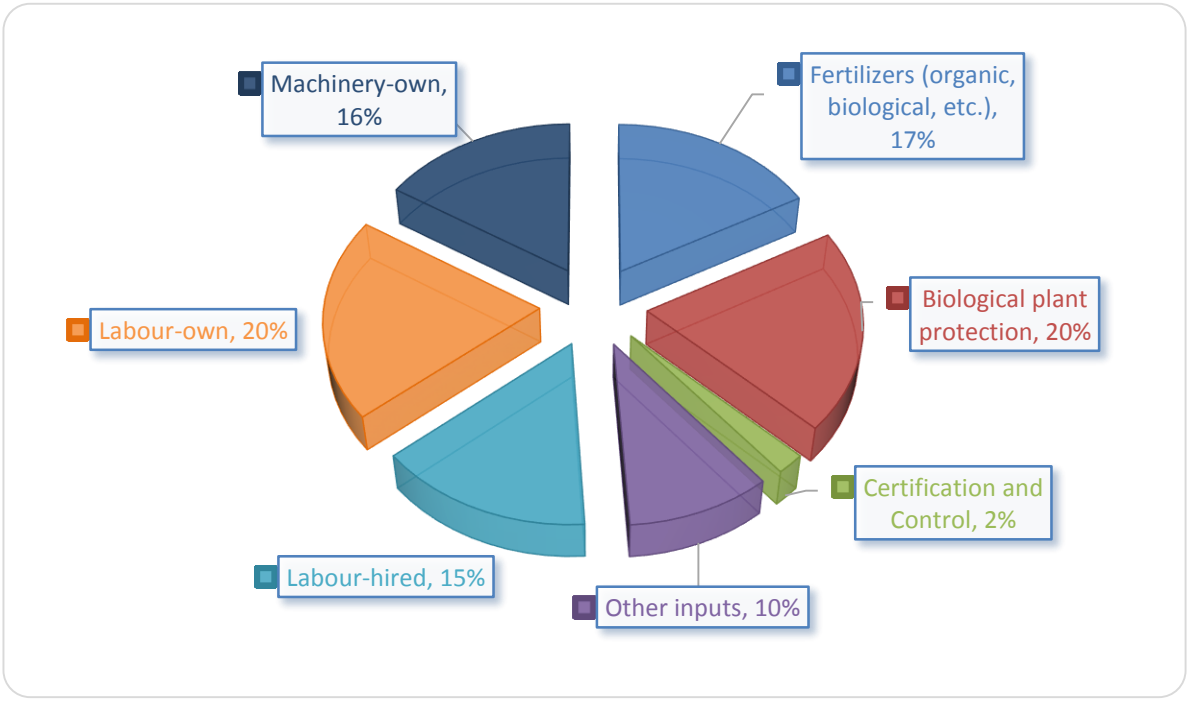
	ECONOMIC INDICATOR	**UNIT**	**QUANTITY**	**PRICE (EUR/UNIT)**	***TOTAL VALUE* (EUR)**
I	Gross income				
	- *Yield*	t	15.00	420.00	6,300.00
	Total (I):				
II	Variable costs				
	Fertilizers (total)				620.00
	Pesticides (total)				650.00
	Other inputs				248.00
	Machinery-own				712.00
	Labour		58	15.00	870.00
	Hired	day	15	15.00	225.00
	Own	day	43	15.00	645.00
	Total (II):				

	ECONOMIC INDICATOR	UNIT	QUANTITY	PRICE (EUR/UNIT)	*TOTAL VALUE* (EUR)
	Actual				3,100.00
	Actual minus imputed				2,455.00
III	Gross margin				
	Per Hectare				3,200.00
	Per Ton of Yield				213.33
	Per Own Labour Day				89.42
	Per Cash Cost				1.30

According to the opinion of fruit experts, production of fruit in the world is considered successful if a gross margin of over 2,000 EUR per hectare is realized.

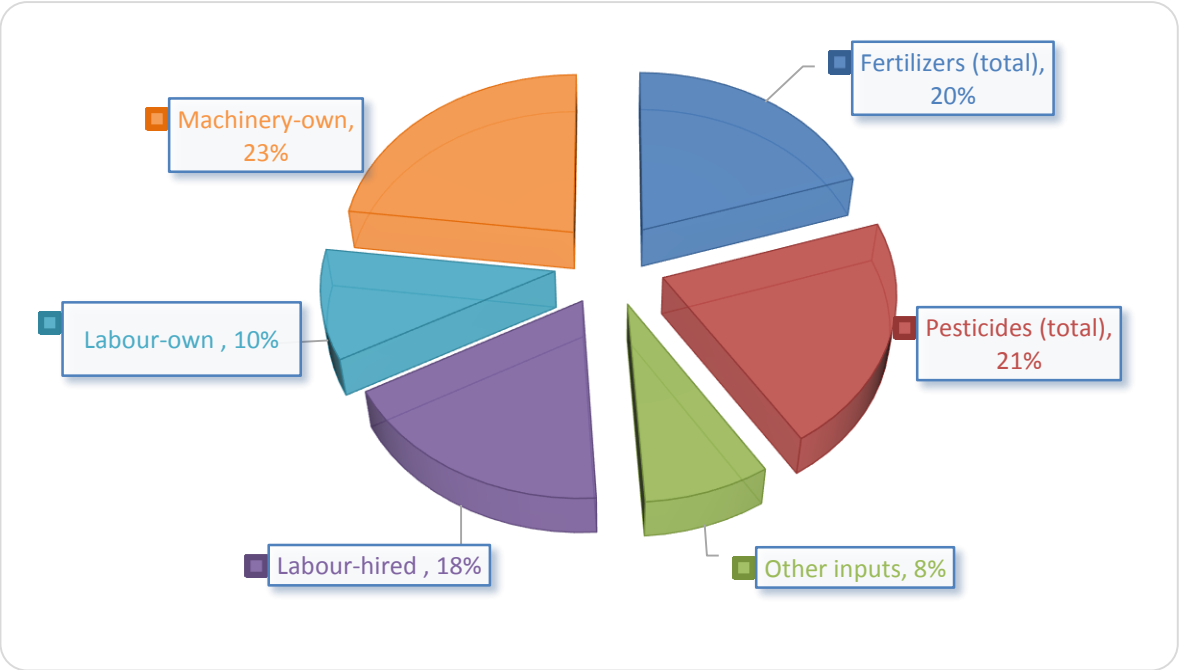
Figure 12 *Cost structure of production sour cherry in different ways*

- organic production -



- conventional production

-



Profitability of the organic sour cherry „oblačinska višnja“ is satisfactory as confirmed by data obtained during the previous period of organic production, positive economic effects were achieved, in the average amount of 1,000 EUR/ha more than in conventional production sour sherry. Structure of this calculations depend on the variety, growing system, planting density, technology, technical equipment, and intensity of cultivation, market factors, and others. Given that investment in cherry and plum crops is a long-term investment, it is necessary to conduct a proper analysis of the economic feasibility of investment, prior to their establishment.

Gross margins of production and processing of organic plum

Plum producers in the system of organic production can realize a gross margin per hectare amounting to about 3,780 EUR (Table 18). However, better profitability in the production of plum can be achieved by her finishing and processing. The ultimate profit from processing, minus the cost of processing, is almost three times more than the profit achieved by the realization of the raw cherries and plums from primary production.

Table 18 *Gross margin of* ***organic plum production*** *in 1 ha area*

	ECONOMIC INDICATOR	**UNIT**	**QUANTITY**	**PRICE (EUR/UNIT)**	***TOTAL VALUE* (EUR)**
I	Gross income				
	- *Yyield*	t	16.00	380.00	6,080.00
	Total (I):				
II	Variable costs				
	Fertilizers (organic, biological, etc.)				415.00
	Biological plant protection				555.00
	Certification and Control (50%)				45.00
	Other inputs				250.00
	Machinery-own				345.00
	Labour		46	15.00	690.00

	ECONOMIC INDICATOR	UNIT	QUANTITY	PRICE (EUR/UNIT)	*TOTAL VALUE* (EUR)
	Hired	day	16	15.00	240.00
	Own	day	30	15.00	450.00
	Total (II):				
	Actual				2,300.00
	Actual minus imputed				1,850.00
III	Gross margin				
	Per Hectare				3.780.00
	Per Ton of Yield				236.25
	Per Own Labour Day				141.00
	Per Cash Cost				2.04

According to the average amounts of input-output parameters in the region, the average investment into establishment of plum crops ranged from 7,000 to 9,000 EUR/ha (land preparation and planting, so-called "zero" year and five years of management during the growing period), and for the cherry crop, this investment ranges 5,500 to 7,000 EUR/ha (Sredojević, 2011). Return on invested capital into establishment of sour cherry „oblačinska višnja“ orchards on average, with stable market conditions, is achieved in the second or third year of full production (i.e. fifth or sixth year after planting). If the placement of product is certain for more of year, and sales (purchase) price of the product acceptable (i.e. above the cost price), establishment of the crop is economically justified.

The total investment in the establishment of cherry and plum crops is the sum of all investment plus a certain amount of compound interest by years of growing and calculated at the end of the period of establishment, i.e. at the beginning of the exploitation of the established crop. These investments include: the cost of the machinery utilization, the cost of seedlings and other inputs, payment of workers, construction of buildings and roads, building fences, etc., depending on the intensity and growing system.

Also, so-called profit generated from the "small fruit" is deducted from the total investment in the last years of growing. It should be noted that, in addition to the above factors, the amount, the structure of investments and the value of certain parameters are influenced by: financing sources (own or borrowed capital, or a combination, which is a common and inexpensive option), interest rate, repayment period etc. Therefore, a special feasibility study is always prepared when crops are established. Also, it is important that each producer has its own accounting records and plans production on the basis of the available production capacity and own input and output parameters.

Figure 13 *Cost structure of production organic plum*

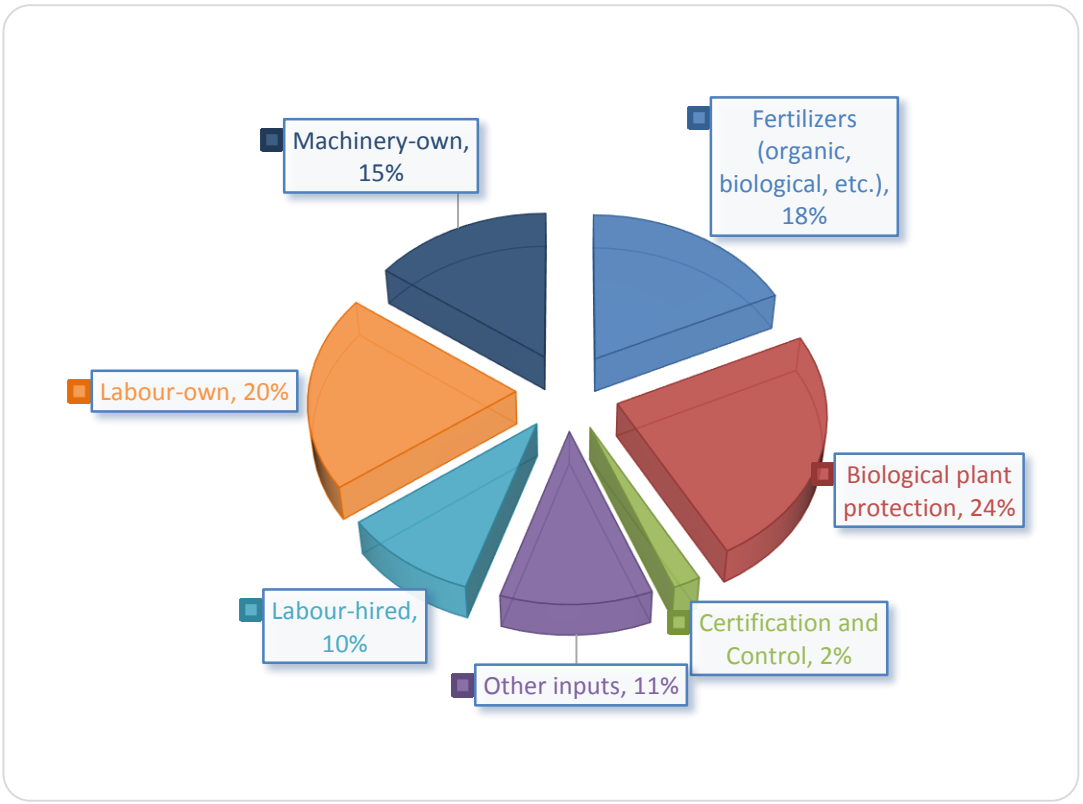
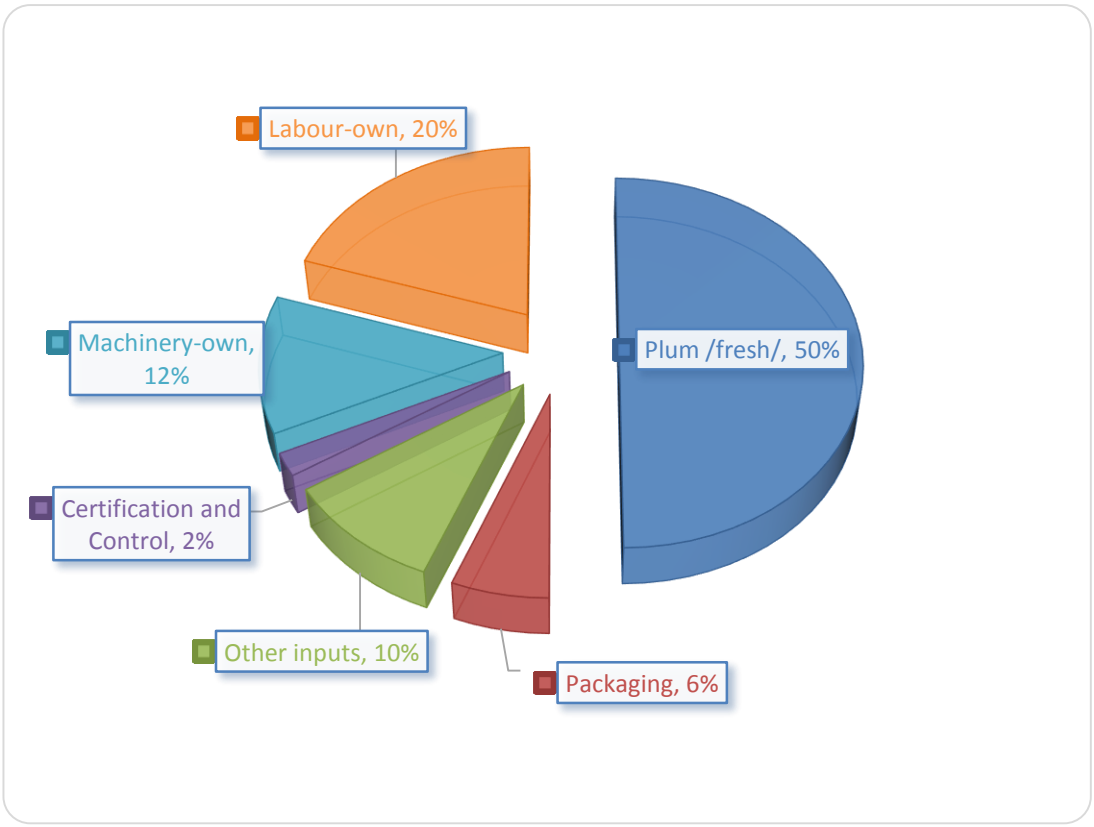


Figure 14 *Cost structure of processing organic plum*



In agricultural practice, a number of producers in Serbia, on their own holdings perform processing of fresh plum drying. The technology of organic plum was similar to the conventional (Table 19). Drying of the organic plums receives almost four times higher its selling price and thus value added.

In all analyzed plant production for particular region, based on the indicators established in the calculations and empirical data from practice, confirms the fact that the business is more profitable than conventional. More profit is achieved and per unit of per unit of area and yield. However, these are indicators for smaller surfaces and for products that they proved to be suitable for organic farming in these areas. For larger areas, would increase the demand for and the way a lot of expensive inputs (bio-fertilizers, plant protection, etc.). Higher demand for inputs, contributed to the growth of their retail price, which would have a negative impact on business in the production of organic.

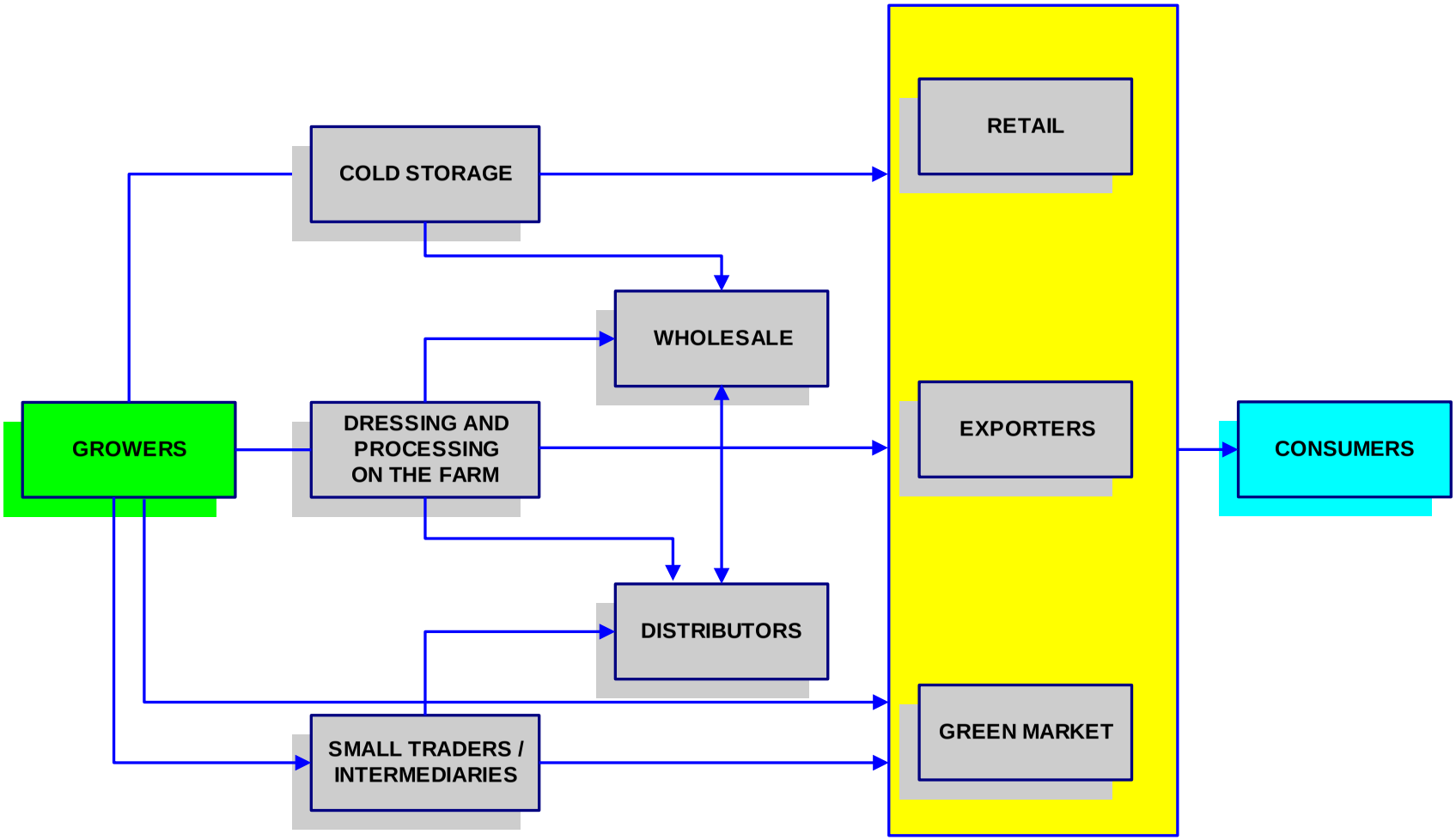
Table 19 *Gross margin of* ***processing organic plum*** *per one tone*

	ECONOMIC INDICATOR	**UNIT**	**QUANTITY**	**PRICE (EUR/UNIT)**	***TOTAL VALUE* (EUR)**
I	Gross income				
	- dried plum	kg	300	8.00	2,400.00
	Total (I):				
II	Variable costs				
	Plum /fresh/	kg	1,000	0.32	320.00
	Packaging				38.00
	Other inputs				64.00
	Certification and Control (50%)*)				13.00
	Machinery-own				77.00
	Labour-own				128.00
	Total (II):				640.00
III	Gross margin				1,760.00

On the other hand, the small scale of production in organic production, in the long run does not provide the quantity and continuity will meet the needs of customers. Processing products from primary organic production is achieved from two to four or more times the profit per unit of yield. So we can safely say that the value chain of organic products, the best economic benefit achieved in their processing. In this way, come to the fore value added organic products.

In addition to producers, processors, an important role in the value chain have distributors, wholesalers, retail shops, markets and others. Schematic view the value chain of sour cherry and plum can be seen in the figure 15, as a representative organic fruits of southern Serbia.

Figure 15 *Scheme of the value chain of organic sour cherries and plums*



5.4. The value chain of organic products from breeding of livestock specific to the region of South-Eastern Serbia

The border region of South-eastern Serbia comprises the territory of the nine municipalities along the borders with Bulgaria and Macedonia. These municipalities belong to three districts, namely: Pirot (municipalities of Pirot, Dimitrovgrad and Babušnica), Jablanica (municipality of Crna Trava) and Pčinja (Surdulica, Bosilegrad, Trgovište, Bujanovac and Preševo). The border area defined in this way covers an area of 4,850 km2 or 5.5% of the total territory of the Republic of Serbia. Based on various economic indicators, these municipalities represent the least developed region of Serbia. This is confirmed by the fact that the region of the Southern and Eastern Serbia accounts for only 14% in the structure of the GDP of the Republic of Serbia, while the Belgrade region has a far greater share, 40%. The region of Vojvodina accounts for 26% and the region of Šumadija and Western Serbia 20%.

Agricultural production in the region of South East Serbia is mainly extensive. Due to lack of manpower, livestock production has been in the decline for decades in Serbia. A small number of livestock, as well as low productivity caused by extensive nutrition, poor animal husbandry and poor breed structure, are problems encountered in 80% of villages in the region. Insufficient, out-dated production of fodder in the mountainous parts of the region is one of the key obstacles to intensification of livestock production, although production of perennial legumes (red clover, alfalfa) and making hay from natural meadows is the basis of crop production in the region. Facilities for rearing of livestock, especially cattle, do not meet basic zoo-hygienic conditions.

According to data from the Ministry of Agriculture, Forestry and Water Management, from 2013, in Serbia, 2176 head of cattle, 4,031 sheep, 946 goats, 175 pigs, 210 horses, 21 donkeys, 1,390 poultry, 1,940 beehives and carp, few hundreds, are reared in the organic production system. South Eastern Serbia has favourable conditions for the development of sheep, goat, cattle and poultry production.

The above mentioned types of production can be carried out in accordance with natural and biological systems of sustainable production and meet all environmental principles, as well as to meet the current requirements for animal welfare. Primary products are: cow, sheep and goat milk, particularly dairy products, as well as sheep, goat and beef meat. Extensive production systems and general conditions provide opportunities for the production of mentioned primary products with ecological values. Despite many problems, in terms of organic livestock production in Serbia, this region is dominant in this regard.

Based on the information gathered through interviews with farmers in organic livestock conditions, further on, the general information about the available agricultural land, the type and number of livestock for a representative family farm in the South East Serbia are presented.

- Sergej Ivanov from Dimitrovgrad – has 65 ha of agricultural land, and the following species of farm animals in the system of organic production: sheep, goats, horses and donkeys. Sheep farm has two production lines and 200 animals for milk production, and 40 for meat production. In addition to sheep/ewes, in milk production, he rears 20 goats. The final product in rearing donkeys is specific quality milk. Horses are reared organically, but other than actual financial support from the state, no financial income from breeding horses was realized. Organic livestock farming is the main activity of this farm, and as a supplementary activity, the owner develops agro-tourism, etc.

- Nikolić Milutin from Dimitrovgrad – has 210 ha of agricultural land, and the following species of farm animals in the system of organic production: 200 cows, their progeny is left on the farm and used for fattening, and final product are fattened young bulls. So, the farm is focused on organic livestock production for meat.
- Pejićev Emil from Bosilegrad – has 33 ha of agricultural land, and the following species of farm animals in the system of organic production: 200 sheep, 50 goats, 20 cows, five horses and one donkey. Milk from ewes and goats is sold as product of organic origin. Organic livestock farming is the main activity/operation on the farm. This is specific farm in this region, because animals are of native/autochthonous breeds.
- Kostadinović Slavoljub from Pirot – has 8 ha of agricultural land and rears in organic conditions 50 heads of pigs, Mangalitsa breed. This is additional activity on the farm, and the main source of income comes from sheep, goats and horses reared in conventional conditions.
- Momčilov Miodrag from Dimitrovgrad – has 55 ha of agricultural land in ownership, and 5 ha taken on lease, and rears in organic conditions 8 cows and 12 horses. This species of livestock is intended for meat production of organic origin. Also, sheep are reared in organic conditions grown, and as a final product cheese made on their own farms is sold on the market.
- Stojanović Predrag from Dimitrovgrad – has 10.5 ha in the Stara Planina Mountain reserve. He rears on the farm 75 sheep/ewes, five goats and a donkey. Milk products and processed into cheese. This farm is specific in that it is certified for the production of organic cheese. In addition to this production, on smaller surfaces he produces potato, plum and apple, also in organic conditions.
- Nikolov Novica from Dimitrovgrad – has 22 ha of agricultural land. In the system of organic livestock production, 80 sheep/ewes are reared for production of milk, which is processed into cheese, as the final product. This is the main activity on the farm. In addition to the sheep, 20 horses are reared on the farm.
- Nikolov Dragan from Dimitrovgrad – on leased agricultural area of 55 ha, the main business/activity is the farm with 150 cows reared in conventional conditions. In the organic system of production, 27 horses are kept on the farm, as additional activity.

The farms that have been analysed also have developed poultry production, which mainly serves to meet the needs in their own homes. Here the emphasis is on dairy and sheep production. Livestock production/Animal husbandry has multiple significance and leading role since it provides a basis for the development of a substantial part of the processing industry. In addition to production of high-value energy and caloric feed, it requires the employment of the labour force during the year. It is considered as one of the most labour intensive activities and it represents the main source of household income on the analysed family farms. In mountainous areas, such as the South East Serbia, it is practically the only economically viable use of land and an important condition for the demographic coverage of the area.

There is an association for organic production "Biobalkan" in the region, and the cooperative "Argbinje" which link and connect producers to achieve common interests. Often various educational trainings, extension, etc., are organized. In addition to the associations and connections in the region, producers are members of the association Serbia Organika and other associations. Through horizontal and vertical connections, cattle breeders are well informed and follow the latest trends in organic farming.

5.4.1. ORGANIC LIVESTOCK BREEDING SPECIFIC FOR THE REGION

The cow-calf system is an extensive system of meat production based on grazing cows and calves, which are still sucking during the pasture season. Cows nurse calves in a shortened lactation, from 6 to 9 months of age. The intensity of growth is influenced by the genotype, milk performance of the dam-mother, her maternal traits, sex/gender of the calf (male calves are heavier at birth and have a higher intensity of growth), calving season (the highest gains are recorded in calves born in early spring), order of calving and creep feeding. Weaning calves is done according to the calving season. In case of the seasonal pasture, weaning is carried out in the fall after the end of grazing. Calves born in winter are weaned with 8 to 10 months of age, and calves born later are weaned younger.

Feed is the most important factor in organic farming. For livestock feed are used that are produced organically. In region of Eastern Serbia feed provided by the surface owner of the farm. In both organic and conventional livestock farming, in the cost structure, the dominantly place has the costs of feed, about 60%. For breeders of cattle are economic interests in a favorable selling price of milk and animals for meat.

Fattening cattle on farms that organize organic livestock production is based primarily on the exploitation of pastures. Fattening cattle on pastures reduces the dependence of feeding beef cattle concentrated feed, reducing feed costs. This system of breeding and feeding of beef cattle provides a fuller use of natural resources. The same areas are used for other livestock species: cattle, sheep and goats. In the nutrition of young cattle (young bulls and heifers), at least 60% of dry matter in their daily diet consists of fresh or dried roughage or silage. This is especially important in conditions when concentrated nutrients are purchased on the market, because the supply of the certified organic nutrients is often a significant problem.

Breeding sheep is organized on similar principles as in cattle. Grazing systems are similar to those in cattle production. Sheep as ruminant animals very efficiently perform the conversion of cellulose rich plant nutrients in high-value products. The production of meat, milk, and wool is very cost-effective, given that the investments are lower, and products highly valued and appreciated/sought after in the market.

Sheep are very low-maintenance animals. In the summer period, their diet is based on grazing, while in the winter it is fodder with the addition of concentrated feed. The sources of energy commonly used as concentrated feeds are corn, oats, and barley, produced organically. The requirements of sheep in nutrients depend on several factors: body weight and body condition, stage of production, physiological status, activities, age, etc.

5.4.2. PROVIDING INPUTS

Livestock breeding in the region and the organization of the farm is quite extensive. Farm owners usually have larger agricultural areas or partially take agricultural areas on lease. Structure of the area is mainly focused and directed towards the production of feed for livestock. In summer, the cattle are grazing on pastures and mountain meadows. During the summer season, cattle breeders collect hay from the mountain pastures for livestock feed during the winter. As a concentrated feed, barley and oats are cultivated on arable land. Available nutrients, which are produced on farms in this area, are often low in protein and sometimes insufficient for the winter period, and cattle breeders buy additional nutrients that are produced in other regions. This increases the cost of production of livestock, as these nutrients are often expensive and accompanies by high transport costs. Therefore, breeders are often in a dilemma whether to sell a certain number of animals or to purchase food. It is important to point out that the manure from own farms is used

for fertilization of the arable land. In terms of inputs and outputs, a high degree of rounded organic system of production has been achieved on these farms.

5.4.3. PRODUCTION LEVEL

Milking cows and sheep/ewes on farms is done mostly by hand with the involvement of family members, and sometimes seasonal workers hired for the summer season. Some owners have milking machines and achieve better productivity in milking. The volume (quantity) of milk produced on farms in terms of organic production is in accordance with corresponding averages specific to species of livestock and breed of animals, also in the conventional production in this region. Only several producers are selling milk, and most of them are processing milk on the farm.

Price of fresh cow's milk from the throat of the conventional breeding, during period 2009-2013 is not very varied and ranged from 0.23 to 0.29 EUR/liter. Price calves for slaughter fluctuated in the interval from 2.59 to 2.63 EUR/kg, heifers for slaughter 1.89 to 1.94 EUR/kg and lambs from 1.98 to 2.05 EUR/kg. However, in comparison to conventional production, producer prices of milk from organic breeding livestock, were 25-35% more and the selling price to the even 30-50% more, organic heifers for slaughter about 40-50% and lamb 30-40% more than from the conventional breeding.

5.4.4. PROCESSING

The cheese is main dairy product produced in this region. Processing is carried out by the farmers or family members with the use of known traditional methods, and the process is extensive and requires considerable engagement of the workforce. One farmer has a certificate for the production of organic cheese and has success in selling of products at lower prices. Other producers sell final products, milk or cheese, as products derived from cattle that are grown in organic conditions. Milk and dairy products can obtain a higher price by 40% compared to the same products obtained from conventionally produced livestock. Fattening cattle used for production of meat are sold to owners of slaughterhouses and to a lesser extent, to restaurants. They achieve better price compared to cattle bred in conventional conditions, but not to the extent that they could achieve if certified for organic meat. Even though this is opportunity lost for them, they are not in a financial position to invest in the capacities to produce organic meat on their farms. Such an investment would be profitable at the regional level, for all producers of organic meat.

5.4.5. DISTRIBUTION

Final products produced on these farms, are sold directly to customers on the farm or to cooperative "Arbinje" that operates in the region. Some producers have contracts with school kitchens or restaurants, as well as slaughterhouses in the region and supply their products to them. The participants in the value chain of product origin of organic livestock farming in this region can be shown in the figure 18. Also, they manage to sell their products through chain stores "Zdrava hrana" (Healthy food), as well as in accordance with the development of agro-tourism in the region.

5.4.6. COST-BENEFIT ANALYSIS

Comparative analysis of gross margins of organic cattle breeding

In the table 20 is calculated gross margin of organic keeping dairy cows. Structure of gross income consists of the value of the main products of one production cycle: milk, calf and excreted throat. To this was added and the amount of incentives for the cow. The value of manure is not included, but it is used for fertilizing owner arable area livestock breeder.

Table 20 *Gross margin of* ***milk production per dairy cow in organic breeding*** *per annual*

ECONOMIC INDICATOR		UNIT	QUANTITY	COEFFI-CIENT	PRICE (EUR/UNIT)	TOTAL VALUE (EUR)
I	Gross income					
	Milk	kg	5,500.00	1.00	0.36	1,980.00
	Calf	kg	180.00	0.76	3.08	415.00
	Culled cow	kg	630.00	0.17	0.98	105.00
	Manure	t	8.4	-	-	-
	Subsidy for cow	-				120.00
Total (I):					2,620.00	
II	Variable costs					
	Purchased feed					85,00
	Own feed					685.00
	Veterinary expenses					40.00
	Certification and Control (50%)					75.00
	Other inputs					90.00
	Machinery-own					95.00
	Labour-own					220.00
	Total (II):					1,290.00
III	Gross margin					1,330.00

**) The calculation relates to the typical production in conditions of organic production in region South-Eastern Serbia*

Gross margin per dairy cow in organic breeding is 1.330 EUR per year. Conventional breeding of cattle in eastern Serbia is quite extensively. Therefore, small differences in input prices between organic and conventional farming, additional items in the cost of organic farming are the costs of certification and control, which amounts to 50% refunded as a way of supporting MPZŽS.

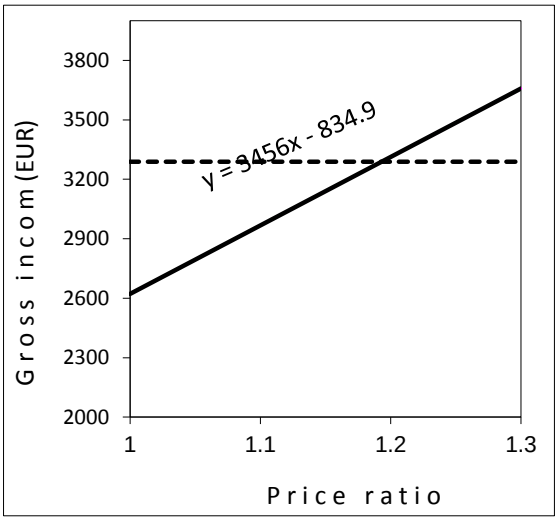
As for the final of products in organic production, we get to the same extent as in conventional terms, but better quality and therefore achieve significantly better selling prices. So here are given only calculations in terms of organic production, and the difference in the selling price of the final product compared to conventional production, can be read on the graph (Figure 16).

To ensure the same number of cattle on the farm as in conventional conditions required larger arable surfaces. It is known that in organic farming conditions obtain lower yields and this is directly reflected in the number of head of cattle feeding on the farm (Sconhoft, 2008). With higher costs around food security, here is a graph presented a comparative analysis of the price of the final product for the same number of animals for a different way of growing on farms (Sredojević et al., 2010).

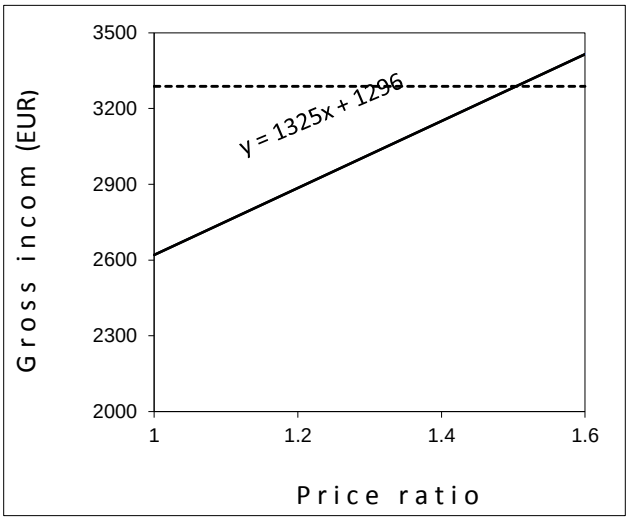
On the figure 16 on the x-axis are presented refers to the price for the milk (left figure) and price for the meat (right figure). On the y-axis is represented by the gross income of the throat reared in different production conditions. Prices and gross income in conventional conditions are taken as fixed size. The dashed line represents the gross income in conventional breeding, a full line gross income in organic farming. At the intersection of solid and dashed lines is seen to be equal to gross income in conventional and organic farming is achieved in relation to the price of milk 1: 1.2 i.e. at a higher milk price by 20% in organic production (Sredojević et al., 2014).

Figure 16 *The ratios of the prices of milk and prices of meat in different ways production in which achieve the same gross income*

(price milk in conventional way = 1)



(price meat in conventional way = 1)



Budget for meat is 1: 1.50 i.e. 50% more expensive meat of animals from organic. However, in practice, the milk producers achieve up to 30% higher price, and the meat hard to get up to 55%. That is why they are often forced to animals for meat, grown in organic conditions sale as from conventional breeding. In addition to the profit motive for organic farming cattle for producers is the possibility of rational exploitation of areas that are not suitable for intensive production.

Calculation gross margin per head for meat in organic farming amounts 570 EUR (Table 21). Structure of production costs is similar to that of keeping cows, which make up the largest share of food costs accounted for about 57% and all other costs account for less than 43% (cost of feed, certification and control, labour, machinery etc.)

Table 21 *Gross margin per head of* ***organic breeding cattle*** *for meat*

ECONOMIC INDICATOR		**UNIT**	**QUANTITY**	**COEFFI-CIENT**	**PRICE (EUR/UNIT)**	***TOTAL VALUE* (EUR)**
I	Gross income					
	Fattening animal	kg	250.00	0.95	3.20	760.00
	Culled cow	kg	600.00	0.15	1.00	90.00
	Subsidy for cow	-				180.00
Total (I):					1,030.00	
II	Variable costs					
	Purchased feed					35.00
	Own feed					225.00
	Veterinary expenses					10.00
	Certification and Control (50%)					60.00
	Other inputs					20.00
	Machinery-own					50.00
	Labour-own					60.00
	Total (II):					460.00
III	Gross margin					570.00

**) The calculation relates to the typical production in conditions of organic production in region South-Eastern Serbia*

Gross margin of organic production of sheep meat and milk

Unlike the growing of cattle, sheep are more suitable for organic farming. They require less food, along with the quality of meat and milk, provide wool and fertilizer. In table 22 are given some important parameters for a farm of 100 sheep.

Table 22 *Production results achieved in a system of* ***organic breeding of 100 registered ewes***

PARAMETER	RESULT
Milk production, annual	15,000 kg or around 2,000 kg cheese
Wool production, annual	350-400 kg
Number of lambs, annual	120-130 animals
Mortality	2%
Flock replacement	20%
Number of slaughter lambs	105-115 animals or 3,500-4,500 kg of lamb meat
Lamb slaughter weight	35-40 kg
Lamb weight at birth	3.7-4.2 kg

In Eastern Serbia have a few sheep farmers of different size farms. On the basis of natural input and output parameters appropriate price in table 23 a comparative analysis of economic indicators of organic sheep breeding farm for two different numbers of sheep.

Table 23 *Gross margin of* ***organic production of sheep meat and milk****, per annual*

ECONOMIC INDICATOR		**EUR/FLOCK SIZE**	
		120 ***head of sheep***	250 ***head of sheep***
I	Gross income		
	Lambs	14,580.00	30,550.00
	Milk	5,575.00	14,028.00
	Culled ewes	1,670.00	3,497.00
	Wool	67.00	130.00
	State subsidies	2,098.00	4,370.00
	Total (I):	25.990,00	52,575.00
II	**Variable costs**		
	Purchased feed	670.00	1,100.00
	Own feed	7,359.00	15,010.00
	Veterinary services	471.00	980.00
	Rearing expenses	508.00	910.00
	Certification and Control (50%)	1,130.00	1,625.00
	Machinery-own	180.00	240.00
	Labour-own	320.00	360.00
	Other expenses	147.00	210.00
	Total (II):	10,785.00	20,435.00
III	Gross margin	15,205.00	32,140.00

**) Calculation is made for flocks in organic conditions intended for the production of meat and milk*

For a farm of 120 sheep achieved gross margin about 15,205.00 EUR and for a farm of 250 sheep gets the gross margin about 32,140.00 EUR per year. This means that the per head sheep gross margin ranges from 127-130 EUR per year.

Gross margin of processing organic milk

For larger farms, achieved cost savings, because the gross margin per head sheep a little higher compared to smaller farms. In this region, the milk of sheep, mainly, on farms processed into claims cottage cheese. So the cheese obtained from milk of sheep from organic farming, receives gross margin about 70 EUR for 10 kg, respectively 7.00 EUR/kg (Table 24).

Processing milk into cheese gets 5 to 7 time larger economic impact of the product. Certified organic cheese, with appropriate packaging and design, can reach a higher added value. Unfortunately, in this region, only one grower has been certified for milk processing.

Table 24 *Gross margin per 10 kg* ***cheese from processing of organic milk***

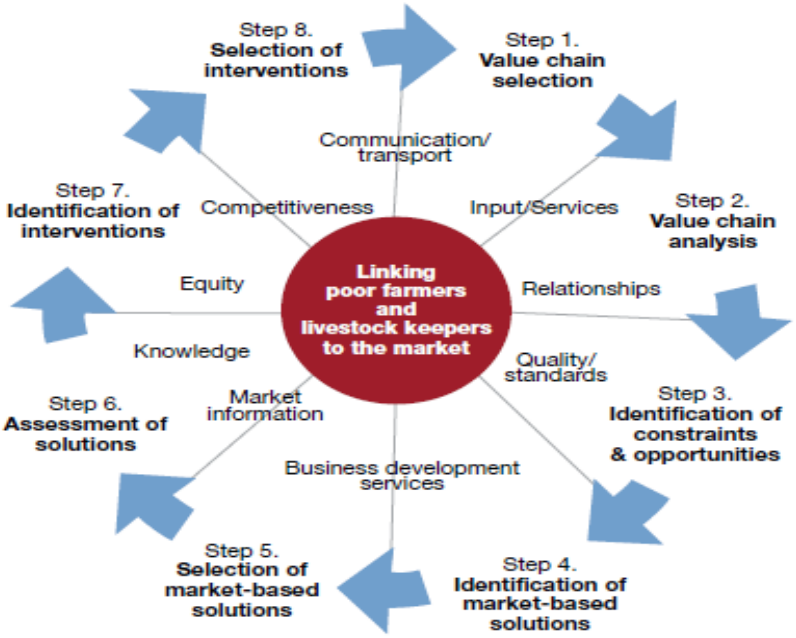
	ECONOMIC INDICATOR	**UNIT**	**QUANTITY**	**PRICE (EUR/UNIT)**	***TOTAL VALUE* (EUR)**
I	Gross income				
	Cheese - claims cottage	kg	10.00	8.00	80.00
	Whey	l	65.00	0.06	3.90
	Total (I):				83.90
II	Variable costs				
	Milk /fresh/	l	70.00	0,26	12.00
	Packaging				0.70
	Other inputs				0.50
	Certification and Control (50%)*)				0.70
	Machinery-own				0.20
	Labour-own				0.50
	Total (II):				14.60
III	Gross margin				69.30

Some of the main issues raised by the analysis of organic milk in this region are the following:

- Producers are the weakest actors in the milk supply chain, with the lowest bargaining power and the smallest economic benefit. They lack transport means to access urban markets directly, have poor-quality breeds and feeding concentrates, and complain of the high cost of veterinary services.
- Strengthening the role of dairy producers with lowest milk production in the milk marketing sector, allowing them to produce more, improve quality, lower costs, and thereby gain higher bargaining power, will have positive effects on their livelihoods and on their access to productive and social services.
- Producers with lowest quantity milk are organized in village - based micro association which gives them: higher bargaining power, due to the much higher quantity of milk they can control; a safety net in case of drought, overgrazing or sudden livestock diseases; improved knowledge in livestock husbandry and hygienic milk production; and peace-building mechanisms in the case of disputes among different producers.

The producers with small quantity of organic milk production at certain stages are connecting for easier sell milk. This value chain It is schematically shown through 8 steps. It is schematically shown through 8 steps (Figure 17).

Figure 17 *Value chain analysis and farmers with lowest production of milk in region*



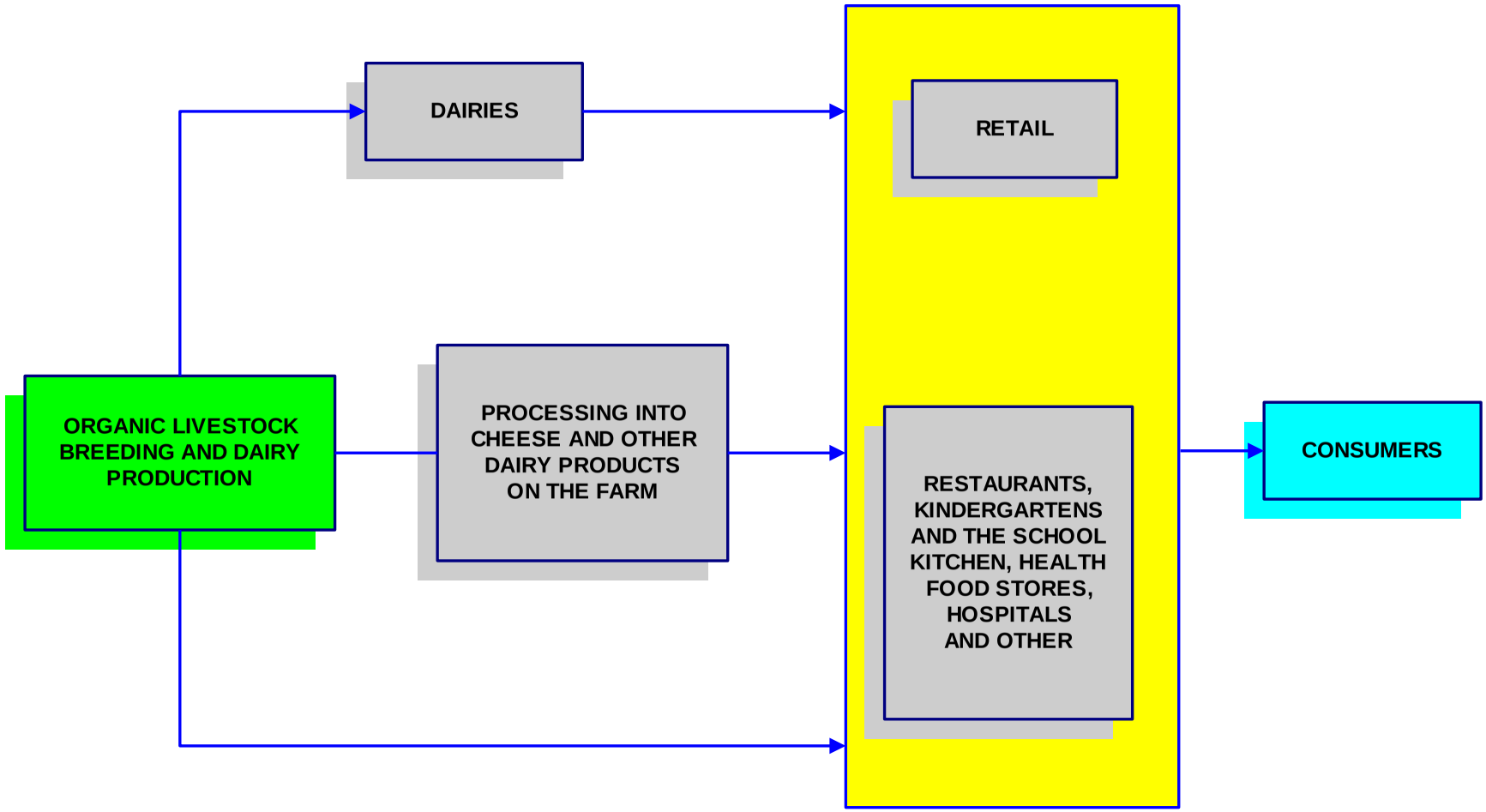
Source: According to www.ifad.org/lrkm/index.htm International Fund for Agricultural Development (IFAD, Antonio Rota, 2010)

For smallholders, meeting the certification requirements and production quality standards of the market for organic food are extremely demanding, especially for the marketing of organic meat and dairy products. However, by working with natural processes and making use of locally available assets, smallholder farmers in Serbia can increase the productivity of their farms and avoid dependence on expensive external inputs.

The main limiting factors are costs and risks in converting from conventional to organic livestock production; training and knowledge to meet organic certification requirements; access to certification procedures; and good management skills for animal nutrition and disease control. The growing markets for certified organic meat, eggs and dairy products offer important income opportunities, but still remain extremely demanding. Achieving and maintaining the critical quality requirements of the major markets represent a significant constraint for development of rural areas.

Value chains of milk and meat from organic livestock breeding region of Eastern Serbia are illustrated schematically in the figures 18 and 19.

Figure 18 *Scheme of the value chain of milk from organic livestock breeding*



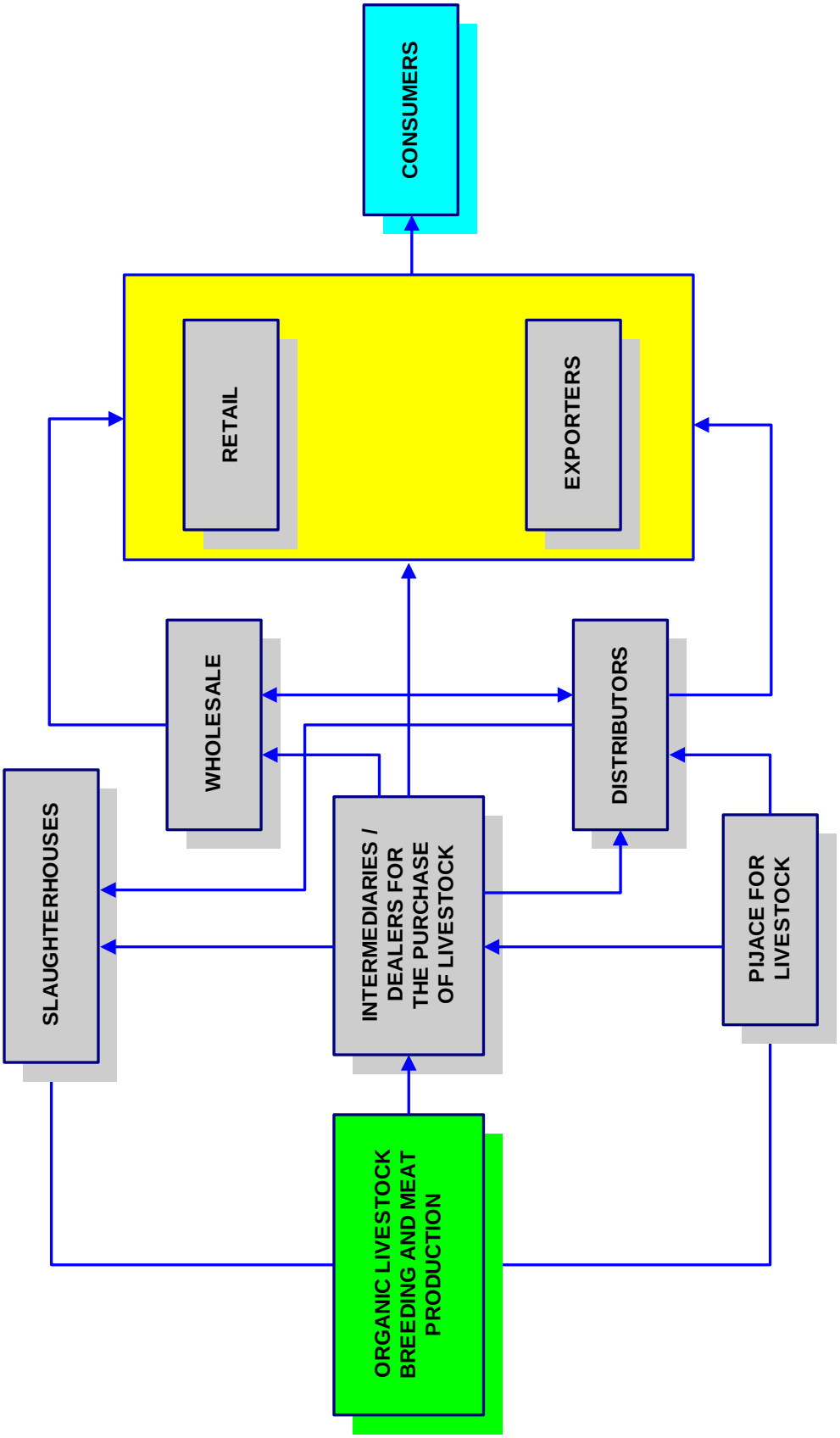


Figure 19 *Scheme of the value chain of meat from organic livestock breeding*

6. RECOMMENDATIONS AND PRIORITES FOR IMPROVING EFFICIENCY AND COMPETITIVENESS OF SELECTED OFP VALUE CHAIN

6.1. SWOT analysis

This SWOT analysis reflects the Strengths, Weaknesses, Opportunities and Threats identified through analysis of the value chain of organic products specific to certain regions and Serbia.

STRENGTHS

Political

- Organic production sector is gaining in importance and priority within national strategies and programs Serbia.

Economic

- Favorable agro-climate conditions for growing organic products
- Preserved greater number of indigenous plant varieties and livestock breeds
- The interest of producers to increase the area under organic production

Social

- The interest of young people about the cultivation of organic products
- Achieving significant economic benefits and revitalization of rural areas

Technological

- Production of biologically valuable and quality products
- A number of companies have developed programs for processing organic products

Ecological

- Biodiversity and Environment suitable for organic production
- Organic farming contributes to the conservation of natural resources

Law

- National legislation in organic production is in line with EU regulations

WEAKNESSES

Political

- There is no single record of the production, processing and marketing of organic products
- Insufficient control on the market for organic products (imports and domestic production)
- Insufficient control certification bodies

- Weak organization of competent advisory services for the sector of organic production

Economic

- High input costs and consequently high production costs per unit of product
- A large number of small producers, with a series of small parcels, quite distant from each other, which reduces the profitability of production
- Some labor-intensive production requires significant involvement of the workforce, which used to be a problem in rural areas
- The high cost of warehousing and storage of organic products to maintain quality
- Unsatisfactory knowledge in management and marketing
- Lack of organized production, processing and distribution of organic products
- Lack of horizontal and vertical links in the chain of organic products
- A lot of products sold in bulk, which reduces their value
- Dominating the sale of products from primary production, a higher added value obtained in their processing
- Inadequate quality control of products placed on the market
- Weak association of producers in the sector of organic production
- Due to the poor organization of the organic sector, many producers will in future give up on organic production

Social

- In rural areas dominated by elderly households, with insufficient inflow of the working age population and low attractiveness of Agriculture
- Not enough confidence of farmers in the state institutions and incentives for organic production

Technological

- Insufficient investment in capacity for processing organic products
- A larger number of producers and technology adopted in addition to the primary production of organic products, there is a clear development plan for the processing, packaging, storage and marketing of products
- The lack of accredited laboratories for quality control and unprofessional performed physical and chemical testing of organic products creates a distorted picture of their origin and quality
- In regions with high potential for organic livestock farming, there is no accredited dairies and butchers for milk and meat organic origin

Ecological

- Insufficient control of waste water and other harmful substances in the vicinity of the organic farm
- Insufficient support in the use of indigenous varieties and breeds

Law

- Inadequate enforcement of ordinances to control organic production - biological

plant protection products, organic fertilizers and other organic inputs for top feeding etc. are not sufficiently under the control of professionals and experts.

OPPORTUNITIES

Political

- Providing a larger amount of incentives to support the development of organic production of large amounts of financial resources within rural development
- Better connection between the participants in the value chain will lead to greater added value of organic products
- Protection of domestic organic production and branding of organic products
- The recognition of the specific role of the sector of organic production in the sustainable use of natural resources
- Support accreditation body Serbia in order to comply with the requirements for accreditation in the field of organic production and the guidelines for the export of organic products in the EU
- The inclusion of organic production in the IPARD program when the conditions prescribed by the EU regulations
- Preparing a comprehensive national action plan for organic farming in Serbia with clearly defined measures and indicators for their implementation

Economic

- In areas of growing organic products develop and rural tourism
- Diversification of organic producer and diverse product offering for tourists
- Potential increase in selling prices of organic products producers and motivation to achieve greater economic benefits
- The increase in value added organic products through, finishing, processing and marketing, quality and packaging design.
- Great export opportunities organic products

Social

- Applications for promotion and consumption of organic products, including health information

Technological

- The introduction of new technologies and education of producers and processors on the possibilities of increasing the quantity and quality of production and achieve quality, quantity and continuity
- Support laboratories for analysis in the field of organic production in accordance with international standards

Ecological

- Special incentives for organic production in protected areas designated in accordance with the law of conservation of natural resources
- Greater control and better use of the remains of plants and livestock farms to organic fertilization

Law

- Preparing a strong legal framework for the production, processing and quality control
- The simpler and shorter the payment of subsidies for organic production
- Preparing records of organic products - yields, prices, stocks, imports, exports and other important indicators
- Continuing work on the harmonization of the legal framework with EU requirements

THREATS

Political

- Insufficient support for certification processing capacities for organic products
- Insufficient support in integrating stakeholders along the vertical value chain of the organic sector
- Incentives for the period of conversion, partial reimbursement of the cost of certification, not the best solution in the long term for producers of organic products

Economic

- The decline in purchasing power and weak demand for organic products
- High investments in plantations and cattle breeding for organic and lack of support from the state
- Since there is no certified dairies and butchers and therefore not the existence of the final phase of the product of organic farming livestock producers are forced to sell their milk and animals for meat as conventional origin, so for all that abandon organic farming

Social

- Lack of manpower and young farmers because of the rural exodus
- A significant part of the population does not know the benefits of organic products, while one part of the population has no confidence about the origin of organic products

Ecological

- Lack of control of natural resources - land and water sources for organic production

Law

- Lack of respecting the standards and regulations are incomplete, may lead to corruption and other abuses in the sector of organic production

Performance evaluation

Organic products and post-harvest management

Based on the analysis of the overall analysis of the value chain of organic products, in order to improve the sector, special attention should be paid to the following disadvantages:

- Low productivity surfaces in combination with small and fragmented plots per farm provides a high cost per unit of yield
- A small proportion of land area under organic and slow adoption of new technologies, especially the deteriorating situation in the sector and further causes a large fluctuation from year to year
- Insufficient organization and the inability of producers to provide continuity in the market
  Lack of knowledge and practice of packaging and design of organic products, further reduces the profitability of the sector and the potential for positive impact on the environment.
- The underdevelopment of rural areas and particularly over the less suitable for life still causes demographic deficit and reducing the workforce.
- The progressive aging of the rural population and the lack of interest of the younger generations to exploit small areas because they are not sustainable economically.

Treatment and processing

Depending on the development of the region and the same types of production, there has been a different level of treatment and processing of organic products. In this respect, it is quite a high level of processing is achieved in organic vegetable production in the region of Vojvodina. Organic fruit in the regions of western and southern Serbia, producers lesser extent processed on their own farms - juices, jams, jams etc., and most owners surrender refrigerator.

Processing of livestock products from organic breeding systems in southeastern Serbia takes place at a very low level. A small number of cattle breeder milk is processed into cheese on the farm, but it difficult to implement at a higher price because they do not have certificates for processing capacities. These products are sold on the basis of such trust well-known customers. Also, not for meat from cattle from organic farming, there are no certified slaughterhouses. All this reduces the value of the products of organically grown cattle.

Distribution and Consumption

Direct selling is a very effective and guaranteed income and the producer and the buyer who eschew share profit with retailers. This strategy is further justified in cost that domestic producers have in marketing their products. For consumers of organic products, the benefit of direct purchase from a breeder can be a guarantor of the origin and quality of these products, and also a lower purchase price because of avoided costs of commercialization.

Some producers and processors of organic products sell their products to specialized shops "healthy food" restaurants in nurseries, kindergartens, schools and hospitals. Lack of association of producers is an additional factor that burdens channels for marketing organic products.

Consumption of high-quality organic produce threatens declining purchasing power of consumers. In addition, imports of cheap inputs and selling products under the sign of Serbian origin, can suppress domestic production of organic products.

Institutional Environment

In order to improve organic farming in Serbia is necessary:

- Strengthen sector through support centers, technical assistance and higher education in order to increase their managerial skills and marketing knowledge.
- Support professionals through training and favorable credit lines allow the purchase of equipment for the laboratories that perform testing and analysis in the field of organic production in accordance with international standards.
- Support the development of the Accreditation Body of Serbia that would have the authority to inspect, test, calibration, certification and the like. In the sector of organic production in accordance with EU standards.
- Continue work on the harmonization of the legal framework with the requirements of EU integration and Organic Agriculture IPARD (Instrument for Pre-Accession Assistance for Rural Development) when the requirements set by EU regulations.

Overall performance

Based on the analysis of the value chain of organic products, we can conclude that in the field of organic production needs a lot of improvement. Although the potential shifts can be identified at all stages of production to sales, the greatest effort should be in the horizontal and vertical integration of the connection of all participants in the value chain.

Although successfully operate individual farms and businesses, the lack of a shared vision leads to loss of economies of scale to huge differences in quality, lack of market information, as well as insufficient market position.

Actors sector should start to develop relations on existing good practice. This includes gathering around associations and cooperatives, as well as companies with strong brand to establish contractual arrangements and quality criteria to support its marketing strategy. The competent authorities sometimes play a key supporting role in the case of initiatives and promotional events.

Government policy has come to support these initiatives and be part of the effort in the development of the sector, through involvement in the value chain stakeholders in areas such as management, marketing, environmental dimension, other certificates, quality and quality.

6.2. TOWS analysis

TOWS matrix is used here for identification of the main intervention axes in organic sector. In the annex are synthesized data of the TOWS matrix consisted according to the identified strenghts, weakneses, oportunities and threats from the SWOT analysis.

Table 25 *TOWS matrix of the value chain analysis of region specific organic products in Serbia*)*

SO Policies Strengthening of the organic production Harmonize legislative with the EU requests Integrate organic production in other strategies of the Ministry of Agriculture **Harmonization of the operative system of control and certification with the EU standards** Harmonize work of the authorized control organizations with the EU requests Regularly update data base with the changes and additions to EU standards **Extension services in organic production** Develop specific criteria for advisors selection **Research and development in field of organic production and processing** Develop common study programs and staff education with universities and research institutions in EU (Kassek, FIBL, etc) Lobbing for home researchers on international level Define priority scientific areas that contribute to development of organic production **Organic production in official education** Develop new study programs and innovate the literature **Home market and export of organic products** Developed awareness about products with added value	**WO Policies** **Extension services in organic production** Maintain regular trainings for the advisors **Research and development in field of organic production and processing** Adjust the National strategy with international agenda for development of organic agriculture **Organic production in official education** Apply for projects and conduct the students exchange and professional staff on international level **Home market and export of organic products** Promote sign and organic products from domestic origin **Strengthening of the organic production** Develop institutional monitoring of authorized organizations for certification in organic production Investigate possibilities of using other resources from the IPARD program **Harmonization of the operative system of control and certification with the EU standards** Include penalty measures to prevent abuse of standards against producers and processors
ST Policies Strengthening of the organic production Establish data base in organic production according to the EU requests **Home market and export of organic products**	**WT Policies** **Organic production in official education** Adjust necessary number of professional staff to the practice demands **Extension services in organic production**

Collect new information about markets and conduct better logistic **Extension services in organic production** Develop producers and sellers opinion on new sales approaches **Research and development in field of organic production and processing** Develop and promote examples of good practice of cooperation between scientific institutions and producers, companies and other participants in organic production **Organic production in official education** Strengthen feedback between theory and practice in organic production **Harmonization of the operative system of control and certification with the EU standards** Find solution for export of organic products from Serbia to EU market without additional permissions	Direct producers to maximum use of the own resources **Harmonization of the operative system of control and certification with the EU standards** Strengthen the connections in the system of organic products control and custom inspection services **Research and development in field of organic production and processing** Give priority to applied research and creation of efficient products with added value Strengthening of the organic production Promote and develop public opinion on the importance of organic products **Home market and export of organic products** Promote selling of organic products through more channels and higher presence in wholesale and retail sale, green markets etc.

**) See annex for the full TOWS matrix*

Politics and support measures to the strategic axes

Strengthening of the organic production

- Harmonize legislative with the EU requests
- Integrate organic production in other strategies of the Ministry of Agriculture
- Develop institutional monitoring of authorized organizations for certification in organic production
- Investigate possibilities of using other resources from the IPARD program
- Establish data base in organic production according to the EU requests
- Promote and develop public opinion on the importance of organic products

Harmonization of the operative system of control and certification with the EU standards

- Harmonize work of the authorized control organizations with the EU requests
- Regularly update data base with the changes and additions to EU standards
- Include penalty measures to prevent abuse of standards against producers and processors
- Find solution for export of organic products from Serbia to EU market without additional permissions
- Strengthen the connections in the system of organic products control and custom inspection services

Extension services in organic production

- Develop specific criteria for advisors selection
- Maintain regular trainings for the advisors
- Develop producers and sellers opinion on new sales approaches
- Direct producers to maximum use of the own resources

Research and development in field of organic production and processing

- Develop common study programs and staff education with universities and research institutions in EU (Kassek, FIBL, etc)
- Lobbing for home researchers on international level
- Define priority scientific areas that contribute to development of organic production
- Adjust the National strategy with international agenda for development of organic agriculture
- Develop and promote examples of good practice of cooperation between scientific institutions and producers, companies and other participants in organic production
- Give priority to applied research and creation of efficient products with added value

Organic production in official education

- Develop new study programs and innovate the literature
- Apply for projects and conduct the students exchange and professional staff on international level
- Strengthen feedback between theory and practice in organic production
- Adjust necessary number of professional staff to the practice demands

Home market and export of organic products

- Developed awareness about products with added value
- Promote sign and organic products from domestic origin
- Collect new information about markets and conduct better logistic
- Promote selling of organic products through more channels and higher presence in wholesale and retail sale, green markets etc.

6.3. Conclusion and recommendations

On the basis of the analysis of value chain region-specific products for specific regions of Serbia, according to available data and inspection of the situation in the field, several conclusions can be made in the present study. Despite the presence of good opportunities and potential for the development of organic farming/production, for all the branches of primary agricultural production, the main problems in the preparation and organization of production are:

- Laboratory testing of soil in regard to the microbiological, physical and chemical, ecological and other opportunities for organic crop production requires large financial resources for potential producers in the primary production.
- In addition to the adopted legal framework and regulations in the technology of breeding, seed and planting material, as well as the use of other inputs (biological plant protection products, organic fertilizers and other organic inputs for top feeding etc., are not sufficiently under the control of professionals and experts.
- Relatively high investments in establishment of new crops, cultivated according to organic production methods, bring large risks. Producers receive support from the Ministry of Agriculture and Environment Protection of the Republic of Serbia - MPZŽSS, for certified planting material and certified organic production, but no certain marketing/placement of the final product. In addition to all investments and complying with the standards of organic production technology, because of the uncertain marketing/placement, they are forced to sell the final products as conventional. In this way, although the producers achieve positive business results, because they are forced to sell the products of better quality at a lower selling price, and have so called "lost profits". From the point of view of the relevant institutions, the Ministry of Agriculture and Environment Protection of the Republic of Serbia - MPZŽSS, with financial support for certification of organic production, the goal is not reached.
- In livestock production, the problem is in ensuring inputs (feed for livestock produced in organic conditions), especially in the winter period. This is especially current problem and issue in the analysed region of Southeast Serbia, which has extensive pastures and mountain meadows for the summer season of breeding livestock;
- The support granted for organic certification of farm/livestock, does not justify the aim - of stimulating the producer. They farm livestock in organic conditions, but do not achieve the true outcome/output in the chain of the organic product. Products originating from organic livestock farming are sold at the recommendation, with the confidence gained on the product origin and thus achieve a higher price than in conventional conditions. This applies especially on milk and dairy products (cheese, etc.), which are processed on the farm by family members. Livestock farmed for meat is sold in a similar manner, and if there is no buyer who is willing to pay more for products of better quality, the producers, sell their products at a lower selling price, as if from the conventional production. That is why, the livestock breeders, due to not having certified processing technology of organic products, in business, in spite of positive financial results, have "lost profits".

Producers who farm domestic animals of indigenous breeds (e.g. Karakachan sheep breed, Busha cattle, etc.) suffered further damage by not being eligible for any financial

support from the Ministry of Agriculture and Environment Protection of the Republic of Serbia – MPZŽSS, not even for cultivation in conventional conditions. Namely, the competent institutions provide support for registered heads, for which producers have proof of origin.

The additional problems occur in *the technology of finishing, processing and marketing of organic* products:

- In the analysed regions, the longest value chains are realized by products obtained in vegetable production in Vojvodina. However, the problem is insufficient and out-dated refrigeration and processing facilities. Due to the lack of possibilities of processing, producers are selling products from primary production as final, which reflects negatively on their business results.
- For producers of organic fruit, in both analysed regions, Western and Southern Serbia, organized purchase by subcontractors - cold storage facilities, represents a key motivation for producers to continue to engage in organic production. As explained above, this relationship is regulated through group certification, the owner of the cold storage facility/company is the holder of the certificate of organic production, and generally assumes all obligations in regard to the inputs and outputs of primary production of organic fruits. A further problem in this chain are cooling technology and marketing of products in bulk. The technology is out-dated and the question is whether organic products, in such circumstances, can maintain their quality. These are all elements that affect the quality and diminish the value of organic products.
- In organic livestock production, the certification, technical capacity, packaging and packing, are a huge problem. The primary organic livestock production, the highest level of the application of organic production methods is reached (i.e. closed cycle of production on the farm) on the other hand; there is the problem of "unfinished chain" of organic products. Thus, for example, meat from cattle reared in organic conditions, with the exception of the acquired trust with customers, cattle farmers otherwise cannot obtain a more favourable price for higher quality. While producers of fruit, in some way, through group certification, provide secure marketing/placement, cattle farmers are "left to their own devices". Livestock production requires large investments in the initial stages and facilities and regularly engaged labour force, which entails high risks and uncertainty for a longer period of time. Therefore, with the exception of support from the Ministry of Agriculture and Environment Protection of the Republic of Serbia – MPZŽSS, other motives for Sustainability of organic livestock production in this region are uncertain.
- In terms of awareness, marketing, logistics, etc., and taking into consideration the analysed products and individual regions, it can be concluded that the best level is achieved by the producers of organic vegetables in Vojvodina. Given that this is the most developed region, in the vicinity of large centres and the largest number of different economic activities, this fact is understandable. However, despite the available natural resources, a huge problem in other regions is the age structure of farmers. Older producers, who are mostly in less developed regions, show lack of interest in innovation and use of latest techniques and technology. It is important to note that in all regions there are certain associations or other forms of linking of stakeholders in chains of organic products. Such associations are active and

functional in achieving certain level of joint interests. So, with all the potential motives for engaging in organic production, socio-economic status and subsistence source of revenue are crucial.

Recommendations:

- At the national level, by regions and local level, to identify the capacities and potential funds for investment and providing of support for organic producers. In line with the strategy to have a uniform national database on soil quality and convenience of other resources for organic production.
- It is necessary to unify and improve the database on available seed and planting material for organic production in accordance with the requirements of EU.
- To support the diversification of subsidy support towards the implementation of innovative technologies of cultivation, storage, processing of organic products and to define priorities in organic production - agro-biodiversity, genetic resources, genetics and plant breeding, production of organic seeds and planting material, plant protection and plant nutrition systems, systems of breeding plants and animals, processing technology, socio-economic aspects, etc.
- Establishment of specialized loan programs for organic production within the credit policy the Ministry of Agriculture and Environment Protection of the Republic of Serbia – MPZŽSS.
- Improving the competence of the authorized control organizations in order to meet EU requirements in accordance with the Guidelines for import of organic products in the EU and acquiring of specific knowledge.
- Through representatives of the organic sector in the relevant working groups of the Ministry of Agriculture and Environment Protection of the Republic of Serbia – MPZŽSS, stronger connections with other ministries and other relevant institutions.
- Creating a favourable business environment for horizontal and vertical integration into chains of organic products - producer associations, clusters and cooperatives, connecting with supermarket chains that are capable of significant marketing of organic products and more intensive participation of SIEPA and VIP agencies in attracting foreign investment in the field of organic production.
- Define the guidelines for extension agents/advisors for organic production and perform their selection according to the defined qualification criteria for organic production, and enable their continuous education and training in line with global trends.
- Developing a network for the transfer of results obtained by scientific-research organizations and institutions to organic producers and feedback from practice to facilitate identifying problems in practice and finding appropriate solutions.
- Support to cooperation between research institutions, universities, institutes, research and development centres, agricultural extension services and other interested individuals and legal entities. Intensification of international cooperation through exchange and networking of researchers from universities and performing applied research to improve organic production.
- Analysis of the national market for organic products and organization of well

stocked and organized local outlets (markets and small retail shops) and establishment of a system of monitoring the needs of foreign markets, trends, prices and stakeholders.

- Training in the field of marketing for companies planning to approach the international market and support for the participation of Serbian producers and exporters in regional and international trade fairs for organic production.
- Continued work on the harmonization of the legal framework with EU requirements, and integration of sectors of organic agriculture in the IPARD program (Instrument for Pre-Accession Assistance for Rural Development), when the requirements stipulated by the regulations of the EU are met.
- Support to the Accreditation Board of Serbia (ATS) in order to comply with the requirements for accreditation in the field of organic production and the Guidelines for import of organic products in the EU (product certification) and related fields (testing and calibration).
- Support to laboratories conducting tests in the field of organic farming through various types of training in accordance with international standards.
- Investing in the packaging lines would be more productive of organic productions and to achieve faster return on investment. All of this is necessary to achieve continuity in the delivery, and this can be achieved either by purchasing of products or forming of associations of producers with the same or similar structure of production. All participants in the value chain of organic products should work together in a vertically integrated supply chain, to generate higher profits, achieve a better positioning in the market and meet consumer demand for organic vegetables and derived products, through their processing. Complex production conditions, the business environment changes, pressure from competitors, and huge fluctuations in demand, are forcing the development of an integrated system. Immediate action should be directed toward establishing an optimal balance between producers and trade institutions, and increasing the interest of all parties in the process of marketing integration. The growth, profitability and competitiveness of the sector must be improved through investments in all phases (production, processing and distribution) and changes in the export structure. Product packaging, design and transportation should be improved especially for the export markets.
- For successful production and secure-certain placement of organic products, it is necessary to develop a long-term strategy of organic farming providing guidelines for avoiding or mitigating the potential risks when investing, as well as in the implementation of agricultural-technical and management practices. Despite the problems plaguing the organic production in Serbia, trends of increase of used areas, yield, production and marketing of these products are positive. By eliminating or reducing the above mentioned problems, the trends would become even more positive and would achieve the quality, quantity and continuity in the chain of organic products. All this would contribute to greater profits for producers, processors and exporters and thereby improve the organic production in Serbia.

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8. ANNEXES

Annex 1

A- IMPORTANT INTERVIEW QUESTIONS FOR PRODUCERS OF ORGANIC FRUIT AND VEGETABLES

B- SPECIFIC QUESTIONS FOR LIVESTOCK BREEDERS

C- FOR PROCESSORS, IMPORTERS AND EXPORTERS OF ORGANIC PRODUCTS

Annex 2 **Figure 1** *Scheme of the value chain of organic products from the import*

Annex 3 **TOWS analysis**

Annex 4 **Outline of the study**

Annex 1

A - IMPORTANT INTERVIEW QUESTIONS FOR PRODUCERS OF ORGANIC FRUIT AND VEGETABLES

1) Please state the main motive for your orientation towards organic production of fruit, vegetables, etc.
2) Is this type of production the main source of your farm income, and please list the final market products?
3) The data regarding the age of plants, types and substrate for organic fruit production.
4) The technology used for growth and fruit production. Means used to prevent harmful biological agents – diseases, insects, weeds, pests, etc.
5) The data regarding the implemented technology and crop rotation in organic vegetable production.
6) Do suppliers of organic production inputs (biological plant protection agents, organic and other types of fertilizers) also provide advice on how to use them?
7) Please indicate the percentage of inputs (fertilizers, plant protection agents, fuel, lubricating oil, manual labor, etc.) in production costs of your product.
8) Please indicate a day's wages for hired workers during the peak season (for example, fruit harvesting).
9) Are the production costs of your organic product lower than the costs of the conventional production of the same product, and if so, how much in percentage?
10) How do you sell the final goods (unpackaged or packaged goods) and do you have product delivery (placement) problems? If yes, please state the important problems.
11) Do you get a better selling price than the same product from the conventional production, and if so, how much in percentage?
12) Have you ever taken out a loan, and if so, what were the terms?
13) Do you have any kind of support from the government (subsidies, premiums, etc.)?
14) Are you a member of National Association Serbia Organica, or any other association/cooperative, and if so, has that membership helped you in resolving problems which you have faced?
15) Can you get better terms through an association/cooperative (for example, for taking out loans, acquisition of inputs, placement, etc.)?
16) What changes would you make in your production and in organic production, i.e. organic agriculture in the country?
17) How do you see yourself in comparison to competitors from other countries and how much information do you have about innovation in production technology, substrates, etc.?
18) Do you cooperate with representatives of some of the advisory offices?
19) Have you attended educational tutorials/trainings about production, harvesting, packaging, placement, etc.? - If yes, what were the topics; if not, which topics should be covered in tutorials?
20) Do you plan to maintain current production (areas, types, categories), or are you considering making some changes, such as switching to conventional growing methods, or changing crops which you are currently growing?

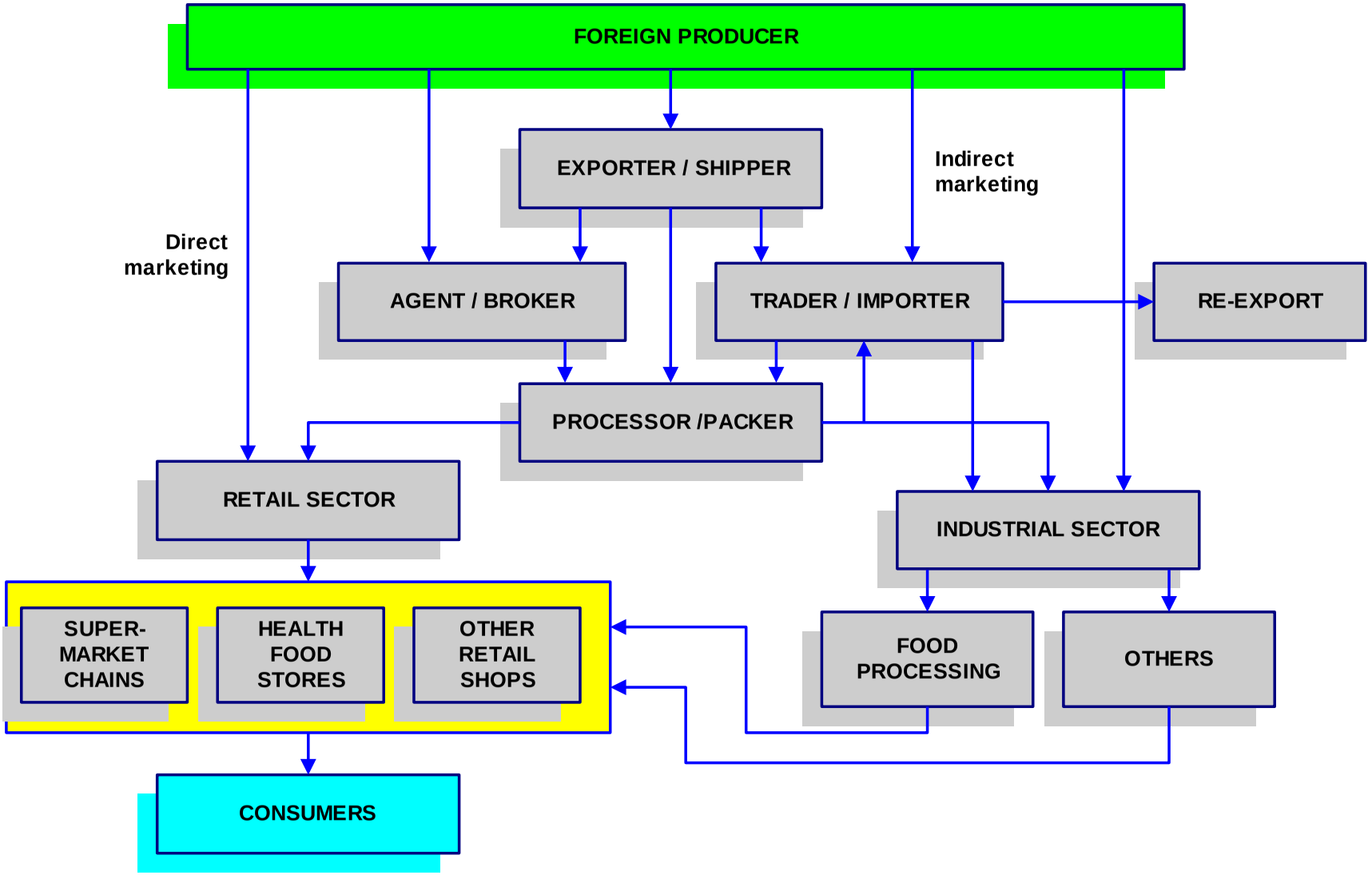
B - SPECIFIC QUESTIONS FOR LIVESTOCK BREEDERS

1) Types, categories and number of livestock which you keep on your farm.
2) Data on the initial (main) flock or herd (your own or acquired from elsewhere).
3) Did you have any kind of financial support for the initial herd and during the conversion period?
4) Please indicate the provision of food (your own or acquired from elsewhere) and the method of keeping livestock.
5) Do you have enough manpower on the farm? If you hire workers, please indicate a day's wages which you pay them.
6) Is there any veterinary clinic nearby, and if so, how often do you check the health of your animals?
7) Please indicate the final goods from the primary production, which you sell.
8) Do you have suitable packaging materials for final goods (for example, for milk)?
9) Who inspects the final goods and how often?
10) Is there a possibility of finishing and processing primary production products on the farm?
11) How do you resolve problems in case of animal death?
12) Have you had problems with your neighbors due to your organic livestock breeding?
13) Have you ever been forced to sell your organic products as the ones from the conventional production? If so, why, and did you have big financial losses at that point?
14) Is there sufficient co-operation with the same or similar livestock breeders?
15) Do you plan to invest in capacity for finishing, processing and packaging of the product? If so, where are you planning to get the funding from?
16) Is there a local association or the one in your surroundings, which has a plan (idea) on how to invest in capacity for finishing and processing of primary organic livestock products?
17) What is your opinion about the potential risks – insufficient amount of food for livestock, weak demand for organic products, the sudden emergence of animal diseases, etc.?
18) Have you insured your farm, and if so, what from? Should some more radical measures be taken, in order for livestock breeders to feel more secure?
19) Do you think that you are developing your farm in accordance with the latest domestic and international standards, and that final goods are helping you achieve better competitiveness in the domestic market and in sales abroad?
20) Please indicate the main problems regarding the improvement of production, processing and placement of organic livestock products

C - FOR PROCESSORS, IMPORTERS AND EXPORTERS OF ORGANIC PRODUCTS

1) Please indicate the capacity and program for processing/packaging of organic products of your company.
2) Are you familiar with the requirements for packaging organic products? Please name the certificates that the company possesses.
3) Do you have the data about the distribution channels for specific products or groups of products?
4) Do you have information about foreign markets to which you export or intend to export your products? Please indicate the most common problems which you have encountered during export.
5) Are you familiar with the data regarding import of certain organic products, country of origin, import trend (by volume and by value)?
6) Are you familiar with the data regarding consumer structure and demand for a certain organic product?
7) Are you aware of the market requirements (legislation, quality standards which apply to certain products, quotas, etc.)?
8) Are you familiar with import/export document requirements and customs regime?
9) Are you familiar with international agreements and trade exchange between Serbia and other countries?
10) Are you familiar with the data regarding organic product competitors in other countries?
11) Are you satisfied with business contacts and business meetings with potential exporters?
12) Are you satisfied with the logistics (information about the types of transport, procedures and costs for a certain product or a group of products intended for export to certain countries)?
13) Are you familiar with the data regarding retail and wholesale prices of organic products and their movement trends?
14) Are you aware of the possibilities for promotion in foreign markets, marketing plan, etc.?
15) Are you familiar with information about international trade fairs which are relevant for your company (where and when they are going take place, the application process, technical assistance, etc.)?
16) Do you require assistance and information about the development of products and companies (for example, information about what is necessary for your product to be eligible for export, or what is necessary for your company to be eligible to export products, etc.)?
17) Are you familiar with information about your financial support possibilities (such as domestic and foreign sources of finance - loans, different funds, donations, etc.)?
18) Are you familiar with information about investments in organic production capacities? Are you interested in joint ventures with potential foreign partners?
19) According to your opinion, what needs to be done in regards to developing organic products in order for them to be more competitive in domestic and foreign markets?
20) In what way should the environment and conditions in which your company/firm currently operates change?

Annex 2


FOREIGN PRODUCER
EXPORTER / SHIPPER
Indirect marketing
Direct marketing
AGENT / BROKER
TRADER / IMPORTER
RE-EXPORT
PROCESSOR /PACKER
RETAIL SECTOR
INDUSTRIAL SECTOR
SUPER-MARKET CHAINS
HEALTH FOOD STORES
OTHER RETAIL SHOPS
FOOD PROCESSING
OTHERS
CONSUMERS

Annex 3 *TOWS Analysis*

INTERNAL FACTORS	Major Strengths	Major Weaknesses
	Political Organic production sector is gaining in importance and priority within national strategies and programs Serbia. ***Economic*** Favorable agro-climate conditions for growing organic products Preserved greater number of indigenous plant varieties and livestock breeds The interest of producers to increase the area under organic production ***Social*** The interest of young people about the cultivation of organic products Achieving significant economic benefits and revitalization of rural areas ***Technological*** Production of biologically valuable and quality products A number of companies have developed programs for processing organic products *Ecological* Biodiversity and Environment suitable for organic production	*Political* There is no single record of the production, processing and marketing of organic products Insufficient control on the market for organic products (imports and domestic production) Insufficient control certification bodies Weak organization of competent advisory services for the sector of organic production ***Economic*** High input costs and consequently high production costs per unit of product A large number of small producers, with a series of small parcels, quite distant from each other, which reduces the profitability of production Some labor-intensive production requires significant involvement of the workforce, which used to be a problem in rural areas The high cost of warehousing and storage of organic products to maintain quality Unsatisfactory knowledge in management and marketing Lack of organized production, processing and distribution of organic products Lack of horizontal and vertical links in the chain of organic products A lot of products sold in bulk, which reduces their value Dominating the sale of products from primary production, a higher added value obtained in their processing

	Organic farming contributes to the conservation of natural resources *Law* National legislation in organic production is in line with EU regulations	Inadequate quality control of products placed on the market Weak association of producers in the sector of organic production Due to the poor organization of the organic sector, many manufacturers will in future give up on organic production ***Social*** In rural areas dominated by elderly households, with insufficient inflow of the working age population and low attractiveness of Agriculture Not enough confidence of farmers in the state institutions and incentives for organic production ***Technological*** Insufficient investment in capacity for processing organic products A larger number of manufacturers and technology adopted in addition to the primary production of organic products, there is a clear development plan for the processing, packaging, storage and marketing of products The lack of accredited laboratories for quality control and unprofessional performed physical and chemical testing of organic products creates a distorted picture of their origin and quality In regions with high potential for organic livestock farming, there is no accredited dairies and butchers for milk and meat organic origin *Ecological* Insufficient control of waste water and other harmful substances in the vicinity of the organic farm Insufficient support in the use of indigenous varieties and breeds *Law*

		Inadequate enforcement of ordinances to control organic production - biological plant protection products, organic fertilizers and other organic inputs for top feeding etc. are not sufficiently under the control of professionals and experts.
EXTERNAL FACTORS Major Opportunities *Political* Providing a larger amount of incentives to support the development of organic production of large amounts of financial resources within rural development Better connection between the participants in the value chain will lead to greater added value of organic products Protection of domestic organic production and branding of organic products The recognition of the specific role of the sector of organic production in the sustainable use of natural resources Support accreditation body Serbia in order to comply with the requirements for accreditation in the field of organic production and the guidelines for the export of organic products in the EU The inclusion of organic production in the IPARD program when the conditions prescribed by the EU regulations Preparing a comprehensive national action plan for organic farming in Serbia with clearly defined measures and indicators for their implementation	SO Policies Strengthening of the organic production Harmonize legislative with the EU requests Integrate organic production in other strategies of the Ministry of Agriculture **Harmonization of the operative system of control and certification with the EU standards** Harmonize work of the authorized control organizations with the EU requests Regularly update data base with the changes and additions to EU standards **Extension services in organic production** Develop specific criteria for advisors selection **Research and development in field of organic production and processing** Develop common study programs and staff education with universities and research institutions in EU (Kassek, FIBL, etc) Lobbing for home researchers on international level Define priority scientific areas that contribute to development of organic production **Organic production in official education**	WO Policies **Extension services in organic production** Maintain regular trainings for the advisors **Research and development in field of organic production and processing** Adjust the National strategy with international agenda for development of organic agriculture **Organic production in official education** Apply for projects and conduct the students exchange and professional staff on international level **Home market and export of organic products** Promote sign and organic products from domestic origin Strengthening of the organic production Develop institutional monitoring of authorized organizations for certification in organic production Investigate possibilities of using other resources from the IPARD program **Harmonization of the operative system of control and certification with the EU standards**

Economic In areas of growing organic products develop and rural tourism Diversification of organic producer and diverse product offering for tourists Potential increase in selling prices of organic products manufacturers and motivation to achieve greater economic benefits The increase in value added organic products through, finishing, processing and marketing, quality and packaging design. Great export opportunities organic products ***Social*** Applications for promotion and consumption of organic products, including health information. ***Technological*** The introduction of new technologies and education of producers and processors on the possibilities of increasing the quantity and quality of production and achieve quality, quantity and continuity Support laboratories for analysis in the field of organic production in accordance with international standards *Ecological* Special incentives for organic production in protected areas designated in accordance with the law of conservation of natural resources	Develop new study programs and innovate the literature **Home market and export of organic products** Developed awareness about products with added value	Include penalty measures to prevent abuse of standards against producers and processors

Greater control and better use of the remains of plants and livestock farms to organic fertilization *Law* Preparing a strong legal framework for the production, processing and quality control The simpler and shorter the payment of subsidies for organic production Preparing records of organic products - yields, prices, stocks, imports, exports and other important indicators. Continuing work on the harmonization of the legal framework with EU requirements		
Major Threats *Political* Insufficient support for certification processing capacities for organic products Insufficient support in integrating stakeholders along the vertical value chain of the organic sector Incentives for the period of conversion, partial reimbursement of the cost of certification, not the best solution in the long term for producers of organic products ***Economic*** The decline in purchasing power and weak demand for organic products High investments in plantations and cattle breeding for organic and lack of support from the state	ST Policies Strengthening of the organic production Establish data base in organic production according to the EU requests **Home market and export of organic products** Collect new information about markets and conduct better logistic **Extension services in organic production** Develop producers and sellers opinion on new sales approaches **Research and development in field of organic production and processing** Develop and promote examples of good practice of cooperation between scientific institutions and	WT Policies **Organic production in official education** Adjust necessary number of professional staff to the practice demands **Extension services in organic production** Direct producers to maximum use of the own resources **Harmonization of the operative system of control and certification with the EU standards** Strengthen the connections in the system of organic products control and custom inspection services **Research and development in field of organic production and processing** Give priority to applied research and creation of efficient products with added value

Since there is no certified dairies and butchers and therefore not the existence of the final phase of the product of organic farming livestock producers are forced to sell their milk and animals for meat as conventional origin, so for all that abandon organic farming ***Social*** Lack of manpower and young farmers because of the rural exodus A significant part of the population does not know the benefits of organic products, while one part of the population has no confidence about the origin of organic products *Ecological* Lack of control of natural resources - land and water sources for organic production *Law* Lack of respecting the standards and regulations are incomplete, may lead to corruption and other abuses in the sector of organic production	producers, companies and other participants in organic production **Organic production in official education** Strengthen feedback between theory and practice in organic production **Harmonization of the operative system of control and certification with the EU standards** Find solution for export of organic products from Serbia to EU market without additional permissions	Strengthening of the organic production Promote and develop public opinion on the importance of organic products **Home market and export of organic products** Promote selling of organic products through more channels and higher presence in wholesale and retail sale, green markets etc.

Annex 4

Outline of the study

1. **EXECUTIVE SUMMARY**
2. **INTRODUCTION**

   Concept, objectives, methodology used for analysis, sources of information, type of information and structure of the document

3. **ENABLING ENVIRONMENT AND AGRICULTURAL POLICY RELATED TO ORGANIC FARMING** [2]

   - **Brief description of the current macroeconomic environment;** *Impacts of policies in terms of the GDP and the agricultural GDP performance, the impact of macroeconomic policies on the ability of the state to formulate and carry out policies regarding the organic agri-food chain. (Subsidies, taxes, tariffs, international trade agreements, economic factors like GDP, inflation rate, real income of consumers, international market trends etc.)*
   - **Certification and quality control;** *Institutions capacity; Accreditation; Certification bodies; Certification bodies for organic; Adopted standards*
   - **Research and advisory support;** *Research system; Advisory services and their capacity to respond to producer need in: Technology for primary production and processing, Marketing, Farm management, Business development*

4. **IDENTIFICATION OF REGION SPECIFIC ORGANIC FOOD PRODUCTS (OFP) WITH POTENTIAL COMPETITIVENESS ON DOMESTIC AND INTERNATIONAL MARKETS**

   - **Brief description of major characteristics of four regions and their potential for organic production**
   - **Production and domestic consumption** *in terms of quantity and the production value.*
   - **Current market trends;** *Domestic market (volumes, prices, quality, varieties, standards, purchase location); Export and export market requirements (Quality requirements, Official standards, Voluntary standards), Domestic market opportunities, Import substitution, Export market opportunities.*
   - **Assessment of impact on farm incomes**

5. **ANALYSIS OF MAIN COMPONENTS AND PERFORMANCE OF SELECTED OFP VALUE CHAINS**

   - **A brief description of distinctive organic food products value chains;** *Chain components, main stakeholders and types of organisation (Input suppliers, Producers, Processors, Producers and processors organisations, Traders, Wholesalers, Retailers, Consumers); Chain maps and flows*
   - **Inputs** *(seeds, fertilisers, plant protection, machinery, labour force, information, financial resources etc.: availability, price, interest rates)*

[2] To avoid replication, preparation of this chapter should precede preparation of other sections of regional OFP studies, and should be done at the country level.

- **Production level** *(average size of the farm, production structure, applied technology, productivity, average yields, quality of the production, profitability –costs/revenues-, cost of certification, management skills, investments, future development plans, vertical and horizontal integration/coordination and cooperation, typical sales channels, how these influence the purchasing and selling prices, technological and management challenges due to organic farming)*
- **Processing** *(technology, productivity, profitability –costs/revenues-, management skills, investments, future development plans, vertical and horizontal integration, how these influence the costs and selling prices, organic certification and other food qualification systems, such as ISO, BRC, IFS, availability, cost of these system, how these influence the costs and selling prices, technological and management challenges related organic processing, additional fix and variable costs due to organic method)*
- **Wholesale** *(domestic and export market perspectives, logistics, competition in the market, profitability, vertical and horizontal integration in the sector, challenges)*
- **Retail** *(domestic market perspectives, consumer habits, expectations towards the suppliers, challenges, consumers' information and their attitudes toward organic foods, economic conditions of the consumers, price sensitivity, shopping habits)*
- **Prices costs and margins** *Price costs for raw material and producer gross margins; Calculation of production costs for small and big producers / processors; Price cost and gross margin at packer level; Price costs and gross margin at processor level; Market prices (during the year, by location)*

6. RECOMMENDATIONS AND PRIORITIES FOR IMPROVING EFFICIENCY AND COMPETITIVENESS OF SELECTED OFP VALUE CHAIN

7. REFERENCES

8. ANNEXES