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## **Serbia**

### **National report**

**(WP 2 - Deliverable 2.2)**



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## List of abbreviations

CAP – COMMON AGRICULTURAL POLICY

CEFTA – CENTRAL EUROPEAN FREE TRADE AGREEMENT

CS – CASE STUDY

EBRD - European Bank for Reconstruction and Development

EU – EUROPEAN UNION

FAO - UN Food and Agriculture Organization

FGD – FOCUS GROUP DISCUSSION

FYR – FORMER YUGOSLAV REPUBLIC

GDP – GROSS DOMESTIC PRODUCT

GIS – GEOGRAPHICAL INFORMATION SYSTEM

GM – GENETICALLY MODIFIED

ISAA - INSTITUTE FOR SCIENCE APPLICATION IN AGRICULTURE

ITC – INFORMATION AND COMMUNICATION TECHNOLOGY

LAG – LOCAL ACTION GROUP

MAEP – MINISTRY OF AGRICULTURE AND ENVIRONMENT PROTECTION

MAFWM – MINISTRY OF AGRICULTURE, FORESTRY AND WATERMANAGEMENT

PDO – PRODUCT DESIGNATION OF ORIGIN

PW – PARTICIPATORY WORKSHOP

R&D – RESEARCH AND DEVELOPMENT

RAS – DEVELOPMENT AGENCY OF SERBIA

RS – REPUBLIC OF SERBIA

SIEPA – SERBIAN AGENCY FOR EXPORT PROMOTION

SORS – STATISTICAL OFFICE OF REPUBLIC OF SERBIA

UAA – UTILIZED AGRICULTURAL AREA



# 1 The executive summary

Serbia belongs to the group of small open economies, and agricultural sector risks and strategies are influenced by the global factors. However, the performed analysis clearly shows that concepts and strategies applied in practice are generally based on low risk awareness of agricultural producers and less developed individual risk control strategies. Instead, producers are trying to "share the risk with the state/government" or to address the main issues of risk control and sustainability to "the responsible policy maker" (both at the local and national level) and agricultural and rural policy measures applied in practice.

According to the media analysis, the following approaches are applied in practice: (1) traditional approach comprising of measures directly applied in the farm practices - diversification on the farm, and rural economy diversification - implementation of complementary activities of rural economy at the local level, such as tourism, trade and processing; (2) "the old story" - producers are still waiting for the strong state support, both in direct and indirect ways; (3) agricultural and rural development policy measures applied at the local level are oriented toward improvement of management quality and farmers skills (training, education and innovations).

The year by year the policy instruments are exposed to significant changes. From 2000 to the present, four characteristic stages have emerged: the first (2001-2003), with policy oriented towards price support for specifying agricultural crop (soybean, sunflower, sugar beet, wheat); the second (2004-2006), that abolishes price support and introduces support for investment; the third (2007-2008) that brings numerous non-market measures and puts more interest in rural development; the fourth (2008 forward), governed in the economic crisis conditions with absolute marginalization of specific measures aimed at quality improvement and support to areas with difficulties. A particularly important issue in agriculture is the labour force and its characteristics. Serbia rural areas are generally characterized by depopulation process and very pronounced emigration process. These two components virtually leave Serbian villages "empty".

The relative amount of public spending on agriculture in Serbia is not low, due to difference in relative prices and the size of GDP. However, the absolute amount of public spending on agri-sector per hectare of utilized agriculture in Serbia (69 EUR/Ha) is considerably lower than the EU-27 average (476 EUR/Ha). However, it is comparable in terms of size and development to some other countries such as Croatia (379 EUR/Ha) and FYR of Macedonia (148 EUR/Ha). At the same time, public spending on agri-sector in Serbia, per hectare of utilized land is considerably higher than in Bosnia and Herzegovina and Albania, being close to the amount in Montenegro. This suggests that public spending for support to agri-sector in Serbia is sufficient to maintain competitiveness of Serbian farmers in the CEFTA region<sup>1</sup>. However, the level of public spending to agri-sector in Serbia is lower than in the EU. Relatively lower state aid available to Serbian farmers, together with implementation of the Stabilization and Association Agreement, which provides for large scale liberalization of agri-sector market in Serbia with regards to the EU market players, put Serbian farmers under substantial pressure.

The share of input subsidies has continuously increased over the analysed period. Since 2007 input subsidies have become a dominant scheme of budgetary support to agriculture, with their share of total agricultural budget exceeding 45 percent (in 2010 even reached 72 percent). However, the structure of input subsidies has changed dynamically, with a tendency to concentrate on diesel fuel and mineral fertilizers in the last few years. The subsidies on interest rates or insurance premiums should be also added as well as the warehouse system implementation. The last enables agricultural producer to keep his produce in a warehouse which provides guarantees that the produce will be safe, and that its quality and quantity will be preserved. At the same time, the warehouse system gives a producer the freedom to

choose when and at what price he is going to sell his produce. Agricultural producer is not forced to sell the goods in order to obtain money, since as long as the goods are stored in a public warehouse, he can obtain a short-term loan on the basis of warehouse receipts issued on the account of stored goods. This system could be also implemented in the fruit sector (cold storages).

Two cases were selected for in-depth analysis at the national level: Wheat sector in Vojvodina and Raspberry sector in Sumadija and West Serbia Region. Behind this choice stands a crucial effort to isolate the essential problems of commercially-oriented and market-integrated producers of wheat in Vojvodina. Additionally, our efforts were also put on the analysis of the main issues faced by the system of family farming in central Serbia (Raspberry CS). Both sectors have specific challenges and inherent. In the first phase an analysis of various sources (policy documents and strategies, scientific articles, as well as public media and blogs) was performed. This analysis provided a general overview of both conditions and limitations that agricultural producers are exposed to. The insights from the stakeholders' point of view were obtained by focus groups discussion and participatory workshop.

## **Executive summary A: Wheat sector in the Region of Vojvodina with focus on young farmers**

### **Wheat farming and concerns about sustainability**

Young farmers (less than 40) are more interested in emerging agricultural technology and making things grow in the different way than in previous business practices. Serbia is generally faced with huge demographic problems. The rural areas in Serbia are characterized by depopulation process and very pronounced emigration process. However, crop farming in Vojvodina is a sector with younger farmers who are continuing family business, or simply starts agricultural production on the land that was abounded by their parents during the socialist period.

The first associations on sustainability are connected with environment protection. Our participants emphasized importance of biodiversity and shed a light on consequences of intensive chemicals use in wheat production. They are more oriented toward use of four-course system in crop production which reflects certain traditionalism. Producers also think about economic conditions such as price volatility, increase of production costs and input-output parities which influence their income.

Wheat farmers younger than 40 years might have a different approach than other wheat farmers. According to the expert opinion these farmers often think about the economic part of their businesses, but the social or the environmental part is less important for them. They are also less oriented toward community development goals.

### **The main strategies and institutional support**

The following topics are in the focus: quantity, quality, price risk management and farm income, fixed and variable costs, relations with other food chain stakeholders (traders and processors), production reorientation and crowding out of marginal producers (Table 1).

When they talk about strategies to overcome the risk, producers are mainly concentrated on their own practice. They think about different activities that they can do during the production process to ensure a

better market position. As they cannot affect the price, they are considering ways in which they could affect cost reduction (total and per unit of production). They want to be recognized as the modern producers, but they use wheat as the only winter crop that plays a significant role in the sowing structure for crop rotation purposes. Crop rotation can help to control of pests and diseases to maintain soil quality, and ensure enough nutrients are available to different crops each year.

**Table 1: The list of discussion topics in the focus and strategic goals in the wheat sector/ Vojvodina**

Quantity	To control weather risk
	To control productivity growth
	To improve management skills, to control chemicals use in production, to improve market skills.
Quality	To reach higher standards in production
	To guarantee standards
Price risk management and farm income	To improve management skills, to control price risk
	To address other sources of income
Other food chain stakeholders - traders, processors and consumers	To address public health and environmental issues
	To control power of different market players
Product reorientation	To improve competitiveness
Quit the agricultural production	To modernize agriculture

Farmers have faced different problems and they can use different instruments to overcome the risks and assure farm business sustainability (Table 2). They can use traditional instruments such as insurance, product differentiation based on quality standards (higher quality of wheat should reflect higher price), farm income diversification (based on additional activities - larger producers integrate pre-harvesting and post-harvesting services, while others think about additional activities in rural economy or in other sectors using opportunity for part-time farming), cooperation within producers organizations etc. However, they are still arguing that there is a need to improve instruments related to financial stability and risk control. These improvements are usually connected with reforms such as adaptation of the new legislative, the new institutions establishment, education of all stakeholders that are going to implement new instruments and strategies in practice.

The report also elaborates different "state projects" related to institutions development that can help farmers to manage the risks (Table 3). Strong support to the new risk control instruments development / agricultural insurance and price hedging based on the innovative financial instruments is evident. It aims to support market institutions establishment that could help agricultural producers to cope with a wide range of risks. The newest initiative appeared as the result of public-private partnership. Based on project financing the information technologies are intensively implemented for purposes of farm management decision making process improvement. Using GIS system different data based on micro location can be gathered in a big information data base (big data), while all farmers can use their mobile phone to access the system and to monitor current state of their plants in the field. Farmers are advised when and how to use different chemicals to improve soil quality or to protect their plants from diseases. Consumers also benefit from this system as less chemicals are put on the field. Producers can use this technology to control their variable costs and to improve income sustainability. As they still cannot to strongly influence the price of wheat, they can take care about costs control. On the other side, state support is also important in

different institutions development related to warehousing, warehouse receipts and pre-harvesting financing.

**Table 2: Farmers' strategies**

<b>Category in focus</b>	<b>Bottom-up approach</b>
Quantity	Insurance
	IT in agriculture
	Education
Quality	Differentiation of products by quality
Price risk management and farm income	Education, Developing of business plan with other alternatives around agriculture in rural areas
	Part-time farming Involvement in the local initiatives and projects
Fixed cost	Credit lines and leasing
Variable cost	IT in agriculture
Consumers	To offer higher value added products To offer sustainable practices
Traders and processors	Straitening producers' power throughout producers groups, cooperatives, contracting.
Product reorientation	Developing of business plan with other alternatives in agriculture
Quit the agricultural production	Find new business alternatives

Serbian government also tries to follow the EU model for investments support on the farm governed toward structural adjustments in agriculture during the pre-accession period. These investments are also connected with establishment of practices that make farmers businesses less risk-dependent. The largest farms, mostly organized in the form of agribusiness systems (the legal entities) recognized importance of these investments. On the other side, only the strongest family farms can afford investment which will result in return of money spent in asset procurement from the state budget with significant delay.

It should be also noticed that the Directorate for Agrarian Payments, as a part of the Ministry of Agriculture and Environmental Protection, in the context of the EU assessment was established by the Law on Agriculture and Rural Development (Official Gazette of the Republic of Serbia 41/09). Directorate performs the activities related to the implementation of the subsidies program in agriculture, making calls for applications, decides upon the right to assistance, making payments to the final beneficiary, performs administrative and on the spot checks, establishes and keeps accounting records of contractual obligations and payments, implements international assistance to agricultural policy in the Republic of Serbia, and manages the Farm Register. One of the goals of the Directorate is fulfilment of the requirements for using of the European funds in the area of agriculture. Unfortunately, this agency still waiting for certification from the EU authorities, and farmers in Serbia cannot use the EU funds for improvement of their businesses (IPA fund for rural development).

**Table 3: The strong institutional support is requested**

Category in focus	Top-down approach
Quantity	EuropaRE
	Research & Big data analysis
	Extension service
Quality	Law on Public Warehousing
	Laboratories
Price risk management and farm income	Innovative instruments for price risk control
	Farm income support
Fixed variable costs control	Support for investment in new technologies
	Research & Big data analysis
Consumers, traders and processors	To protect food consumers
	To protect natural environment
	Law on Competition
	Institutional arrangements and contracting
Product reorientation	Specialization of regions
Quit the agricultural production	Fostering of capital concentration and centralization

### The Survey results

The analysis is focused on young farmers (younger than 40 years) and farms above 20 ha of agricultural area used for the production of wheat as the additional criteria. The sampling frame, i.e. the list of primary producers is obtained using the Census data (2012). The data collection was supported by the agricultural extension service in the Region of Vojvodina. The interviews were conducted in December 2017 / January 2018. The sample size is 150 and the final database contains 140 responses (10 interviews were rejected due to inconsistency in answering, e.g. very low understanding of questions by farmers – in these cases the lowest level of understanding is marked in the questionnaire). The larger farms dominate in the sample (the smallest number of farms belongs to the group of less than 10 ha of total area). Young farmers represent a group slightly over a third of our sample. The youngest farmers on average belong to group of the largest farms (44.25 years based on total area and 41.67 based on wheat area on average). As far as farmers education is concerned, higher educated farmers manage the largest farms on average (around 260 ha in total and 93 ha in wheat area). Traditional gender structure is manifested by larger share of male population in the role of farm holder, while the share of lower secondary education among surveyed farmers reached 70% of our sample.

Formal and informal arrangements co-exist, although the informal arrangement is more popular and therefore, widely accepted. The informal agreement at the time of sale is most represented in our sample (n=52), followed by legal contract before or during production (n=35). The least frequency is recorded for collective organization membership (n=12). It might be controversial that collective type of sale dominates our sample. It can be explained by specific characteristics of the Serbian “cooperative” sector where limited number of farmers hold membership, while majority of farmers play role only of a coop-partner (so-called “kooperanti”), referring that membership is not precondition for institutional arrangement with cooperatives in Serbia.

The higher average income in total is generated on farms of larger size. However, it is interesting to notice that the average wheat price is higher for the group of farms from 10 to 50 ha in comparison with other

firm size groups (both in total and wheat area). Average price reported by all farmers for the year 2016-17 is 0.15 EUR/kg. However, farmers who are involved in individual sale channels managed to reach higher commodity price of EUR 0.166 in comparison to the collective price of EUR 0.143, on average. In the total sample of farms production costs as share of selling price vary between 40-100%, being on average 76.69%.

Most sales agreements are made either for particular sale (n=55), or they last between 7 months and 1 year (n=42). Surveyed farms reported limited number of medium (n=21) or long run contracts (n=3). Without stable price arrangements (in medium and long run), it is hard to run the farm business successfully. Most of the payments in this sample belong to the category “at delivery” of the product or even “before” that, which implies standard form of price formation. At delivery payments are more common to the individual sales channels, but payments before are more common to the “collective” ones. The price of wheat is in most cases defined based on the market supply and demand conditions.

Among the relevant standards, quality and food safety are dominantly imposed to both collective and individual sales channels, while animal welfare standards are not mentioned at all. The law on animal welfare is still not adopted in Serbia, although the Law on Food advocates for this issue specific regulation. On the other side, producers in Serbia are obliged to implement GM free practices.

The predominant opinion among wheat producers is that only some social and economic factors are more important in the farm/production sustainability, while the environmental factors do not have so much influence. However, the older group of farmers gave higher ponder to the soil quality and animal welfare. The linkages among farmers and stakeholders are the most important aspect of social sustainability. It is interesting that the older and less educated producers pay more attention to the social recognition of their farming activities (probably the influence of the tradition), while less educated producers still have very high opinion about arable land value when it comes to succession. On the economic side, the profitability maintenance and investment opportunities are generally the highest scored (even higher than wheat prices and other market conditions).

The level of satisfaction in both subsamples (individual and collective arrangements) indicates that wheat farmers are generally satisfied with the sale agreements. The overall opinion of the wheat producers in Serbia is that climate change and market prices are the two most important factors that will shape some future strategies. The factor - "Market prices" is singled out as one of the most important factors of the future sustainability by almost all groups of producers, although that some groups, like older or less educated producers, “don’t know well what this factor really means”.

The surveyed farmers reported what their strategies for the development of wheat within the context of farm business in the coming five years are. The larger wheat farmers (above 50 ha) report that they want to expand production (it is more important for this group than in other groups), while the highest share of response “to abandon” farming was reported in the group of 10 to 50 ha. When it comes to age structure, younger farmers (below 40 years) are more prone to expand farm activity, while abandonment or reducing of farm activity is more present when it comes to older farmers. It is also important to notice that among farmers from 50 to 250 ha the group of older is overrepresented, and many of the interviewed farmers in this group have no expectations regarding successors (the strong demographic problem is present). Insurance and investments dominate among selected strategies related to improvement of wheat farmers’ production in the Region of Vojvodina, while market plans dominantly include diversification and new forms of partnership. The specific food chain structure requests better coordination and cooperation both among farmers and between farmers and other food chain stakeholders in Serbia. Additionally, the active role of farmers is recognized in the area of sales channels innovation and income insurance as the strategic response to price fluctuations.

## **Executive summary B: Raspberry sector in the Region of Sumadija and West Serbia with focus on small family farms**

### **How the current situation can be described in brief?**

The description of the current state in the sector is based on the obtained results of literature review related to the market and regulatory conditions and stakeholders' insights obtained by the focus groups discussions and participatory workshop.

The rural areas of intensive raspberry production have similar problems as other rural areas in Serbia in general. The most important problems are: low productivity, small farm size, insufficient state support, inadequate and insufficient infrastructure, lack of equipment and machinery, limited economic activity, lack of investment, low level of education and lack of initiatives, lack of marketing and limited membership in cooperatives or associations, and inadequate planning by local policy makers.

Recently, the negative trends in raspberry production have appeared due to the unfavourable structure of the farms (small holdings, aggravation of the aging structure of farmers) and high raspberry price volatility. Price volatility is caused by uncertainty and unpredictability and that discourages investment in production, storage and processing. This is also the result of the unfavourable market structure, where buyers / distributors of raspberries have a stronger position than the primary producers. The strong state support programs for the procurement and construction of cold storages for raspberry sector and establishment of new forms of cooperatives are needed, so that primary producers can be more flexible in terms of the time of sales of their products.

**Problem 1: *Unpredictability of price.*** Due to the lack of strong institutional arrangements in the production chain, agricultural producers depend on the price determined by cold storages (traders). Producers of raspberries do not have an agreed price for their product. In addition, they are forced to buy inputs for production using unusual contracts - the input price is set, but not the future raspberry price in which they will make the final payment.

**Problem 2: *Great dependence on export companies and the lack of producer organizations.*** Small and medium-sized cold storages work for a few big market players / exporters. The weakest position in the Serbian food chain belongs to farmers. They are unorganized, divided and without adequate representation in the various governing bodies. There is a limited number of organizations (cooperatives) that can help farmers to sell their raspberries to wholesalers and processors. Producers' organizations should play a key role in the development of the sector. The strict implementation of The Competition Law is requested. However, there are no instruments that will allow forward contracting - the trade in advance, for the known customer and at a predetermined price.

**Problem 3: *Infected planting material.*** The infected planting material was imported 14 years ago. They are still in use influencing the appearance of fungi in the rainy years. It is a huge problem as raspberry producers don't know how to deal with it. It significantly reduces yields, although the planted surface is larger, and the root of the plant is dried.

**Problem 4: *Excessive and uncontrolled use of chemicals.*** There is a huge, uncontrolled activity of agro-technical lobby. Their goal is to sell as many inputs (pesticides, herbicides, fertilizers) as they can. This can also cause problems in the European market in the future. There is a need for strict control of the use of chemicals in production. The appropriate experts-advisors (the extension service) can give advice on the ground, rather than traders.

**Problem 5: *Lack of laboratories.*** Laboratories are needed to test the presence of heavy metals and pesticides in fruits. The purchase of all necessary equipment is covered by international funds and projects, but these laboratories are still not operative or active in Serbia. In addition, there is no effective and modern state advisory service.

**Problem 6: *Better organization in case of weather accidents.*** The state subsidizes insurance premiums for agriculture, while the municipality has the system of protection against heavy rains. Although awareness of the necessity of insurance is growing in recent years, the supply of insurance services is inconsistent. In many municipalities, the organization of the protection against heavy rains service is inadequate or doesn't even exist. A better organization is needed, the state does not support meteo-stations with adequate payments (often there are not enough missiles). In the practice better results are given by local initiatives in this area.

**Problem 7: *Lack of adequate scientific research that would support and allow dissemination among farmers.*** Primary raspberry producers are forced to experiment by themselves. They buy new varieties of raspberries and raise new experimental plantations under greenhouses, apply different technologies, monitor differences in yields and product quality. There is a lack of a common scientific approach to the advisory service that should help agricultural producers to overcome various barriers. There is also a lack of link between technological research and the needs of the sector.

**Problem 8: *Uncontrolled import of raspberries*** from Bosnia and Herzegovina, Kosovo, Albania and Macedonia, which is of poor quality. It is usually mixed with domestic raspberry as traders cannot deliver the contracted quantity. Due to poor quality raspberries are often returned from export.

**Problem 9: *Financing production.*** The Ministry of Agriculture has introduced short-term and long-term lending programs, under more favourable terms than bank loans give, but these conditions can hardly be met by small producers.

**Problem 10: *Inconsistent agricultural policy and inadequate state support.*** Policy is often changed without a clear goal, it does not deal with rural development at all. The agricultural budget is constantly changing, but its structure deviates from the EU model. There is a trend to reduce budget expenditures for the food and rural development sector over the past five years.

**Problem 11: *A very fragmented ownership.*** Serbian raspberry farms are small, usually organized as a seasonal family business. The average area of the raspberry farms is between 0.5 and 1 ha, making it difficult to take advantage of the economies of scale and production costs are usually high. The farms are poor technology equipped.

**Problem 12: *Lease of agricultural land.*** Family farms do not meet the requirements of the Law on Agricultural Land for long-term lease. Therefore, state land that could be used to increase the production of raspberries is simply unused / out of production. It is necessary to change the conditions for leasing the land to 20-30 years so that they can satisfy family farm needs.

**Problem 13: *Very small share of processed raspberry products in export.*** The bulk of the raspberry production is for export. Almost 90% of raspberry production is frozen, while only 10% is used for processing or fresh retail sale. Exports are fairly variable and dependent on several markets (almost 60% of exports go to 2 countries and more than 80% of exports to 6 countries in the World).

**Problem 14: *Declining competitiveness in the international market.*** The low presence of market-oriented producers is evident, with intensive production and modern technology applied in their practices. It is



necessary to innovate and improve technology. Production systems must be significantly improved in the future. Educational programs supported by the government or municipalities in the region of Sumadija and Western Serbia should play a key role. Particular attention should be paid to the implementation of food quality standards.

**Problem 15: Excessive expectations and reliance on the state.** The food chain stakeholders are used to be directed by others. They have not adapted to the new conditions seen in "the invisible hand of the market".

### The way out - the main alternatives and strategies

The activities can be done by the producers themselves, while some of the identified problems require the broader institutional support. Certainly, it is not the question of direct forms of state support. Instead, we should speak about a model of macro regulator that creates the adequate conditions for better business development and facilitate the sustainable rural areas.

Producers are constantly asking themselves what they should do to mitigate or control different plant diseases risks, what they should do to avoid extreme draught or heavy rains with hails (or at least to control cost and minimize profit lose), what they should do when they deal with powerful partners such as traders or exporters inside their own food chain, how much they are empowered during the market negotiation process, why there are no instruments for price risk control, why they cannot lease the state land to organize modern agricultural production, what they should do with different lobby groups that advocate for increase of chemicals use on the farm... There are too many unknowns in this equation. The main barrier is seen in excessive expectations and reliance on the state. However, the main strategies are identified in the mix of state (national or local) and farmers' actions (Table 4). Without state support farmers will do their business as usual with continuing obstacles related to modern agribusiness development.

**Table 4: Conditions, state support and strategies for Raspberry CS in Serbia**

Conditions	Institutional support	Farmer strategies
<i>Infected planting material, Excessive and uncontrolled use of chemicals</i>	<b>Integrative import control</b> on input suppliers, <b>The extension service development</b> - development of the specific educational programs for end users (farmers).	<b>Right to be educated and protected</b> - workshops, trainings, LLL programmes, farmers are seen as the end users of transferred knowledge who actively support definition of training programmes etc.
<i>Lack of adequate scientific research that would support and allow dissemination among farmers, Lack of laboratories</i>	Public financing of data analysis for farm management decision making - <b>Big data implementation</b> for management purposes	<b>Intensive use of IT technologies for knowledge transfer</b> - how we can make big data systems easily available for the average farmer: what chemicals and when should they use in their production to minimize environmental effects and maximize profit.
<i>Unpredictability of price</i>	<b>Creating the environment for</b>	<b>Use of innovative financial</b>

<i>Financing production</i>	<b>effective and efficient price control:</b> Public warehousing (warehouse receipt model), Establishment of <b>micro-finance institutions</b> (particularly important for small businesses), designing of the specific farms credit arrangements - banks should be supported to create the specific contracts for agricultural producers such as <b>landing based on warehouse receipts</b> etc.	<b>instruments</b> - the agricultural commodity derivatives (forward contracting, futures contracting, options on futures etc.), development of the micro-finance institutions, designing of the specific credit arrangements that fits farmers needs due to specific cash flow,
<i>Great dependence on export companies and the lack of producer organizations, Uncontrolled import of raspberries, Declining competitiveness in the international market, Very small share of processed raspberry products in export</i>	Building of <b>the specific market environment</b> with strong market players on both sides (supply and demand) and development of the <b>Quality schemes</b> supported by the agricultural budget.	<b>Long term contracting</b> with processors, traders and exporters, <b>Labelling</b> - farms orientation toward PDO/PDI or organic production, <b>Processing</b> - juice industry, frozen fruit industry etc., <b>Creation of unions of the small family owners with cold storages.</b>
<i>Better organization in case of weather accidents</i>	Development of the state or local community meteo-stations that will help farmers to avoid unnecessary weather risks (heavy rains with hail), creating of the global reinsurance system (EuropaRe).	<b>Investments on the farm in protection of hails</b> (this activity can be supported by subsidised credit arrangements with lower interest rates) and better planning on the farm regarding the climate change effects.
<i>A very fragmented ownership, Lease of agricultural land</i>	<b>Land market institutions:</b> better functioning of Real Estate Cadastre, Law on agricultural land and long term leasing, commassation, inheritance law and agriculture (right of pre-purchase).	<b>Cooperation in the new equipment use between farms at the community level.</b>
<i>Inconsistent agricultural policy and inadequate state support</i>	<b>Consistent agricultural policy &amp; long term planning:</b> what should be our priorities in the next 30 years?	<b>To be prepared for efficient use of available additional resources</b> such as subsidies both on national and local level.

The key words are efficient institutions and market oriented and organized small raspberry family business in the Region of West Serbia and Sumadija. Small family business related to raspberry production in the

region is often organized in the form of part-time farming. This additionally aggravates the situation related to traditional system transformation to a modern agribusiness. However, the transition process has influenced the position of the Region of West Serbia and Sumadija inhabitants. Without permanent job opportunity (many industrial capacities were closed due to its inefficiency, while the establishment of new companies cannot absorb high unemployment rate), they turned more intensely on agricultural production, production in which they have a long tradition. All stakeholders can benefit from the better organized food chain, while agricultural producers can organize better functioning business on the farm if they use modern risk management instruments. These instruments can help risk avoidance, minimizing of risk exposure and cost on the farm, maximising input-output ratio both in terms of quality and quantity and securing the better product price.

### **The survey results**

The data collection was supported by the Municipality of Arilje. The face to face interviews were conducted in December 2017 / January 2018. The sample size is 150 and the final database contains 131 responses (19 interviews were rejected due to extremely low level of understanding by respondents).

Based on total area, farms above 1 ha dominate in our sample. However, observing only area under raspberry production, small family farms are more represented in the sample than others. Young farmers represent a group slightly over a third of our sample. Traditional gender structure is manifested by larger share of male population, while the share of lower secondary education level among farmers is almost 60%.

The average income per farm is 11,180 euro. The information about the cost of raspberry production is collected as well, and the average share of cost in total income collected in raspberry production is 64.85%. Average price was EUR 1.29 in the total sample of farms. Collective sale channels managed to reach higher raspberry price of EUR 1.31 in comparison to individual ones price of EUR 1.29, on average. Most farmers indicated (n=123) that the commodity price is variable and linked to market price at the time of delivery, while a significant number of farms bases price on the quality of raspberry delivered (n=80).

Individual sale channel dominates the collective one. Collective arrangements are mainly used by larger, commercial raspberry farms (2.84 ha with 1.24 ha for raspberries, on average). However, it is also emphasized that collective arrangements are associated with more detailed and structured contracts in favour of primary producers.

Our respondents highly agree with two statements – that there are no other alternatives to sell their products and that the payments are made with significant delay. Farmers emphasize that traders are fully in charge of price definition and contract specifications. Even farmers that use collective arrangements report lower level of agreement with statements related to higher price achievement, stabile price and fair negotiation. Generally, the level of satisfaction in both subsamples indicates that farmers are neither satisfied / not unsatisfied with sale agreements. This also provides opportunities for further improvements in the future.

Concerning the type of sale agreement, a legal contract before or during production is present in 49 cases, followed by legal contract at the time of sale (n=3), and significant number of informal contracts, 47 before or during the production and 23 at the time of sale. Most sales agreements are made either for particular sale (n=49), or they last between 7 months and 1 year (n=51). Very short (up to 3 months) and very long (above 5 years) contracts are rather limited in this sample.

Quality and food safety standards are dominantly imposed to both collective and individual sale channels. Animal welfare is not mentioned at all, while standards related to preservation of nature and environment, as well as standards related to mitigation and adaptation to climate change are recognized as relatively less important.

Farmers perceived knowledge about overall production sustainability is very low. The lowest knowledge is about the ecological aspects. The issues considering soil quality is the best known to producers, while the biodiversity and the water quality maintenance are considered to be not so important. On the other side, the farmers highly appreciate influence of the social network developing with other stakeholders and farmers in the sector, and this influence is reported as the most important aspect of the social sustainability. Younger producers perceive the most of the social, economic and environmental conditions of the sales agreement sustainability more important than older producers, and more educated producers are more conscious about ecological and environment conditions of the sustainability.

The most important factors that will influence farms business in the future, and consequently their sustainability, are related to climate change and market conditions, while the least influence on the future farms sustainability will have institutional regulations. The surveyed farmers reported the dominant intention to maintain production. The majority of farmers don't have specific expectations regarding farm succession. The rural areas in Serbia are depopulation areas and the rural population is continuously shrinking. Consequently, because of the bad age structure the demographic perspective of the rural areas is not bright (low or even negative natural increase rate). In such situation, the farmers do not have any clear future plans. If we take into account the answers "don't know" within the analysis, there are more than 4/5 of the sample that are not willing to think about the future plans at all. However, farmers don't consider selling of property as the valid solution.

## 2 Introduction

Two cases were selected for in-depth analysis at the national level: Wheat sector in Vojvodina and Raspberry sector in Sumadija and West Serbia Region. Behind this choice stands a crucial effort to isolate the essential problems of commercially-oriented and market-integrated producers of wheat in Vojvodina. Additionally, our efforts were also put on the analysis of the main issues faced by the system of family farming in central Serbia (Raspberry Case Study - CS). Both sectors have specific challenges and inherent characteristics. Both sectors have specific challenges and inherent characteristics that may be useful in further generalization of the conclusions regarding available strategies related to avoiding and control of different forms of financial risks in agriculture today.

In the first phase an analysis of various sources (policy documents and strategies, scientific articles, as well as public media and blogs) was performed. This analysis provides a general overview of both conditions and limitations that agricultural producers are exposed to, and gives the first indication of applied strategies aiming to control different sources of risks in agricultural practice. The aim of this document is to show the state regulation and policy towards the agricultural sector in general and to analyse the extent to which public policy creates more favourable conditions for agribusiness development in a changing environment.

## 3 Media Content Analysis - a short review

Transition to the market economy and improvement of business strategies are generally based on the harmonization with the EU legislation and practice. Serbia is a small open economy, and agricultural sector risks and strategies are influenced by the broader conditions present at the global level.

The performed analysis clearly shows that concepts and strategies applied in the practice are generally based on low risk awareness of agricultural producers and less developed individual risk control strategies based on the self-controlling practices. Instead, producers are trying to "share the risk with the state/government" or to address the main issues of risk control and sustainability to "the responsible policy maker" (both at the local and national level) and agricultural and rural policy measures applied in the practice. According to the media analysis, following approaches are applied in the practice:

(1) Traditional approach comprising of measures directly applied in the farm practices:

- Diversification on the farm- definition of wider scope of products produced at the farm. Recently, the strategy took in importance particularly if we have in mind environmental protecting policy context: *Steady planting of wheat and other winter crops occurred since winter crops suffered almost no damage from the extreme drought of the previous years and even experienced higher yields;*
- Rural economy diversification - implementation of complementary activities of rural economy at the local level, such as tourism, trade and processing.

(2) "The old story" - producers are still waiting for the strong state support, both in direct and indirect ways (role of the agricultural subsidies and market institutions):

- The agricultural policy in Serbia is not governed properly as the policy measures are changing from the period to period, mainly depending on the policy decision makers.

- However, strong support to the development of the new risk control instruments / agricultural insurance and price hedging based on the derivative instruments is evident aiming at building of market institutions that could help agricultural producers to cope with wide range of risks.

(3) Agricultural and rural development policy measures applied at the local level are oriented toward improvement of management quality and skills (training, education and innovations).

The main findings directly related to the agricultural policy and regulatory environment, as well as to the market conditions, connected with selected sectors and products, are listed below.

**Regulation and Policy:** *Basic subsidies for plant production* - the minimum subsidy for plant production is around 50 Euro per ha. According to the rulebook, this type of subsidy could be claimed once a year and it applied to all plant species. *Subsidies for investments in agriculture, including the subsidies for new perennial fruit* with a view to improving competitiveness and achieving quality standards - the aim of this subsidy was to improve the competitiveness of agricultural producers in primary production and processing. The subsidies amounted to 30 % of the investment value, 45 % in areas with difficult farming conditions. The maximum amount a beneficiary could receive was 2 million RSD, with defined minimum amounts relative to cost (soil preparation and planting, chemical and mechanical analysis of soil). The subsidies for investments in primary agricultural production covered the following: procuring new mechanisation and equipment for primary agricultural production and investing in raising the yield and the quality of crops. Investments in fruit sector included subsidies on the programmes focusing on new intensive plantations using contemporary fruit growing technology with trellises, and soil preparation for new plantations. In addition to the costs, subsidised land areas were also limited. Berry fruit of 0.3-5 ha were subsidised. The maximum amount per subsidy was 2 million RSD, except the case of building cold storages (5 million RSD).

**Inputs:** *The input subsidy on fuel* granted producers purchasing for production inputs, calculated per litre of purchased fuel. Registered farms were entitled to 120 litres of fuel per hectare, at 50 RSD per litre of fuel (provided if they had met legal requirements).

**Finance and risk management:** *Input subsidy on the crop production insurance premiums* - the total input subsidy was 40 % of the paid insurance premium. Subsidies for investments in agriculture with a view to improving competitiveness and achieving quality standards - the aim of this subsidy was to improve the competitiveness of agricultural producers in primary production and processing. *Investments* - analyses show unfavourable agricultural credit conditions, which are not in accordance with its role and its importance for the sector development. Main obstacles to a higher use of loans are seen as follows: the instability and uncertainty of the agricultural and food production, unsafe placement of unknown prices of agricultural crops in the torque delivery and inconsistent agricultural policy measures. Other factors add to the limiting factor for greater investments in agriculture and a low rate of return of agricultural production, which is limited by low yields, low productivity, and price disparity. It is necessary to introduce coordinated activities of all state authorities, which would allow the reduction of the political, institutional and financial risks. Therefore, existing mechanisms for micro and macro agricultural finance in Serbia are not adequate and should be changed.

**Socio-demographic:** *Coping with farming decline:* ageing and farmer's renewal and position of the young farmers.

**Ecological:** *Subsidies for sustainable rural development* are achieved through subsidies for organic production and on plant and animal genetic resource preservation. The subsidies for organic production are paid for organic plant production and input subsidies on fuel for organic production. These subsidies are

40 % higher than those for conventional production. They were intended for producers whose production was undergoing conversion, for producers who have finalised conversion and were in the process of certification. The relevance of climate change is also important topic discussed at scientific, public and policy level.

**Socio-Institutional:** *Input subsidies on the cost of storage in public warehouses* were introduced to allow for the full implementation of the Law on Public Warehouses for Agricultural Products and to allow producers to sell their products at the most convenient moment while incurring the lowest possible costs. The right to input subsidies on the cost of storage in public warehouses was granted for the entire month as of the date of the stock record, or for maximum six months. The input was 40 % of storage costs for up to 2,000 tons of stored wheat and/or maize (corn). *Advisory and technical services improvements in agriculture* (scientific research, development and innovative projects in agriculture through agricultural measures and actions, advanced professional training and upgrading human resources).

**Technological:** *The subsidies for improvement of the rural economy through introduction and certification of systems for food safety and food quality, organic products and products with geographical indication.* The subsidies are envisaged as partial reimbursement of the cost of introduction of and certification for internationally accepted standards such as ISO 22000, FSSC 22000, BRC, IFS and GOST-R. The cost of introduction and certification in accordance with the GLOBAL G.A.P. standard and specific standards such as HALAL and KOSHER was also reimbursed. Regarding creating added value for products, the aim was to encourage the certification of food and agricultural products with geographical indication and certification of organic products.

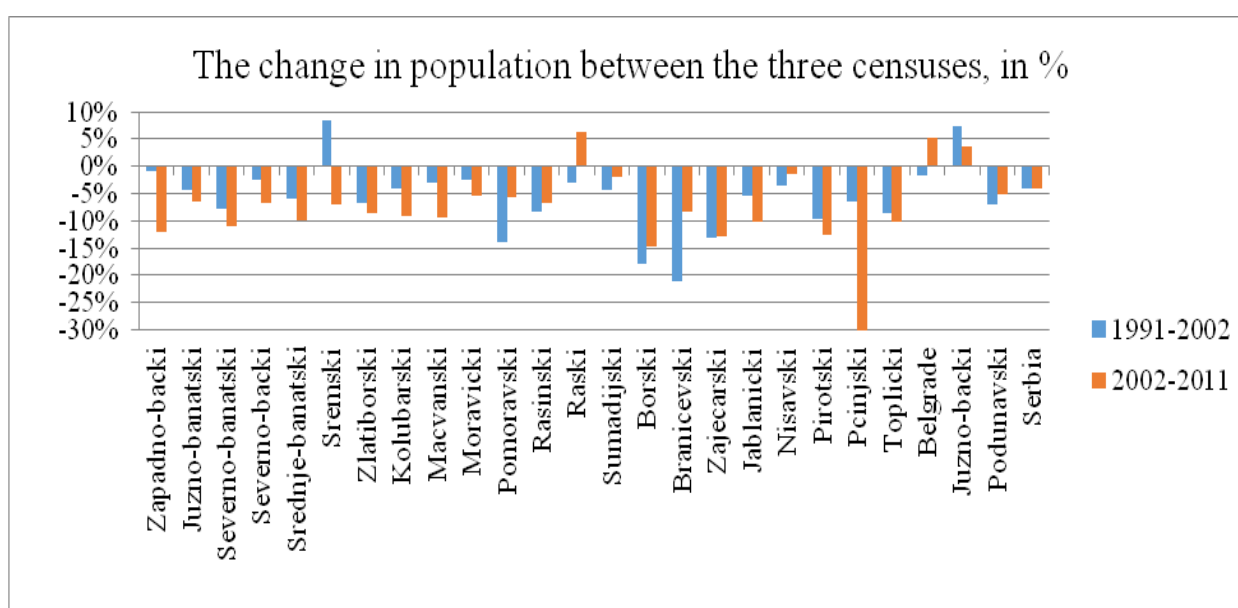
**Demand:** Bakery companies at national level strongly support the sector development. They absorb more than 50 % of total production and produce higher value added products both for the national and international markets. Changes present in the area of health food production (whole grain products) might influence the production structure in the future related to crop varieties. On the other side, raspberry is high value added product with potential health improvement properties (good structure of antioxidance).

Broader context of media analysis was presented in a separate document (WP1 - TASK 1.1 - Subtask 1.1.3: MEDIA CONTENT ANALYSIS). Market strategies of farmers are highly influenced by agricultural policy measures aiming to create the adequate business environment and help farmers to avoid/control different risks. The framework of policy applied in the practice in the chosen sectors in Serbia is analysed below. In addition to the specific characteristics of the policy pursued in selected sectors, the general policy framework was analysed first, giving the overview of the most important measures of agricultural support applied in our practice. The period 2000-2015 is covered with a specific emphasize on current state support to the agricultural sector development in Serbia.

## 4 Rural population and its structure as a particular problem

A particularly important issue in agriculture is the labour force and its characteristics. The rural areas are generally characterized by depopulation process and very pronounced emigration process. These are the two components of the demographic virtually "empty" Serbian villages, which is why one cannot speak of any natural renewal of rural population. Due to the economic conditions in large parts of Serbian rural areas, the reversible migration processes are almost impossible to expect.

Rural population decreased for 10.9% in the period 2002-2011 (in 1.000 rural settlements there are less than 100 inhabitants - every fifth settlement is just to be vanished) (Fig.1). The worst situation is in the southern and eastern parts of the country where the population decrease is about 19% in that inter-census period. And only in Sumadija and West Serbia region rural population dominates with 52.6% in total population in the region.

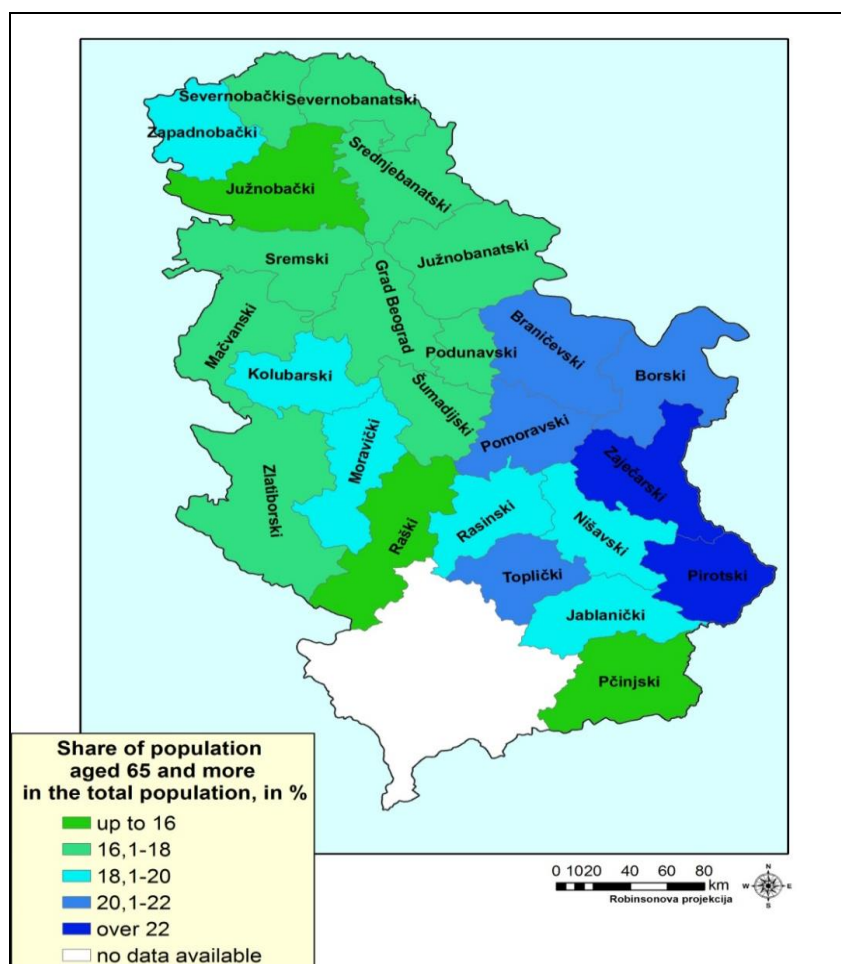


**Figure 1. Rural population growth in Serbia by districts, 1991-2011**

Source: SORS

Such trends in population growth resulted with certain age structure of rural population in Serbia. Demographic analysis show that every fifth inhabitant of rural area in Serbia is older than 65 years (over the 20% of total rural population belongs to the age group 65 and older and there is only 14% of young people, up to 14 years old). It is evident that the worst situation is in the southern and eastern parts of the country (depopulation process is the highest there).



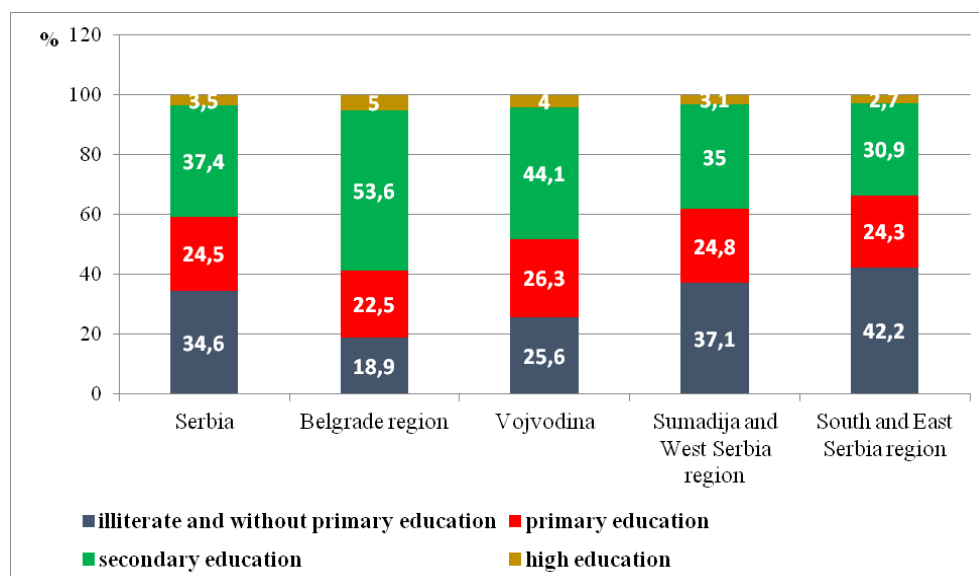


**Map 1. Age structure of the rural population in Serbia by districts, 2013**

Source: SORS

Broken down by age cohort of household, there is very small share of young people (up to 35 years of age) and it is mostly in very small farms (up to 1 ha), only around 4%. Considering large farms (over 50 ha), that share is considerably higher and amounts to 23%. Holders of agricultural units age of 65 years and more dominated in small size holdings (up to 5 ha) and their share ranges from 32-38%, while the share of the elderly as a carrier holding when it comes to large holdings (over 50 ha), is only around 4 %.

For the rural area development quality of labour force is very important. In that context, the educational structure of rural population is one of the key variables. In Serbia, education of rural population is not very encouraging (more than half of the rural population older than 15 years has primary education at the most) (Fig.2).



**Figure 2. Educational structure of rural population in Serbia by regions, 2013**

Source: SORS

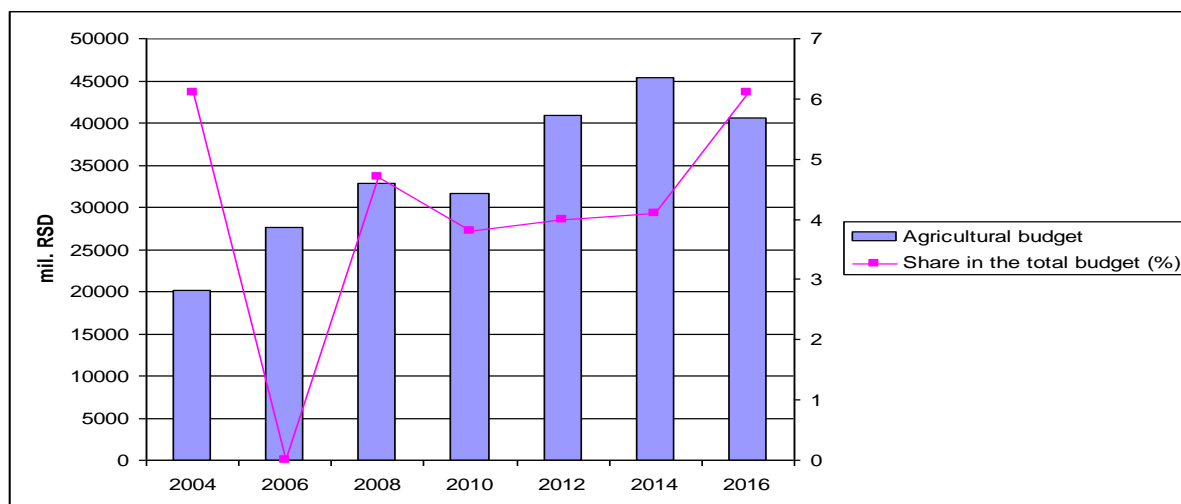
Comparing two regions, Vojvodina in the north and West Serbia and Sumadija region in the Central Serbia, it is evident that there is very small share of the high educated people in both regions (3-4% of total population older than 15 years). It is not very favourable situation.

However, considerable disparities are evident considering the amount of the illiterate and those without primary education (not finished primary school): in Vojvodina there is 25.6% of total rural population and In West Serbia and Sumadija region that share is much higher, over 37%. Same trend of regional disparities is noticeable when analysed secondary education of rural population: in Vojvodina over 44% of rural population over 15 years has some kind of secondary education and in West Serbia and Sumadija region that share is quite lower, 35%

## 5 The agricultural and rural development policy

### 5.1 Agricultural and Rural Development Policy in Serbia: institutional framework

The Agricultural and Rural Development Policy in Serbia has changed constantly. Instability of agricultural policy is evident. From 2000 to the present, four characteristic stages have emerged: the first (2001-2003), with policy oriented towards price support for specifying agricultural crop (soybean, sunflower, sugar beet, wheat); the second (2004-2006), that abolishes price support and introduces support for investment; the third (2007-2008) that brings numerous non-market measures and puts more interest in rural development; the fourth (2008 forward), governed in the economic crisis conditions with absolute marginalization of specific measures aimed at quality improvement and support to areas with difficulties.



**Figure 3. Agricultural budget in Serbia (2004-2016)**

(Source: Own calculation based on the budgets regulations)

Starting from the 2008 programs of agricultural sector support and regulations were changed and/or abolished several times (even in the same year) and payments to producers were delayed. It contributed to the creation of an unstable and unfavourable economic environment for agriculture.

As a result, the agriculture budget varied in size (Figure 3), with clear indications of deviations in its structure from the EU model (Figure 4). Generally, trend of decreasing of budgetary expenditure for food sector and rural development in last five year exists. The largest part of the funds is still spent in direct support measures (mainly for input subsidies). Contrary, the environmental protection, improvement of quality standards and strengthening of the market chain, support to the marginal areas and small producers are totally ignored since the beginning of the economic crisis.

#### **An illustration / Changing policy environment:**

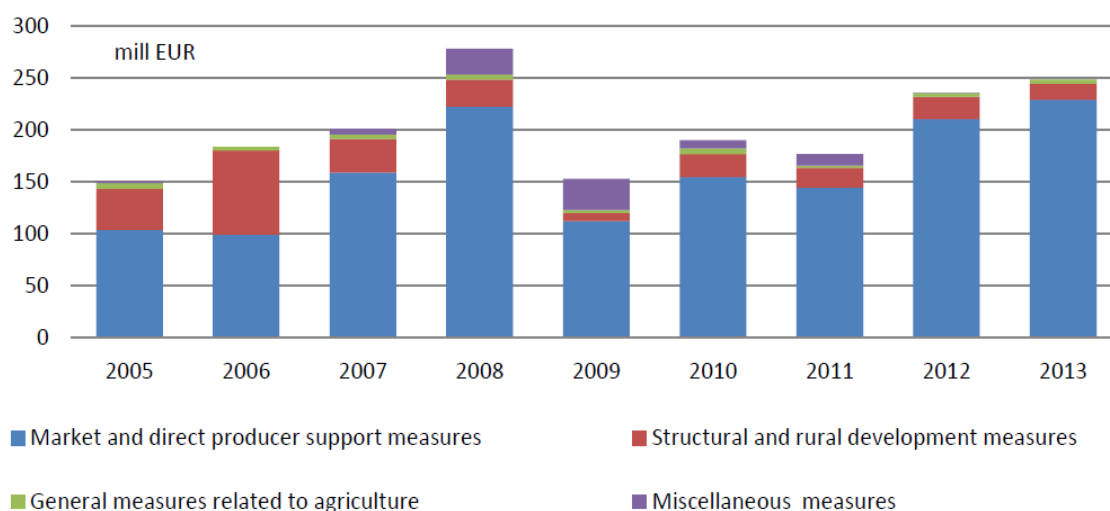
**Facts:** In 2015, the agricultural budget amounted to 24.3 billion RSD, which is about five billion less than in 2014 when agriculture received almost 29 billion RSD. In 2013, the agricultural budget amounted to 31 billion RSD.

**Explanation:** "This reduction was a result of the proposal to subsidize agricultural holdings up to 20 hectares, and not to provide subsidies for the issuance of state land lease." (Policy maker)

**Comments:** "Agricultural policy makers emphasize that the new government should lead a new agricultural policy of Serbia - probably a new minister is going to build a new agricultural policy." (<http://www.makroekonomija.org/0-branislav-gulan/buducnost-agrara-srbije-2016-i-deo/>)

"Subsidy funds should certainly increase, regardless of the form." (Producer)

The general opinion is that it is necessary to improve the agricultural state support, but also to increase the resources intended for supporting agriculture. Subsidy funds should certainly increase, regardless of the form of support in order to improve agricultural production and to reduce rural poverty in Serbia.



**Figure 4. Breakdown by budgetary support to agriculture by pillars in Serbia (2005-2013), mill EUR**

(Source: Bogdanov and Rodić (2014), *Agriculture and Rural Policy in Serbia*, print in ed. T. Volk, E. Erjavec and K. Mortensen, *Agricultural Policy and European Integration in South-eastern Europe*, FAO, p. 162)

In the year 2016 the policy measures are defined by the REGULATION 8/16 - THE DISTRIBUTION OF INCENTIVES IN AGRICULTURE AND RURAL DEVELOPMENT IN THE YEAR 2016 (Official gazette RS 8/16). The following measures are applied:

(1) Law on Budget of the Republic of Serbia for the year 2016, the Ministry of Agriculture and Environmental Protection, Chapter 23.1 Fund to encourage the development of agricultural production in the Republic, 0103 Incentives Program in Agriculture and Rural Development, Function 420 Agriculture, forestry, hunting and fishing, Program activity / project 0005 credit support to agriculture, Economic Classification 451 - Subsidies for public non-financial enterprises and organizations (credit support - interest rate subsidies) were identified funds in the amount of 800 million RSD, which are allocated in accordance with this Regulation.

(2) Law on Budget of the Republic of Serbia for the year 2016, the Ministry of Agriculture and Environment, Chapter 23:10 Department of Agricultural Payments, 0103 Incentives Program in Agriculture and Rural Development, Function 420 Agriculture, forestry, hunting and fishing, Strand / project 0001 Direct payments, Economic Classification 451 - Subsidies for public non-financial enterprises and organizations (direct payments - basic incentives for crop production; payments for fuel and fertilizers; subsidies on insurance premiums for crops, fruits, nurseries and animals; incentives for genetic improvements in plant and animal production) were identified funds in the amount of 20,430,670,000 RSD, which are allocated in accordance with this Regulation.

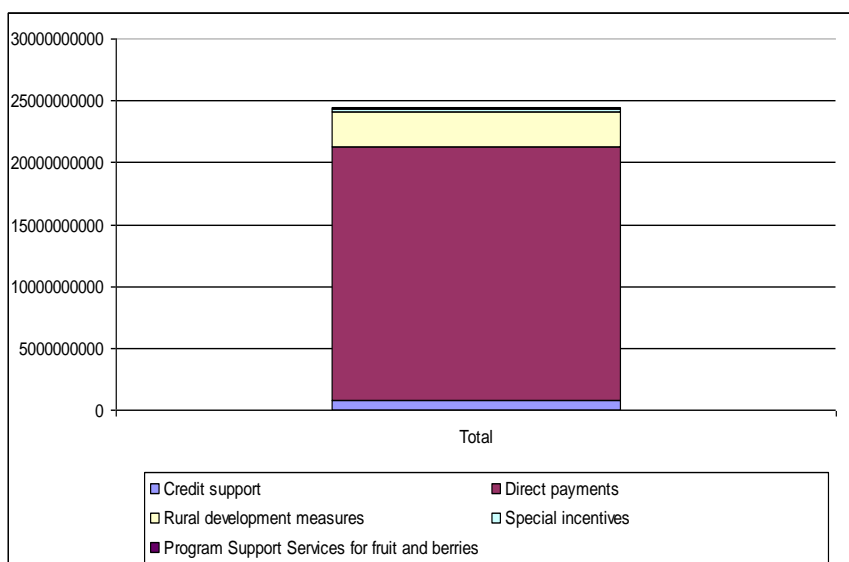
(3) Law on Budget of the Republic of Serbia for the year 2016, the Ministry of Agriculture and Environment, Chapter 23:10 Department of Agricultural Payments, 0103 Incentives Program in Agriculture and Rural Development, Function 420 Agriculture, forestry, hunting and fishing, Strand / project 0002 Mere Rural development, Economic Classification 451 - Subsidies for public non-financial enterprises and organizations (rural development measures - raising new perennial plantations of fruit trees, vines and hops; support for development of primary agricultural production; support to improve the quality of wine and brandy; labelling of food and wine; purchase of equipment in the sector of meat, milk, fruits, vegetables and grapes; organic production; conservation of plant and animal genetic resources; the promotion of economic activities in the countryside through support for non-agricultural activities; economic activity in terms of

adding value to agricultural products, as well as the introduction and certification of food safety and quality, organic products and products with geographical indications) determined the total funds in the amount of RSD 2,896,950,000, of which 2,296,950,000 RSD of budget funds and 600 million pounds of assets of financial assistance of the European Union for funding IPARD measures. Budget funds in the amount of RSD 2,296,950,000 shall be distributed in accordance with this Regulation until the funds financial assistance of the European Union for funding IPARD measures in the amount of 600,000,000 distributed through public competition, in accordance with the special act - IPARD Programme.

(4) Law on Budget of the Republic of Serbia for the year 2016, the Ministry of Agriculture and Environment, Chapter 23:10 Department of Agricultural Payments, 0103 Incentives Program in Agriculture and Rural Development, Function 420 Agriculture, forestry, hunting and fishing, Strand / project 0006 Special incentives, Economic Classification 451 - Subsidies for public non-financial enterprises and organizations (special incentives - implementation of incentives for scientific research, development and innovation projects through measures and actions of support promotional activities in agriculture) were identified funds in the amount of 233 million RSD, which are allocated in accordance with this Regulation.

(5) Law on Budget of the Republic of Serbia for the year 2016, the Ministry of Agriculture and Environment, Chapter 23:10 Department of Agricultural Payments, 0103 Incentives Program in Agriculture and Rural Development, Function 420 Agriculture, forestry, hunting and fishing, Strand / project 4002 Support to the private sector for fruit, berries and berries in southern Serbia, Economic Classification 451 - Subsidies for public non-financial enterprises and organizations (Program Support Services for fruit and berries in southern Serbia - donation of the Kingdom of Denmark). The total funds are determined in the amount of 110,001,000 RSD, of which 66 million RSD of budget funds and 44,001,000 RSD funds donated by the Government of the Kingdom of Denmark for the implementation of the program of support to the private sector for fruit, berries and berries in southern Serbia. Budget funds in the amount of 66 million RSD are allocated in accordance with this Regulation.

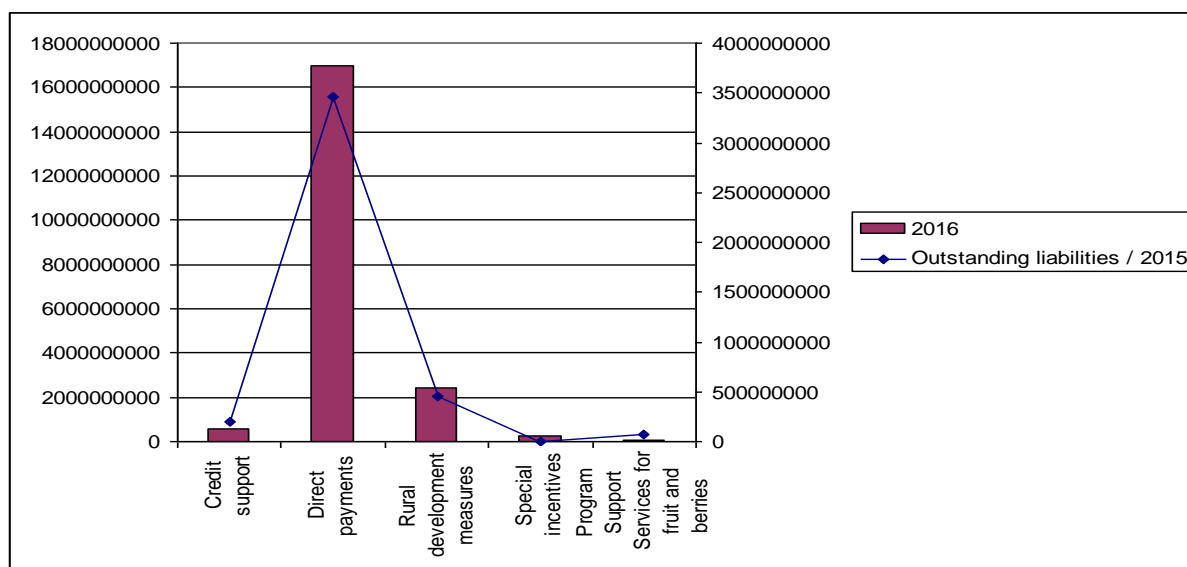
Having in mind previously mentioned, different forms of direct payments are overrepresented in the total payments for agricultural and rural development in Serbia.



**Figure 5.** The distribution of incentives in agriculture and rural development in the year 2016

Source (Official gazette RS 8/16)

Additionally, the total sum of public support to agricultural and rural development in the year 2016 includes also the unpaid obligations (outstanding liabilities) from the previous year. The existence of this category clearly indicates that subsidies are paid irregularly and their dynamics often don't correspond to the official contracts that farmers hold with the Agency for Agricultural Payments.



**Figure 6.** Outstanding liabilities 2015 and support in 2016.

Source (Official gazette RS 8/16)

Finally, the basic developmental framework is defined by the “umbrella” of national strategic documents such as the National Program for EU Integration of Serbia, the Strategy of Poverty Reduction of Serbia, the National Sustainable Development Strategy, the National Economic Development Strategy, etc. The majority of these strategic documents stress the significance of agriculture and rural areas for the Serbian economy and for the preservation of the natural environment. The sector’s key strategic document –The Strategy of Agriculture Development –was adopted in 2005. Following the first strategic document in the agricultural sector, the Strategy of Agriculture and Rural Development for the 2014-2024 period was adopted in 2014, as well as the National Development Programme for Agriculture and Rural Areas. The establishment of the Directorate for Agrarian Payments (the Paying Agency for IPARD and later the EU CAP) is going to contribute to transparency and accountability of the agricultural system support in the future.

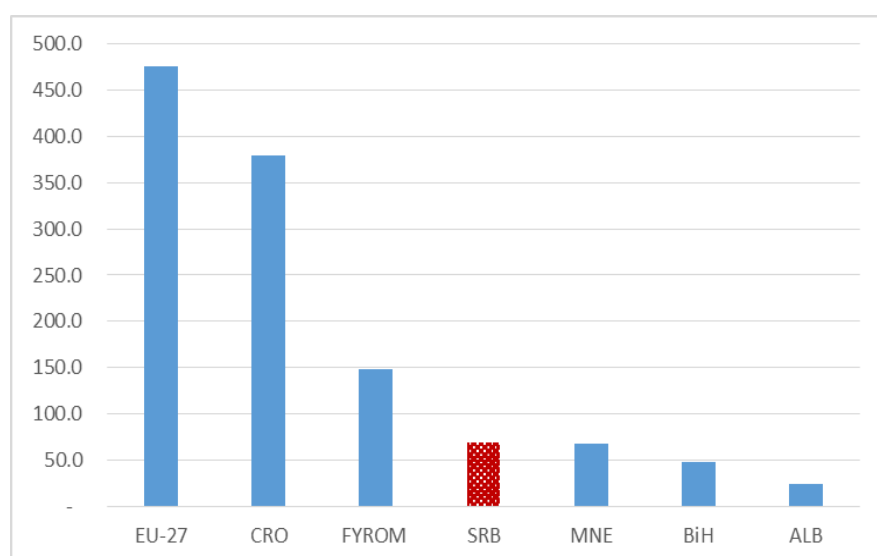
**An illustration: The important topics on agriculture policy discussed in media in 2015-2016:**

- Introduction of the Law on pre-sowing financing: increase in potential for credit financing
- Changes to the Law on Agricultural Land: flexible lease market (small and medium sized farmers allowed to lease additional 20ha), free-of-charge lease of land not used for 3 or more years, introduction of the possibility for long term (up to 30 years) lease of state-owned land, increase in fines for inefficient land management by municipalities
- New Decree on Subsidies for Plant Production: decline in the area payments from RSD 12 thousand per ha, to RSD 4 thousand (2 thousand per ha + RSD 2 thousand per ha for fertilizers)
- Introduction of the Payment Agency, which should facilitate disbursement of IPARD funds.

Generally, Serbia's agricultural policy mostly focuses on the input subsidies, output area and animal payments, while the share of rural development programmes in the total spending declined considerably (from 44% in 2006 to 7% in 2013), although these programmes are crucial for promotion of investments and farms restructuring, aimed at increasing productivity.

Although the relative amount of public spending on agriculture in Serbia is not low, due to difference in relative prices and the size of GDP, the absolute amount of public spending on agri-sector per hectare of utilized agriculture are in Serbia (69 EUR/Ha) is considerably lower than the EU-27 average (476 EUR/Ha), as well then in some of the countries comparable in terms of size and development, such as Croatia (379 EUR/Ha) and FYR of Macedonia (148 EUR/Ha). At the same time, public spending on agri-sector in Serbia, per hectare of utilized land is considerably higher than in Bosnia and Herzegovina and Albania, being close to the amount in Montenegro (Figure 2).

This suggests that public spending for support to agri-sector in Serbia is sufficient to maintain competitiveness of Serbian farmers in the CEFTA region<sup>1</sup>, but not in the European market, since the support is lower, while through implementation of the Stabilization and Association Agreement, Serbia has almost fully liberalized its agri-sector market with respect to the farmers and companies from the EU member states.



**Figure 7.** Public Spending on Agri-Sector, EUR/Ha of utilized agriculture area

Source: Agricultural Policy and European Integration in South-eastern Europe, FAO; Budapest, 2014.

Additional problem with regards to agriculture policy in Serbia relates to volatility and unpredictability of the support programs. Namely, the total budget allocation to agriculture support programmes has been considerably varying, so the total allocation in 2016 was by almost 30% lower than in 2012. At the same time, the forms and amounts of state support have changed several times in the last few years, while even within the programs, eligibility criteria and the amounts of support were subject to continuous changes (e.g. area payments in 2016 are scaled down from RSD 6 thousand to RSD 2 thousand per hectare).

<sup>1</sup> Central European Free Trade Agreement (Albania, Bosnia and Herzegovina, Kosovo\* (in line with UNSC 1244 and the ICJ Opinion on the Kosovo declaration of independence), Montenegro, Moldova and Serbia).

Frequent changes to the agri-sector support programmes have negative implications on long-term planning and investments in farms and food processing.

In addition to the issue with the total amount of support and its volatility, Serbia's state support scheme to agriculture features has unfavourable structure. Namely, the area and animal payments account for 60% of total spending, input subsidies take 20%, producer subsidies - 15%, while the spending on general services related to extensions, research, animal breeding, plant and animal health, soil fertility control and border control, account for only 1-2% of the total spending. This suggests that the structure of the agri-sector support scheme is not designed in productivity-enhancing manner, since almost 80% of the support (area and animal payments and input subsidies) "reward" extensive use of inputs, instead of promoting their productive use.

Performances of state support schemes for agri-sector in Serbia are also affected by the design and efficiency of the administrative process related to application for funds and their allocation. For instance, the Farm Payment Agency (FPA) is still lacking the capacities for efficient registration and processing of large number of applications. In addition, some households are crowded out by the eligibility criteria for registration with the FPA (which have been changed several times in the past) – e.g. access to rural households is available only to farmers with the age below 65, at the same time being conditional on full payment of contributions to the Pension Fund, although many farmers do not participate in the pension insurance scheme.

## 5.2 Agricultural policy in Serbia: impact of the EU accession process

Approximately 40% of the *Acquis Communautaire* relates to agriculture, rural development and related topics, which is why the related programmes account for the large share of the EU budget. Therefore, EU accession process has a considerable impact on the agriculture policy of the country striving to join the EU. In that respect, negotiations on the Chapter 11 (Agriculture and rural development), Chapter 12 (Fishery) and Chapter 13 (Food safety), shall trigger substantial reforms in terms of: *i)* legal reform aimed at harmonization with the Common Agriculture Policy (CAP), especially with regards to direct payments, common market, rural development and financial rules; *ii)* Development of implementation capacities, which implies reform of the institutions in charge for implementation, and in some cases formation of the new institutions; *iii)* Economic reforms aimed at improving competitiveness of the agriculture and food processing chain, and improving the capacities of rural households to earn alternative income.

Through the EU accession process the future member state is preparing to be able to implement all the CAP elements after joining the EU, which means that the country may opt/negotiate on the speed of harmonization before the formal accession occurs.

In order to facilitate the reform of agriculture policies and its harmonization with the CAP, the EU provides Instruments for Pre-Accession Rural Development (IPARD) funds to the pre-accession countries, which is a direct way of influence of the EU accession process on the agriculture sector in Serbia. Country's performance in terms of implementation of the IPARD program is at the same time perceived as the test for its capabilities to undertake all obligations and comply with the CAP. Main objectives of the IPARD programmes are:



- Improvement of competitiveness of the agriculture and food sector, its restructuring and modernization;
- Assistance with implementation of the veterinary, phytosanitary, food safety and environmental standards stipulated by the EU legislation;
- Support to organic farming and environmental-friendly practices in agriculture, aimed at enhancing sustainability of land management
- Supporting the rural development, by means of diversification of economic activities in rural areas and strengthening the link between the rural economy and development actions - LEADER approach (Liaison Entre Actions de Developement de l'Économie Rural)
- Supporting development of capacities for efficient implementation, monitoring, evaluation, and publicity of the programmes.

The total IPARD assistance to Serbia from 2014 to 2020 shall amount to EUR 175 million, divided into six components (Table 5), the vast part of funds being allocated to investment in farmers' physical assets and investment in physical assets related to marketing and processing of agri-sector products. These programmes should be co-financed from the national budget (EUR 54.9 million), so the total amount to be available for implementation of IPARD programme in this period shall amount to EUR 229.9 million (0.8% of GDP).

**Table 5: IPARD programme for Serbia, 2014-2020 (EUR million)**

	<i>EU budget</i>	<i>National budget</i>	<i>Total</i>
Investment in farmers' physical assets	76.0	25.3	101.3
Investment in physical assets related to marketing and processing of agri-sector products	62.2	20.7	82.9
Agri-environment-climate and organic farming measure	8.8	1.5	10.3
Implementation of local development strategies	5.3	0.6	5.9
Farm diversification and business assistance	17.5	5.8	23.3
Technical assistance	5.3	0.9	6.2
<b>TOTAL</b>	<b>175.0</b>	<b>54.9</b>	<b>229.9</b>

Source: Republic of Serbia IPARD Programme 2014-2020, Ministry of Agriculture and Environment Protection

IPARD programmes may play important role in improvement of competitiveness of Serbia's agriculture sector, because it implies effective increase in the total financial support to the agriculture sector by approximately 0.1% of GDP every year, which means effective increase in state support to agriculture by approx. 10%. Additional benefit comes from the fact that the IPARD programmes are targeted to some of the key bottlenecks of Serbia's agriculture, such as modernization of equipment, farm diversification, etc. Although IPARD funds should be available in the period 2014-2020, their effective use has not started by the end of 2016, due to technical and organizational issues with regards to implementation. In order to use this opportunity effectively, Serbia would need to reinforce activities related to development of institutional capacities for implementation of IPARD programme.

### 5.3 Determinants of financial position of farms in Serbia – econometric analysis by sectors

The following econometric analysis of financial position and performance of farms in Serbia is based on panel data models. The estimation is conducted for sectors of cereals and fruit growing in period 2014-2015 (the structure of samples by sectors and regions is presented in Table 1).

**Table 6:** Structure of farm samples in Serbia by sectors, 2014-2015

Sector	Number of farms			
	Vojvodina	Central Serbia	Total	Total panel observations (2014-2015)
Cereals	220	99	319	638
Fruit	14	40	54	108

The following variables are used as potential factors of financial position of farms In each observed sector: (1) total output (SE131), total intermediate consumption (SE275), balance of subsidies and taxes (SE600), depreciation (SE360) and total external factors value (SE 365). The choice of mentioned factors is determined by the availability of data on sector level. Initial panel data model is of the following form:

$$NI_{it} = \beta_1 + \mu_i + \lambda_t + \beta_2 TO_{it} + \beta_3 IC_{it} + \beta_4 Sub_{it} + \beta_5 Depr_{it} + \beta_6 EF_{it} + u_{it} ;$$

$$i = 1, \dots, N_j; \quad t = 1, 2, \dots, T$$

where:  $N_j$  – number of farms in sector  $j$ ;  $t$  – observed year,  $NI_{it}$  – dependent variable (Farm net income),  $TO_{it}$ ,  $IC_{it}$ ,  $Sub_{it}$ ,  $Depr_{it}$  and  $EF_{it}$  –total output, total intermediate consumption, balance of subsidies and taxes, depreciation and total external factors value of farm  $i$  in year  $t$ , respectively. Error term of panel data model is denoted as  $u_{it}$ , whereas  $\mu_i$  are  $\lambda_t$  representing individual (farm) and time effects. Differences in farm income across farms are captured by individual effects, whereas its time dynamics by time effects.

Since regressors in observed model are in fact components of farm net income (dependent variable) and these regressors themselves could also be correlated, high multicollinearity problem could be expected. Consequently, the effects of regressors would not be estimated separately.<sup>2</sup> The mentioned problem is confirmed in the model of crop farming using usual econometric criteria.<sup>3</sup> According to these criteria, potential sources of multicollinearity problem in panel data model are two regressors: intermediate consumption and external factors value. Following the results of further analysis (Variance inflation factor), variable intermediate consumption is dropped from the model as the most important source of multicollinearity (correlation matrix and partial correlation coefficients are presented in Table 2, Column (7)).

<sup>2</sup> For instance, regression coefficient of one determinant (e.g. intermediate consumption) may contain the effect of some other determinant in the model (e.g. external factors value) if the two determinant are highly correlated. Then, regression coefficient estimates depend on exclusion of some regressors from the model (their sign and significance could change).

<sup>3</sup> For instance, Variance inflation factor (VIF), preliminary correlation analysis (correlation matrix in Table 2), auxiliary regression of each regressor on other regressors, etc.).

**Table 7:** Correlation analysis

Correlation matrix							Partial corr. coefficient (p-value)
	<i>IN</i>	<i>TO</i>	<i>Sub</i>	<i>IC</i>	<i>Depr</i>	<i>EF</i>	
<i>IN</i>	1.0000						
<i>TO</i>	0.7351	1.0000					0.9323 (0.000)
<i>Sub</i>	0.1496	0.2679	1.0000				-0.0572 (0.150)
<i>IC</i>	0.3807	0.8946	0.3521	1.0000			
<i>Depr</i>	0.2518	0.6575	0.2157	0.6753	1.0000		-0.8324 (0.000)
<i>EF</i>	0.3762	0.8756	0.2515	0.9151	0.6468	1.0000	-0.5167 (0.000)

In order to choose the appropriate specification and estimation method, several tests are conducted and some of the results are presented in Table 8.

**Table 8:** Testing results

Test	Test statistics
<b>Breusch-Pagan heteroscedasticity test</b> (pooled model)	277.64 ( <i>p-value</i> = 0.000)
<b>Individual effects:</b> F test (fixed effects model)	3.78 ( <i>p-value</i> = 0.000)
BP test (random effects model)	49.53 ( <i>p-value</i> = 0.000)
Honda test (random effects model)	7.04 ( <i>p-value</i> = 0.000)
<b>Hausman robust misspecification test</b>	58.244 ( <i>p-value</i> = 0.000)

Test results indicate that pooled model is not appropriate since it produces inefficient estimates of regression parameters due to heteroscedasticity problem as well as due to significant individual effects. Tests for individual effects confirmed significant variability of intercept term across individuals (farms), and hence these effects have to be encompassed by panel data model. Moreover, Hausman misspecification test indicate that individual effects could be treated as fixed. Since heteroscedasticity also exists in fixed effects model, robust version of Hausman test is used. As the analysis is based on only two-year period (as a minimum for panel data analysis), time effect is included in model as fixed parameter. Results of alternative fixed effects specifications with robust standard errors are presented in Table 9.<sup>4</sup>

Along with the effects of regressors on farm net profit in crops farming, the starting model (1) also captures different impacts of those factors in two regions (Vojvodina and Central Serbia), and changes in these effects over time. Namely, relevant interactions for regions are included (*TO\_r*, *Sub\_r*, *Depr\_r*, *EF\_r*), as well as interactions of the regressors over time (*TO\_15*, *Sub\_15*, *Depr\_15*, *EF\_15*). Estimation results indicates that there are no significant differences across regions and over time in each determinant effects on farm net income (e.g. insignificant regression coefficient of interaction *TO\_15* is -0.026, which is the slope change in 2015). Model (2), including only interactions across regions, also indicates insignificant differences in determinants effects on net profit between two regions. Therefore, final results imply the same effects of regressors on dependent variable over time and across the regions. According to the final model (Table 9, model (3)), three of four determinants have significant impact on net income. Expected

<sup>4</sup> Due to heteroscedasticity problem even in fixed individual effect model, the estimation of robust standard errors is needed.

influence of subventions on net income in crop farming is positive, which is confirmed by estimation result (regression coefficient 0.322), but that impact is not significant.

**Table 9: Fixed effects specifications - estimation results**

Dependent variable: farm net income in crop farming sector

Regressor	Fixed effects model with robust standard errors		
	(1)	(2)	(3)
<i>TO</i>	0.984***	0.998***	1.004***
<i>Sub</i>	0.852**	0.259*	0.323
<i>Depr</i>	-0.824***	-0.965***	-0.736***
<i>EF</i>	-2.118***	-1.836***	-1.829***
<i>TO_r</i>	0.043	0.006	
<i>Sub_r</i>	0.209	0.763	
<i>Depr_r</i>	0.288	0.451	
<i>EF_r</i>	0.109	0.111	
<i>TO_15</i>	-0.026		
<i>Sub_15</i>	0.759		
<i>Depr_15</i>	-0.149		
<i>EF_15</i>	0.371		
<i>d_2015</i>	-269499.30**	-170651.9**	-195158**
Constant	-2080525.00***	-2170863***	-2226104***
R <sup>2</sup>	0.838	0.817	0.802
F test	338.84***	466.67***	223.94***

\*\*\*, \*\* and \* significant at 1%, 5% and 10% significance level, respectively.

Panel data specification defined in cereals sector is also used in estimation of the farm net income determinants in fruit growing sector. Similarly to the model in crop farming, the results in this sector also indicate the multicollinearity problem and the main sources of high multicollinearity are intermediate consumption and external factors value. According to VIF criteria, external factors value variable is dropped from the model. This also coincides with the fact that the fruit growing is a sector in which the external factors value effects (particularly, rent paid) is not expected.

**Table 10: Correlation analysis**

Correlation matrix							Partial corr. coefficient (p-value)
	<i>IN</i>	<i>TO</i>	<i>Sub</i>	<i>IC</i>	<i>Depr</i>	<i>EF</i>	
<i>IN</i>	1.0000						
<i>TO</i>	0.5302	1.0000					0.9772 (0.000)
<i>Sub</i>	0.0531	0.4763	1.0000				0.6132 (0.000)
<i>IC</i>	0.1211	0.7348	0.7828	1.0000			-0.8607 (0.000)
<i>Depr</i>	-0.7011	0.1680	0.2369	0.2765	1.0000		-0.9836 (0.000)
<i>EF</i>	0.1166	0.7520	0.6825	0.8313	0.319	1.0000	

Starting with pooled, fixed and random effects models, panel data testing procedures are conducted and some of the results are presented in Table 11.

**Table 11: Testing results**

Test	Test statistics
<b>Breusch-Pagan heteroscedasticity test</b> (pooled model)	6.12 ( <i>p-value</i> = 0,0134)
<b>Individual effects:</b> F test (fixed effects model)	3.94 ( <i>p-value</i> = 0,000)
BP test (random effects model)	12.90 ( <i>p-value</i> = 0,000)
Honda test (random effects model)	3.59 ( <i>p-value</i> = 0,000)
<b>Hausman robust misspecification test</b>	9.760 ( <i>p-value</i> = 0,0447)

All tests indicate significant individual (farm) effects, i.e. intercept variability across farms, and heteroscedasticity problem as well. According to the Hausman robust test result, final model is in the form of fixed effects with robust standard errors (estimation results are given in Table 12).

**Table 12: Fixed effects specifications - estimation results**

Dependent variable: farm net income in fruit growing

Regressor	Fixed effects model with robust standard errors	
	(1)	(2)
<i>TO</i>	1.0710***	1.0441***
<i>Sub</i>	0.9497	0.7637**
<i>Depr</i>	-1.0156***	-1.0019***
<i>IC</i>	-1.6746***	-1.7234***
<i>TO_r</i>	-0.18298 ***	0.1263**
<i>Sub_r</i>	-0.4787	
<i>Depr_r</i>	0.01507	
<i>IC_r</i>	0.7176*	
<i>TO_15</i>	-0.0249	
<i>Sub_15</i>	0.3652	
<i>Depr_15</i>	0.0311	
<i>IC_15</i>	0.0963	
<i>d_2015</i>	30075.22	134704.8**
Constant	-88468.08	397935.0*
R <sup>2</sup>	0.9785	0.9719
F test	6867.56***	19743.33***

\*\*\*, \*\* and \* significant at 1%, 5% and 10% significance level, respectively.

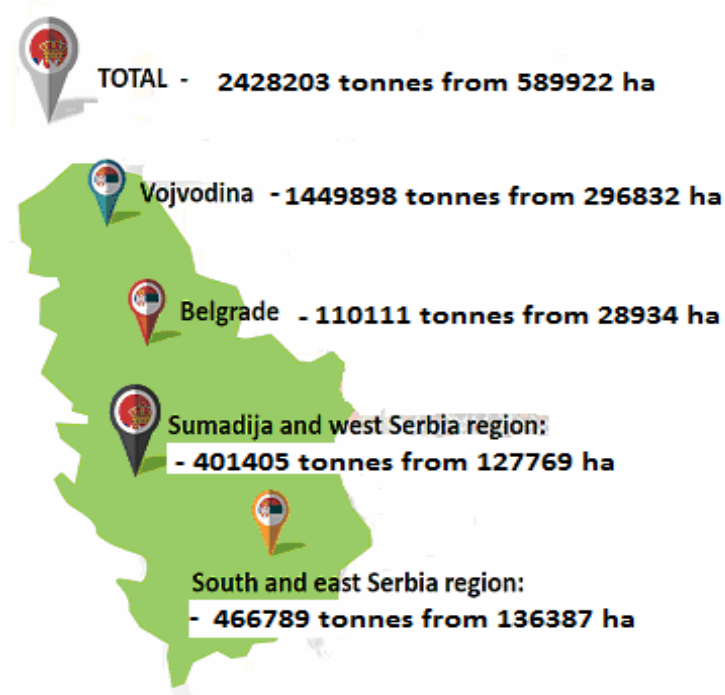
The results of estimation and testing procedure in fruit growing indicates there are no significant different determinant effects in two years (insignificant regression coefficient of interaction variables (*TO\_15*, *Sub\_15*, *Depr\_15*, *EF\_15*)). Hence, these interactions are dropped from the further estimation procedure.

According to the final estimation results of fixed effects model with robust (Table 12, model (2)), there is significant positive impact of total output of fruit growing farms and this effect on net income is less in farms of Vojvodina than in Central Serbia (regresion coefficient of variable *TO* in Vojvodina: 1,0441 and in Central Serbia is: 1,0441+0,1263=1.1704, significant on 1% and 5% level, respectively). The effects of subventions are also positive and significant at 1% significance level.

## 6 Serbia Case Study A: Wheat production in Vojvodina Region

### 6.1 Case study introduction

The value of agricultural production in Serbia has been led by plant production, with a multi annual average of around 68%. Exports are dominated by cereals (17.3 %), and followed by fruit (17.1 %). Vojvodina is a NUTS3 region, a distinct political and administrative entity, and take place in the north part of Serbia, comprising 28% of the total land area of Serbia and 26% of the total population. This is predominantly rural area with fertile arable land and intensive agricultural production. Most of farms are small, with an average size up to 10 ha. The farmers are mainly land owners and the biggest farms with an over 100 ha, are rare and usually corporately owned.



**Map 2. Wheat production (t) and shown area (ha) in Serbia, 2015.**

*Source: SORS database*

Wheat is a strategic product in Serbia - it is used as a main raw material in bakery industry, whose products are widely used in human nutrition. There are large fluctuations in wheat yields per ha and areas sowed with wheat by individual years. They are caused by the weather conditions in individual years and consequently the stock prices. In spite of the seasonal fluctuations in wheat production, wheat is one of the major agricultural crops in Serbia.

High volatility in terms of yields may be the consequence of weak implementation of the agro-technical measures and low irrigation rate. Namely, out of the total arable area in Serbia of 3.3 million hectares, only

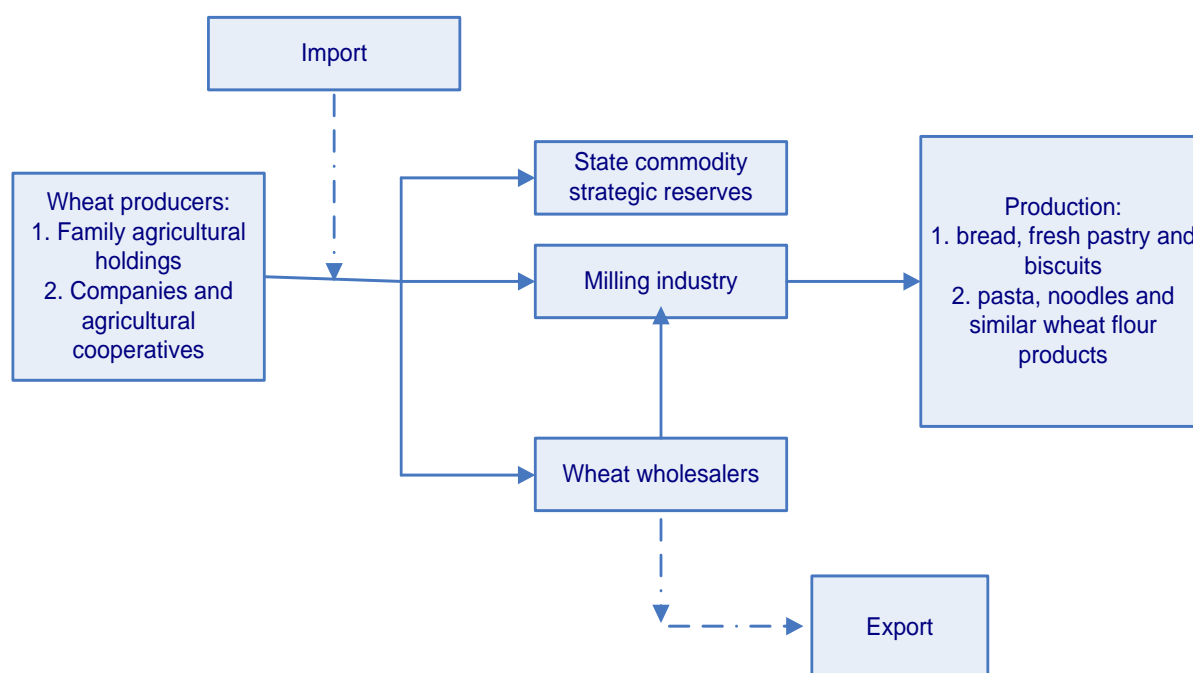
86 thousand hectares is irrigated, so the irrigation rate of 2.6% is by more than two times lower than the average irrigation rate in the Eastern Europe (5.4%) and by 3.5 times lower than the Europe average (9.3%). Lower irrigation rate in Serbia is not the consequence of lack of water, but rather the consequence of underinvestment in irrigation systems, due to domination of other (non-investment) subsidies programmes in public spending on agriculture.

**Table 13: Agricultural land, arable land and irrigation area (1,000 ha)**

Region	Agricultural area	Arable land	Irrigation area	Irrigation area / Arable land
Serbia	5069	3299	56	2,60%
Eastern Europe	314100	194118	10458	5,40%
Europe	469910	277141	25880	9,30%

Source: FAO database

Volatility of the total production of wheat is slightly higher than the yields volatility, suggesting that also changes to the amount of land planted with wheat contributes to high volatility of wheat production. This may be due to shift to production of other crops, but also due to relatively low land utilization rate. Namely, according to the estimates, approx. 400 thousand hectares of agricultural land in Serbia is not planted. This is often due to unresolved ownership rights (e.g. due to long lasting inheritance processes, out-of-dated land registry, etc.), but also due to low direct costs related to ownership over land (low property tax and low income tax on incomes from farming).

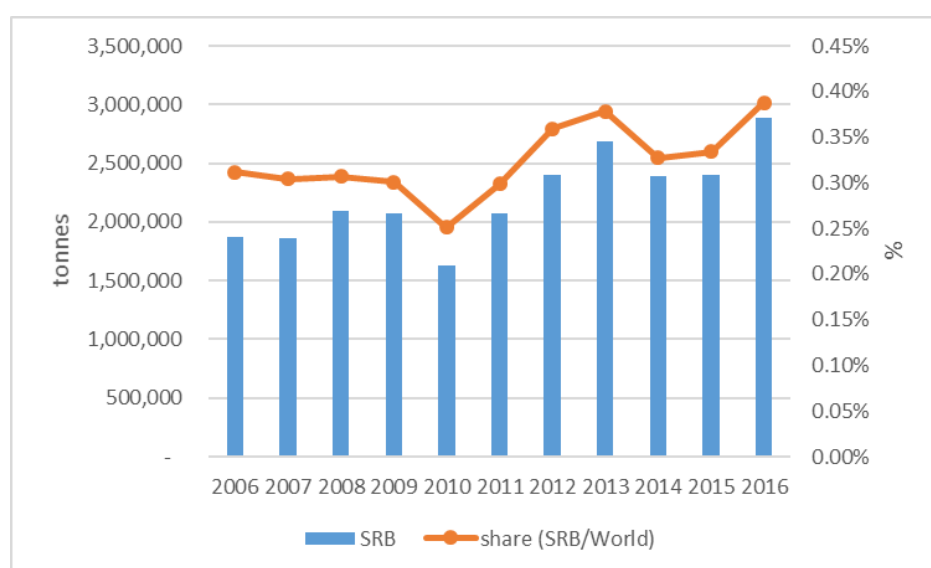


**Graph 2. Wheat value chain in Serbia**

Crop production predominates because of the region's fertile soils, good growing conditions, and high proportion of arable land (82.3% of land area). Producers in this region are more market-oriented than in the other regions. There is developed of certain vertical product integration between farm owners and agricultural production on one side, food industry on the other side and grain merchants, transporters and retailers between them.

Given the capacities, better technical equipment, significantly higher average yield, the target population are farmers with high capital requirements. They are high capital- intensive producers with more than 100ha, which have more than 50% of observed market. They shape the current wheat supply chain, have possibility to invest in the production process and the acquisition of new equipment and technology. They might be able to trade on the exchange or use different risk management tools. On the other hand, although these are big market players, there are number of issues regarding finance and credit.

There are two types of wheat producers in the Republic of Serbia – individual producers, i.e. family agricultural holdings, and companies and agricultural cooperatives. Areas sowed with wheat and the yields differ considerably between these two types of producers. Proportion of each of these two types of producers is different in the northern and the southern parts of Serbia. Figure 8 shows the total wheat production in tons.



**Figure 8. Wheat production in the period 2006-2016**

Source: SORS and own calculations

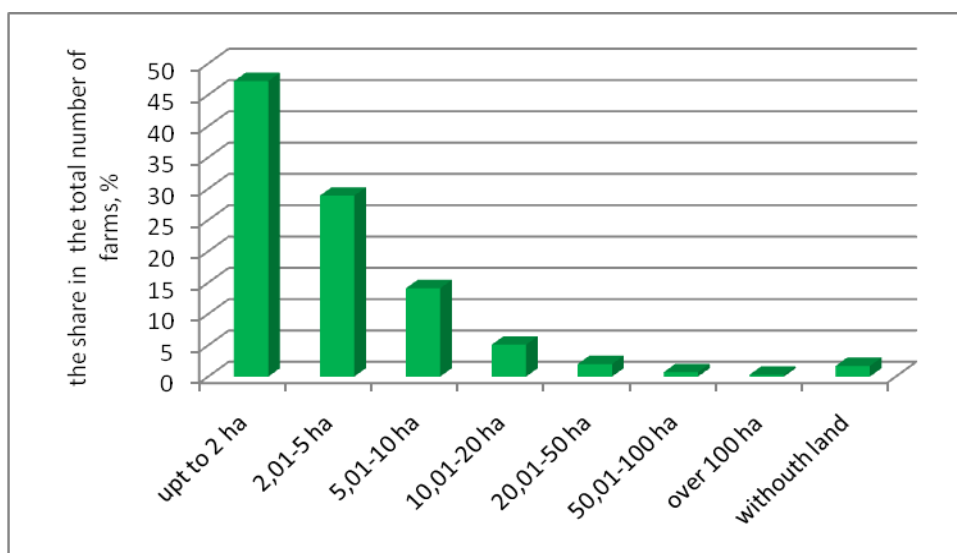
There are large fluctuations in wheat production and yields due to many factors. In spite of these fluctuations, some regularity can be noticed. Companies and agricultural cooperatives produced 21% to 24% of the total wheat yields in Serbia. In the northern parts of Serbia their share accounted for 33% to 37%, and in the southern parts of the country it accounted for 1% to 6%. This clearly indicates that family agricultural holdings are the major wheat producers, especially in the southern parts of Serbia. Weather conditions in 2013 were very favourable for agricultural production. According to the SORS data, the total wheat yield in 2013 was 2,678 thousand tons, which is by 40.2% higher than in 2012, or by 36.3% above the ten-year average. This is because a larger area was sowed with wheat, by almost 17%, and the yields were higher, by almost 20%. Average yields per hectare obtained by companies and agricultural cooperatives were by 32% to 43% higher relative to family agricultural holdings. Generally, wheat production yields in Serbia are considerably above the World average, by 10% to 30%, and, wheat production yields in Serbia exhibit high volatility. As for the production distribution by the region, yields per hectare are higher in the northern region than in the southern parts of Serbia, and this disproportion is especially noticeable in yields obtained by family agricultural holdings. This disproportion is less noticeable in yields obtained by companies in these two regions. The major wheat producers in Serbia are wheat producer association Vojvodina Agrar, Matijević Company, Raca Zrenjanin etc.



The total number of farms in Serbia is 631.552, among which dominate small farms with less than 2 ha and very small share of large farms (the farms with more than 20 ha occupy only 3% of the total number of farms). The average economic size of agricultural holdings amounted to 5.939 euros (4.990 euros in the sector of private farms and 204.755 EUR in the sector of legal entities and entrepreneurs). The average economic size of agricultural holdings defines the dominant sector of family farms, given that this sector accounts for 99.5% of the total number of farms in Serbia. According to Eurostat, the average economic size of agricultural holdings in EU-28 (data for 2010) amounted to 25.128 EUR, which is more than four times the value of this indicator for the Republic of Serbia

This is the result of a historical process in the period after the Second World War, as well as the specific legal framework which concerned parcelling of land. Considering the ownership, the largest part of agricultural land in the Republic of Serbia is in the hands of small private possessors, while corporate ownership still is represented by very small share.

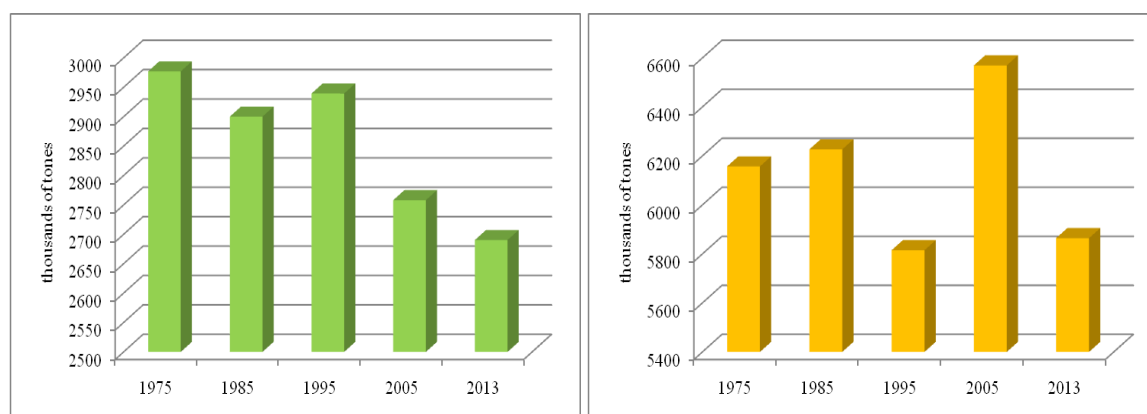
The distribution of the total utilized agricultural area in Serbia reflects the mentioned structure of the agricultural sector: the agricultural households up to 2 ha take the biggest share in the total number of farms (over 45%), and it rapidly decreased towards bigger farms (less the 1% of the total number of the farms).



**Figure 9.** Agricultural holdings by the utilized agricultural area, 2015

(Source: Statistical Year Book of the Republic of Serbia 2016, SORS, Belgrade, 2016)

Such structure of the agricultural sector produced certain volume of agricultural production which fluctuated over the years caused by combination of natural and socio-economic factors. Such fluctuations in crop production in Serbia are not uncommon, and usually driven by some outside factors (unfavourable climate conditions, general uncertainty of production that farmers are faced with within our market is the consequences of the still undeveloped market mechanisms and the most often chosen strategy by individual producers – the strategy of diminishing risk through diversification of production).



**Figure 10. Production trends of (a) wheat and (b) corn in Serbia in the period 1973-2013**

(Source: SORS, 1973-2014)

However, the distribution of the production throughout the sectors remained about the same (about two-thirds of the total production is plant production, and the remaining one-third is the livestock production).

Analysing certain sectors during last few years, the change was more visible: crop production decreased, with only exception of the wheat production which had slight growth of 1.7% in the 2015, and significantly bigger growth in 2016 of 18.8%. In the 2015, only fruit sector increased by 2.3%, but analysing certain sort of fruit, raspberry production decreased in 2016 by 6.5%.

Wheat market in Serbia is largely liberalized, and although there is not official commodity exchange, the prices are set on the basis of demand and supply. There has been noted a price disparity between wheat and its inputs, primarily NPK fertilizers and to a smaller extent fuel. Growing price disparity is reflected in reduced accumulative and reproductive capability of private farmers (Tomić Danilo, Vlahović Branislav, Maksimović Branka, 2010, Price Parities of Chosen Inputs and Basic Agricultural Products in Serbia, Škola Biznisa, Vol. 47, No. 1, pp. 57 - 66). Widening price disparity between wheat and its inputs caused decline in wheat producers' profits. Some research results showed that family agricultural holdings requested yields of 3.58 tons per hectare to cover only variable costs (government subsidies and incentives were excluded), and the profit-breaking point was created at 7.58 tons per hectare. (Todorović Saša, Filipović Nikola, 2010, Economic Analysis of Wheat Production on Family Farms, Journal of Agricultural Science, Vol. 55, No. 1, pp. 79 – 87). The results of 2012 Census of Agriculture illustrate small accumulative capability of family agricultural holdings in producing wheat.

Generally, favourable climatic and geographic conditions, as well as traditional production structure, make Serbia a self-sufficient in wheat produce. When yields are low (due to adverse weather conditions) the government often decides to impose temporary ban on export rather than import wheat. Table 15 shows the trends in amount and value of imported wheat in the period 2009-2012.

**Table 14: Wheat import in the period 2009-2012**

	2009		2010		2011		2012	
Variety	Tons	000 usd	Tons	000 usd	Tons	000 usd	Tons	000 usd
Spelt and meslin seed	33	14	142	117	537	426	1102	75
Common wheat	52	13	448	105	58	19	246	71
Durum wheat	340	133	87	70	125	92	220	135
Durum wheat other	305	47	95	22	379	170	877	354
<b>Total</b>	<b>730</b>	<b>207</b>	<b>772</b>	<b>313</b>	<b>1089</b>	<b>709</b>	<b>246</b>	<b>1357</b>

Source: SORS

Wheat import in all analysed years was minor relative to domestic production, i.e. it accounted for 0.01% to 0.13% of domestic production. A slight rise in wheat import was recorded in 2012 due to draught and poor yields. Experimental wheat varieties and durum wheat (in bordering areas) are usually imported.

The Republic Directorate for Commodity Reserves plays a special role in Serbian wheat market. It intervenes in both supply and demand. The Directorate intervenes in supply when wheat supply is small and could cause wheat price skyrocket and jeopardize business operations of milling companies. End February 2012 the Republic Directorate for Commodity Reserves put 75,000 tons of 2011 wheat crop on the market, which accounted for 3.6% of the annual production. On the other hand, it intervened in demand in the period July-September 2012. Although they were willing to purchase 100,000 tons of wheat for the strategic reserves, turnout of sellers was poor, so the Directorate purchased a bit more than 16,000 tons. Not many sellers were interested because the market price was higher than the price offered by the Directorate, due to poor 2012 crops. In 2012 the government purchased 0.84% of the annual crop (Commodity Exchange Novi Sad, 2012 Annual Report). Additionally, the Directorate for Commodity Reserves intervenes in wheat market by lending commercial wheat when supply is small. According to 2013 lending conditions, borrowers should return the wheat by a proportion of 1.15 kg to 1 kg, after sowing.

**Table 15: Milling industry production in the period 2010-2012 in tons**

Category	2010	2011	2012
Production	790167	821663	776227
Reserves	15713	18602	18642
Sales	757538	793834	752057

Source: SORS

The major participants in wheat market are milling companies. They have strategic importance in wheat value chain because they are the first level of wheat processing. Many of these companies are vertically integrated and have their own primary production, silos, manufacturing capacities and trade infrastructure. Wheat is a dominant raw material in milling industry, but other crops are processed, too. Table 4 shows the level of production, stocks and sale in milling industry in the period 2010-2012.

In the period 2010-2012 there were large fluctuations in the volume of production and sale of milling products due to changes in wheat supply and prices. Financial problems in Fidelinka, one of the major milling companies in Serbia, affected this sector of economy. Milling industry products are mostly inputs in production of food for humans, and to a lesser extent in fodder production. In spite of severe and fragmented competition in this industry (there is a mill in almost every town), several competitors stand out: Danubius, Fidelinka, Žitko Bačka Topola, Kikindski mlin, Žitobačka, Žitopromet, etc. The major milling industry customers are bakery companies, but also companies using flour to produce noodles, pasta and similar products. Much smaller portion of milling products is sold in retail stores to end users.

Wheat wholesalers are especially important in wheat value chain. Wheat wholesalers are companies specialized for this activity, or vertically integrated companies with primary production, silos and wheat milling. They provide primary producers with funds, goods (seeds, fuel etc.) and expert advice on sowing, free of interest, and the primary producers are obliged to return the borrowed assets either in the form of harvested wheat or money, under the currency clause. Primary producer credit is thus eased. Competition in this segment of the value chain is strong because about 250 companies export wheat from Serbia, which is favourable for primary producers. The major wheat wholesalers in Serbia are: MK Commerce, Victoria Logistic, Grain International, Komzum Novi Sad, Agroglobe, Agratrading itd. Fluctuations in wheat prices

during one year, but also over different years, bring profit to the wholesalers in the domestic market. Table 17 shows average annual wheat prices / 2002-2012.

**Table 16: Average wheat prices in the period 2002 – 2012 in RSD/kg**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Wheat	6,87	8,19	6,96	7,51	9,14	11,06	15,22	9,8	12,34	18,05	21,59

Source: SORS.

Data presented in Table 17 show that there were large fluctuations in wheat prices in the period. There was a gradual rise in wheat price as of 2009, and at the end of 2012 it reached the maximum of RSD 21.6 per kg. This change in prices is due to different weather conditions in individual years, areas sowed with wheat, and the volume of export. Wheat wholesalers are one of the major distribution channels of domestic wheat to foreign markets. Table 18 shows the amount and value of wheat exports.

Amount of exported wheat spanned a range between 206,780 tons and 427,179 tons. There were large fluctuations in wheat export which accounted for 10% of wheat production in 2009 to 26.2% in 2012. The value of wheat export spanned a range between USD 35,462 thousand and USD 97,626 thousand. Wheat is an important export item, and it accounted for 7.43% to 15.48% of the total cereal and cereal products export in the analysed period. The major wheat export markets are Romania, CEFTA states and Italy. Romania appears as one of the major wheat export markets because of the Port of Constanta where the largest world grain wholesalers have their subsidiaries (the largest 10 take up 80% of the world grain trade) and from which the purchased grain is transported worldwide. The largest portion of Serbian wheat sold to these companies ends up in the markets of Central Africa.

**Table 17: Wheat export (group 041) in the period 2009 to 2012**

	2009		2010		2011		2012	
	Tons	000 USD	Tons	000 USD	Tons	000 USD	Tons	000 USD
Spelt and meslin seed	4,814	1,412	65,113	16,791	11,481	4,718	71,508	23,955
Common weath seed							10,772	3,936
Common weath	186,302	31,089	324,025	64,382	275,106	82,584	169,158	49,715
Durum wheat	327	98	73	32	482	223	514	306
Durum wheat, other	15,338	2,863	37,967	8,347	36,350	10,101	64,968	16,894
<b>Total</b>	<b>206,780</b>	<b>35,462</b>	<b>427,179</b>	<b>89,552</b>	<b>323,419</b>	<b>97,626</b>	<b>316,920</b>	<b>94,806</b>

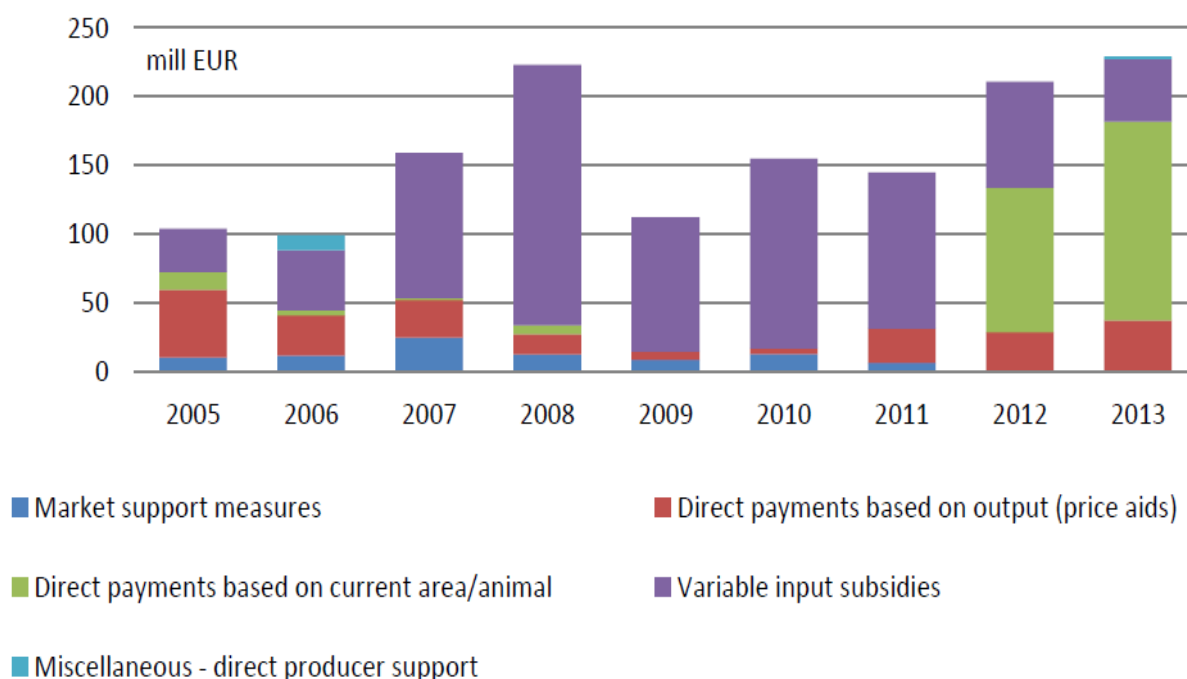
Source: SORS.

Wheat is a strategic product in Serbia because it is used as a main raw material in bakery industry, whose products are widely used in human nutrition. Although flour from other cereal grains is used too, wheat flour dominates. The government control in this sector is considerable, because the Directorate for Commodity Reserves, a government body, influences the wheat price, and indirectly the price of wheat flour, and in cooperation with the Bakers' Union of Serbia they set the maximum price for a loaf of white bread Sava made of wheat flour type 500.

## 6.2 Policy and regulatory conditions

### 6.2.1 Agricultural policy

Having in mind all previously mentioned characteristics of the agricultural policy in general, the analysis continues with specific measures that reflect the business conditions in the chosen sector. Particular attention is paid to the direct support to agricultural sector development, as the newest agricultural policy strongly relies on the direct forms of support.



**Figure 11. Market and direct support measures in Serbia**

(Source: Bogdanov and Rodić (2014): Agriculture and Rural Policy in Serbia, print in ed. T. Volk, E. Erjavec and K. Mortensen: *Agricultural Policy and European Integration in South-eastern Europe*, FAO, p. 163)

#### 6.2.1.1 Basic subsidies for crop production

About 2.2 million hectares are sown per year with grain and oilseed crops in Serbia. Roughly half of this area is dedicated to corn and a quarter to wheat. Soybeans, sunflower and sugar beets occupy most of the rest. All mentioned sub sectors are subject to the support programmes of basic subsidies for crop production.

Policy makers in Serbia often use conventional arguments to justify implementation of subsidies: the aim is to promote agricultural productivity through the adoption of new technologies. On the other side, the reduced costs of subsidised inputs increase farms profitability.

Orientation towards direct payments per area is reflecting the national policy's readiness to accept CAP practice. Direct payments were introduced in 2005, but later they were gradually reduced until they almost

disappeared. In 2012 and 2013 these measures were applied again, mainly in crop production (except for vegetables and fodder). The direct payments are not linked to compliance with basic standards concerning the environment, food safety, natural resource management and animal welfare. To some extent this reflects the incapability of policy makers to take radical steps and introduce measures which would be neither popular nor willingly accepted by producers.

The share of input subsidies has continuously increased over the analysed period. Since 2007 input subsidies have become a dominant scheme of budgetary support to agriculture, with their share of total agricultural budget exceeding 45% (in 2010 even reached 72 percent). However, the structure of input subsidies has changed dynamically, with a tendency to concentrate on diesel fuel and mineral fertilizers in the last few years. Frequent changes in the way these measures were implemented are what characterised this practice. For instance, early in the period, subsidies for diesel fuel were in the form of a flat rate payment per litre, while later they were calculated as the percentage of costs of purchased fuel up to the maximum number of litres per hectare. The modes of payment are also dependent on whether a farm is under or above 10 ha. Similar implementation models were applied in subsidizing fertilizers.

Together with credit and extension services, input subsidies were supposed to help farmers implement, benefit from and then, with the withdrawal of the subsidy, themselves fully fund economically and technically efficient input purchases and use: rapid learning with subsidies about input use and its benefits should mean that subsidies would be needed for only a short time and could be rapidly phased out. However, the systemic approach the agricultural policy in Serbia does not exist - year by year the policy instruments are exposed to significant changing. The subsidies on interest rates should be also added as a form of direct support.

#### **6.2.1.2 *Investment support***

The bank decisions on lending are based on the banks' risk assessments and their estimate of the clients "ability and willingness" to repay. Bankers make their credit decisions on the basis of the borrower's creditworthiness, taking into account the potential clients' business performance, historical data, market prospects and plans for the future. The problem often arises when family farms apply for credit. They are not obliged to keep business records and to make the financial reports at the end of the year. This significantly complicates the process of the credit analysis, and largely influences the final bank decision. In order to support mechanisms of lending a new model of credit support by the Ministry of Agriculture was introduced in 2010. The interest-rate subsidies are provided in order to encourage banks to lend to the sector. The Ministry of Agriculture facilitates very low interest rates to individuals, agricultural households and SMEs via a number of partner commercial banks. This model has been implemented since 2010. Serbian commercial banks are by far the largest formal lenders to agriculture, accounting for over 55% of the official sum of lending to the agricultural sector. This includes corporate and agribusiness SMEs lending, loans to registered farmers, as well as retail-type individual loans for agricultural purposes. Generally, banks offer a wide-range of loan products to the agricultural sector. All banks interviewed have a large number of agricultural loan products available that include, among other features, grace periods, trade contract collateralization, equipment finance and input credit.

## 6.2.2 Support to the public warehouse system

Every year, agricultural producers are facing the same challenges like preserving the quality of their goods, deciding whether to sell their produce immediately after sowing or store it, securing finances for the entire production process etc. The warehouse receipt system enables agricultural producer to keep his produce in a warehouse which provides guarantees that the produce will be safe, and that its quality and quantity will be preserved. At the same time, the warehouse receipt system gives a producer a freedom to choose when and at what price he is going to sell his produce. Agricultural producer is not forced to sell the goods in order to obtain money, since as long as the goods are stored in a public warehouse, he can obtain a short-term loan on the basis of warehouse receipts issued on the account of stored goods.

The Warehouse Receipt System represents a new concept of organizing production and handling agricultural products in Serbia. The system is based on the Law on Public Warehouses for Agricultural Products. This law was passed in 2009 and it stipulates licensing public warehouses by which only those warehouses that meet the high financial criteria and technical and technological performances associated with storing agricultural products are included in the warehouse receipt system. Since they operate on a licence, public warehouses guarantee a high quality of storing services and they issue a warehouse receipt which they are obligated to endorse at any given moment.

**Table 18: The advantages of the Public Warehouse System**

Farmer	Public Warehouse	Bank
<p><b>Good quality storage.</b> Agricultural producers are given an opportunity to store their goods in a high-performance storage facility and hence preserve the quality of their produce.</p> <p><b>Warehouse safety.</b> The risk of diminished quality or quantity of the product is reduced to a minimum, since, in the case of goods getting damaged in the warehouse, it is the Indemnity Fund that guarantees the compensation.</p> <p><b>Short-term loans.</b> With warehouse receipts, agricultural producers can obtain favourable short-term loans to finance the production process, until that process is completed, without having to pledge the goods or use mortgage as collateral.</p> <p><b>Subsidies.</b> Agricultural producers are given an opportunity to use subsidies for covering some of storing expenses and expenses</p>	<p><b>Higher revenue.</b> Public warehouses, that are included in the system, are given a licence which enables them to improve the storing quality and hence charge higher fees for storing services.</p> <p><b>More work.</b> The demand for licensed, high-quality warehouse space among potential depositors is much higher than for the unlicensed, smaller warehouses. Hence, it is in public warehouse's interest to become a part of the system and, by that, raise their competitiveness.</p> <p><b>Expanding business activities.</b> Licensed public warehouses are allowed to store state commodity reserves.</p> <p><b>Business sustainability.</b> A warehouse receipt, which a public warehouse issues based on the deposited agricultural produce, can be used as collateral for obtaining short-term loans.</p>	<p><b>New market niche.</b> Banks are getting a whole new market niche of loan users / farmers.</p> <p><b>Minimal risk.</b> Granting loans to this new market niche carries lower risk for banks, since the loan collateral here is the warehouse receipt, a high level of liquidity of deposited goods and the right to settle claims before other creditors via an out-of-court settlement.</p> <p><b>Possibility of using EBRD's credit lines.</b> The MAEP and the EBRD have signed an agreement which stipulates credit lines for banks that grant short-term loans to farmers based on the warehouse receipt.</p>

associated with obtaining a loan.	<p><b>Minimal risk.</b> The activities that public warehouses perform carry a minimal risk, since the Indemnity Fund guarantees that a public warehouse will honour its obligations towards the deponents.</p> <p><b>Subsidies.</b> According to the Ministry of Agriculture, Forestry and Water Supply's act, licensed public warehouses can obtain subsidies for purchasing required equipment like machines for fast measurement of protein content, thermometers and machines for determining the falling number.</p>	
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Source: <http://www.kompenzacionifond.gov.rs/index.php?page=24-the-warehouse-receipt-system>

Unlike privately-owned warehouses, which issue only a receipt note, public warehouses issue a warehouse receipt which is a form of a security that can be freely traded with. The warehouse receipt is issued to a depositor of agricultural goods / farmer, and this receipt enables the depositor to dispose of stored goods without ever having to have a physical contact with it. The simplest and most suitable way of using the warehouse receipt is to have a pledge on stored goods with the purpose of obtaining a short-term loan under favourable conditions. The Indemnity Fund guarantees safe dealings for all participants, and it is the Indemnity Fund that compensates for damaged stored goods, providing that the warehouse cannot indemnify the depositor. The state, i.e. the MAEP, financially supports the system via subsidies available to all participants. Additionally, procurement of the equipment for the rapid determination of wheat quality, moisture and protein content for the storage capacity over 10,000 tons is allowed by the Province of Vojvodina government. Wheat as one of the most important agricultural products in Serbia has a great value as a raw material for the production of flour, bread and pastries. Wheat must meet certain quality requirements. Therefore, it is necessary to set up devices that can quickly determine the quality of wheat, and farmers would get an opportunity for a better price in the market. Funds from this program are awarded for co-financing the procurement of devices for quick determination of the quality of wheat.

### **6.2.3 Advisory and technical services improvements in agriculture**

Under the policy of general measures and services related to agriculture the regular programs of the Ministry have been implemented including extension services, soil fertility control, pests and diseases management, forecast and reporting service, etc. The majority of resources under so-called general support measures related to agriculture were distributed throughout extension services. Agricultural extension in Serbia is provided by the semiautonomous Institute for Science Application in Agriculture (ISAA). This institution is partly financed by MAEP and additional income derives from agricultural activities and fees for services to private farmers.

Improvement in the advisory service providing is connected to a large extent with the R&D supported activities at the national and the EU level. Huge efforts are put on developing of a market-ready platform for agricultural advisory services. Its purpose is to serve to small farmers primarily. The Association of



Farmers of the Municipality of Ruma in Serbia (Region of Vojvodina) is included in the pilot project. The average UAA per holding in Ruma is 33 ha which corresponds to above average family agricultural holding size in Vojvodina. Totally 330 farmers are willing to improve their agricultural practices and adopt new technologies. The pilot case covers the entire crop production and the relative area of the crops (sowing structure) on the covered territory is: 50% maize, 20% wheat, 8% Soya, 6% vegetables, 5% fodder crops, 3% sunflower, 2.6% sugar beet, 2% permanent crops, 1% tobacco and 1% barley.

Other related activities supported at the national level have been connected with the advisory system improvement in the mentioned field and financed from the national budget for R&D: (1) Developing the software system for adjustment and analyses geodetic networks in surveying, Serbian Ministry of Science and Technical Development, 2008-2010, Project No: TR 16015; (2) Preparation of the methodology proposal for preliminary flood risk mapping in accordance to the Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks; Serbian Ministry of Science and Technical Development, 2009-2011, Project No: TR 22202; (3) Spatial, ecological, energetic and social aspects of settlement development and climate changes 4 mutual influence; Serbian Ministry of Science, 2011-2016, Project No: TR36035; (4) METEO package 4methodological/software solution for automated mapping of climatic variables , funded by the Ministry of Education and Science of the Republic of Serbia, 2014-2015.

**An illustration:** the expert opinion regarding the implementation of new tech solutions and its limitations in Serbia. The interview was conducted with the product/solution manager from GDi Solutions.

➤ *Is there an example of using GIS in Serbian agriculture, primarily in management of state agricultural land?*

GIS for the annual program preparation of the state agricultural land management was made for the needs of the Ministry of Agriculture and Environment of the Republic of Serbia. It is the system that covers the whole territory of Serbia, primarily for the needs of the state agricultural land management for which each municipality in the Republic is ought to create annual management program. The GIS enable the efficient overview of the state agricultural land which has been leased on various grounds in accordance with the law. In such a way, the Agricultural land management of the Ministry has the precise evidence about the resource that is under their jurisdiction (state agricultural land) as well as the information about the tenants and the way in which they dispose of the land.

➤ *What are the benefits of GIS usage for the state agricultural land management and what are the untapped potentials in general?*

The main benefit of GIS usage in this context is the possibility of comprehensive understanding of the important resource such as agricultural land. At one point, it is possible to overview which land is at disposal, which has been already leased and which is not used. It enables better land management to the owner, the state.

On the other hand, the untapped potential is the upgrading the system with the LPIS (Land Parcel Information System) which provides precise information about each parcel which is in the production system and on which basis all the other land management data has been processed. For example, it is possible to identify the exact area of the agricultural land which one producer in Vojvodina owned and from which he reap wheat yields or the exact area of raspberry parcels in the West Serbia region. Using GIS and remote sensing, it is possible to monitor all those areas considering the quality and the state of the crops or yields predictions, which is the first step towards precision agricultural system creation.

➤ *Is it possible to introduce the precise agriculture in Serbia?*

There are huge possibilities for introduction the precision agriculture in Serbia, no matter which product we are talking about. Modern technology and sensors connected through Internet of Things and put in the spatial context provide exact data for the exact location in real time. In such way the producers are able to manage their production in real time (they can see in which parts of their parcels there is lower humidity, in which part of soil the chemical composition is different or changed, where the plants are damaged so that certain treatment is needed, and etc. the information could be classify in different levels: parcel level, or even on the level of individual perennial plant.

➤ *What are the main obstacles in GIS introducing in the agriculture sector in Serbia?*

Practically, there are no obstacles. Agriculture is one of the economic activities which is the biggest space consumer and everything in agriculture depends of the space and spatial characteristics. So, almost all data and information are able to be spatially visualized. The only limit in GIS introducing in agriculture considers the size of agriculture holding – there is real objective concern if GIS is too expensive technology for small holdings?

## 6.3 Market conditions

### 6.3.1 Access to markets

Serbia exports high volumes of wheat and flour. Part of Serbia's wheat trade is shipped by truck to neighbouring Bosnia and Herzegovina, Montenegro, Macedonia and Albania, while the largest quantities of wheat are shipped by barge to Port Constanza, Romania. Serbian wheat is mostly sold to foreign international companies FOB at the Port on the Danube in Serbia. Serbian (higher quality) wheat is sold to Spain, Germany, Italy and France. Serbian wheat flour is mostly sold to Montenegro, Bosnia and Herzegovina, Kosovo, Macedonia and Albania. Serbian wheat shipped to the Black Sea is mostly stored in the Port of Constanza silos and shipped by sea vessels to North African countries (Tunisia, Algeria and Libya).

Serbia's wheat production is not competitive regarding quality and price with major export countries in the region such as Hungary and Ukraine, but it is very competitive in countries of former Yugoslavia such as the FYR Macedonia, Bosnia and Herzegovina and Montenegro (WORLD BANK, 2006). These countries have huge structural cereal deficits and they prefer Serbia as trading partner due to low trade costs and good political relations. Therefore, CEFTA1 members are Serbia's main trading partners. However, in the extreme situations (wheat price increase on the world market) policy maker reaction often causes direct export ban, which is harmful not only to farmers but also consumers in Serbia.

#### **Story about the wheat export ban from Serbia**

During world economic crisis (2008-2011) Serbian government restricted exports of wheat to world agricultural market aiming at countering the rise in food price inflation and protecting consumers from

higher food expenses.<sup>5</sup> Academic literature and public debates have criticized export restrictions as instruments for protection against high world market prices, notably because of their additional price-increasing effects on already high world market prices. And what did happen? The bread price in Serbia rather increased disproportionately during the export ban (> 50 %) which apparently cannot be traced to increased wheat or flour prices. Who are the winners and who are the losers? Profits generated during the anti-crisis policy by the milling industry were apparently much higher than profits attainable under free trade conditions. The bakery industry managed to increase bread prices and improve its profits. End consumers, in contrast, are the losers of this policy.

Source: Linde Götz, Ivan Djuric and Thomas Glauben: Are export restrictions an effective instrument to dampen food price inflation?, IAMO Policy Brief No. 10, March 2013.

In spite of the problems that are significantly impeding the process of integration of agri-food value added chains in the region, cooperation (both, bilateral and multilateral) in the sphere of agriculture continues its development due to its high potential and interest from all participants. The Black Sea Economic Cooperation includes 12 countries in the region.<sup>6</sup> This region is very important in the context of the wheat sector development in Serbia. One of the organization's major, strategic development projects is the joint transportation system. This project is very important in forming an international agri-food space. It will allow the creation of a single transport system in the Black Sea region. The creation of logistics and transport infrastructure will significantly simplify physical access to joint agri-food value-added chains and improve their effectiveness. (Borodina, 2014)

### **6.3.2 Land leasing**

The land-lease market in Serbia is currently more important than the land-sales market due to lacks of the proper legislative framework for the latter. The land market functioning is under the supervision and control of different mutually independent institutions: (1) The Government Geodetic Authority (GGA) manages the land cadastre. The cadastre, covering 88,167 km<sup>2</sup>, includes nearly 55 million cadastral parcels of private, social and state property. It is out-of-date and needs to be harmonised with the systems in the municipal courts; (2) The legal real property registration system, which complements the cadastre, is maintained by the municipal courts and supervised by the Ministry of Justice and Local Administration; (3) Rural and forestry spatial planning and land management policy is co-ordinated by the MAEP; (4) Property tax administration is the responsibility of the Ministry of Finance.

The lease market is characterised by insecure property rights and a relatively high lease tax that result in many lease transactions not being officially reported. Most of these transactions take place in the Region of Vojvodina with high quality soil. Due to unstable conditions, the land-lease contracts are often short-term

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<sup>5</sup> Nine countries around the world, including Serbia, restricted their wheat exports between which affected 14 per cent in world wheat trade (Cf. Giordani, P., Rocha, N., Ruta, M. (2012): *Food Prices and the Multiplier Effect of Export Policy*, CESIFO Working Paper No. 3783).

<sup>6</sup> The Organization of the Black Sea Economic Cooperation was founded on 1 May 1999 based on the Agreement for Black Sea economic cooperation of 25 June 1992. The BSEC Headquarters are located in Istanbul. The members of the organization are Azerbaijan, Albania, Armenia, Bulgaria, Greece, Georgia, Moldova, Russian Federation, Romania, Serbia, Turkey and Ukraine.

and do not encourage medium-term investment in the land or in the development of the farm infrastructure.

With the aim to improve land leasing, the amendments to the Law on Agricultural Land which came into force in December 2015 were adapted. These amendments significantly change the rules regulating lease of agricultural land owned by the Republic of Serbia. According to rules established by the Privatization Law, The Republic of Serbia has remained the owner of vast areas of arable agricultural land. The land owned by the Republic of Serbia is leased out to natural or legal persons after conducting the relevant leasing procedures before the authorities of local municipalities. Every agricultural producer (farmer), due to limited character of land as a fixed asset, has been interested in leasing as large an area of state-owned agricultural land as possible. However, the land market in Serbia still remains not functional; due to poor tended proprietary registers (institutional prerequisite for a good functioning land market is updated land registry which is not the case in our country). Additionally, in Vojvodina farmers have even resorted to physical altercations, blocking roads and similar methods in order to achieve the goal of leasing as much land as they can (derived from the public media sources and blogs). For example, the farmers often claim that they have been negatively affected by the actions in land leasing by municipalities which are denying them the right to purchase state-owned land under the same terms as big companies.

Additionally, for the purposes of the Provincial Department of Agriculture Vojvodina a geographic information system has been created and implemented. Originally, it was designed for monitoring and management of the state owned arable agricultural land. A geodatabase of the entire state owned land to the level of the cadastral parcel has been created. Beside the basic information about the land, the database also contains information about the status of the renting land, the history of the land use, yields, soil type, the use of grants and loans for a given parcel, etc. all this was initial for implementing next phases of the geographic information system in agriculture.

### **6.3.3 Land policy, natural hazards and insurance**

The territory of Serbia is vulnerable to various types of natural hazards and the agricultural risk is not equal across the entire territory; it varies depending on the type of hazard and the expected potential for damage. Due to the geographical position of Serbia, with territory situated along the southern part of the Pannonian plain and the Balkan Peninsula, and also due to the complex influences of various abiotic and biotic factors, diverse natural hazards are present.

**An illustration** (the expert interview with an Associate Professor at the Geographical faculty of University of Belgrade): "The most vulnerable area from the flooding aspect is northern part of Serbia (Vojvodina), where, in the coastal part of the Danube River (specifically, the Tisa, the Tamis and the Sava), there are about 12900 km<sup>2</sup> of potentially floodable land. Also, some parts of Vojvodina (north-eastern Bačka with northern Banat) are at the highest risk of drought. During the period from 1948–2007, 258 fires were registered just in the Deliblato sand (south-eastern part of Vojvodina), affecting 11921 ha. Although the 2014 floods were natural occurrences, the human factor also significantly contributed to the disasters."

Floods and torrential floods, as the most frequent phenomena among the "natural risks" in Serbia, need serious treatment. This treatment is accomplished through the following activities: (1) identification of the flood zones (whole watersheds or particular sections of rivers); (2) monitoring in real time (the water level

in the river bed and the amount of precipitation), along with a forecast and warning system; (3) short-term protection; (4) long-term protection; (5) land use; (6) risk management; (7) public participation, education and media.

According to the Law on Waters of the Republic of Serbia, each municipality is obliged to adopt two basic documents on flood control: the Plan of Identifying Erosion Regions and the Plan of Torrential Flood Control. The Plan of Identifying Erosion Regions identifies the areas with soil erosion hazard, present and future. Proper management is to be adopted by landowners. The plan also defines action for torrential flood control.

The Plan for Torrential Flood Control defines four stages of defence: Phase I – Preparation for torrential floods control (the most important stage as only a short time is available to react to torrential rainfall); Phase II – Extraordinary (emergency) flood control; Phase III – State of emergency; Phase IV – Clearing the detrimental impacts (Kostadinov et al. 2012).

For effective coordination and cooperation (important principles of natural hazard mitigation) public participation is required. Informing the local inhabitants on potential risks, timely information in the case of emergency, as well as active public participation in the defence or rescue actions are vital tasks, covered by Phase III.

The following measures of flood control and mitigation seem appropriate: (1) the implementation of a Decision Support System (DSS) for the optimal coordination of all flood prevention or mitigation activities and a telecommunication system to enable rapid response in the case of flood emergency; (2) the preparation of an inventory on risks for spatial and urban planning which identifies acceptable levels of risk; (3) The compilation of a new erosion map of Serbia based on the scientific analyses of rates of erosion; (4) Regular and continuous torrent erosion and complex of erosion control measures in watersheds. (Kostadinov 2007; 2010); (4) the preparation of Plans of Identifying Erosion Regions for each municipality in Serbia; (5) the preparation of Plans of Torrential Flood Control; (6) the compilation of an inventory of torrents for each watershed of Serbia; (7) the documentation of performed erosion and torrential flood control activities performed; (8) Real-time monitoring of rainfall and river discharge and to establish forecasting and early warning systems.

Along with the flood prevention system insurance is recognized as the traditional system for hazards control. Insurance of crop production in Serbia is voluntary. The basic risk is the hail risk, followed by the fire and thunder risks. Additional risks are the storm risk, frost risk and flood risk. Even though the agricultural sector as a sector of the Serbian economy vital for the social, ecological and economic development, the coverage of agricultural land by insurance, and the agricultural development generally, is extremely low.

The reasons behind such low percentage of insured arable land are the following: (1) ignorance of farmers about the benefits provided by insurance; (2) under developed agricultural production - low investments lead to lower income, which results in less households being insured and, consequently, with insurance relied on higher premiums.

**The illustrations - importance of insurance and problems in the practice:**

"Serbia has 3 437 232 ha of arable land, of which 2 536 882 ha is arable land, 187 300 ha under plantations and 713 342 ha consists of pastures and meadows. Since pastures and meadows are not insured by default, the important areas for insurers are the ones under arable fields and plantations - 2 724 182 ha. Approximately, only 9% of the above-mentioned surface is insured. Taking into consideration the annual production value is 3 to 3.5 billion EUR, we can see that there is a high risk, not only for the

producers, but for the budget of Serbia as well. If we take a look at the two most common crops in Serbia, wheat and raspberry, we can notice that in the last 5 years, only 25% to 30% of the territory planted with wheat and 4% to 10% of territory planted with raspberry was insured" (Insurance company expert)

"We only think about insurance when a large-scale natural disaster happened, which is a serious problem that needs to be discussed." (Insurance company expert)

Serbia has introduced subsidies for insurance premiums with the Regulation on insurance of animals, crops, fruits and young nursery perennial plants, which is a great stimulus. This regulation made registered farmers eligible for 40% reimbursements of the insurance premium. However, the results of these measures haven't been as successful as it was planned and did not increase the number of insurers. Based on all above mentioned, it is quite clear that the problem of agricultural development in Serbia needs to be approached in a serious manner, in order to stimulate farmers to insure their products. The obligation of the insurer is to offer an adequate product (covering more risks), with as simply defined insurance conditions and tariffs as possible, which will be beneficial to all, including farmers, government and insurance industry. It is clear that the second part of this work should be led by the country, through appropriate system of subsidies, models of public-private partnerships and the adoption of appropriate legislation in this area. There is room to introduce some of the elements of obligatory agricultural insurance.

#### **6.3.4 Food safety and food quality**

Competencies in the field of food safety in Serbia have been divided between MAEP and the Ministry of Health (MH). MAEP is responsible for veterinary, phytosanitary and food safety policies (the safety of food of animal origin, composite food, food of plant origin and feed). The ministry supervises the legality of work through its four directorates: Veterinary Directorate; Plant Protection Directorate; General Inspectorate and Directorate for National Reference Laboratories (DNRL). MAEP is central competent authority responsible for the organizations of official control and for ensuring efficient and effective coordination among all authorities and their directorates. Veterinary, phytosanitary and agricultural inspections are managed centrally but distributed territorially. In the Autonomous Province of Vojvodina (APV), the tasks related to food safety that fall under the competency of the MH have been conferred to the Secretary of the Health of the Province.

According to the Food Safety Law as from 2009 food business operators should implement Hazard Analysis and Critical Control Points (HACCP) principles in all establishments involved in the production of animal and non-animal food.

The issue of wheat quality and safety is debated from the technological point of view usually. For example, in the study Improvement of Wheat Quality in Cultivars Released in Serbia during the 20th Century twenty varieties of wheat were analysed, and the decreases in the protein and wet gluten contents were compensated for by an improvement in protein quality of wheat. Additionally, the increase in gluten structure stability and appropriate combinations of high molecular weight glutenin subunits have contributed to the improvement of other quality indicators. (N. Hristov, et al, 2010). However, the indicators of wheat quality are largely dependent on environmental factors.

The food safety issues and food quality are investigated and analyse separately from the agro-environmental issues. Agricultural practices show the significant soil contamination because of improper

use of manure while the erosion problem exists in many regions of Serbia. The agri-environmental policy advocates for the comprehensive evaluation of food safety issues in the context of protection of the environment from the so-called dirty technologies. However, due to lack of interest in the practice food safety issues and environmental protection have hardly taken place at all in Serbia up until now. Influence of food safety on the public health is a different topic which gains in importance. Particular attention is paid to mycotoxins in grains. Management practices to maximize plant performance and decrease plant stress can decrease mycotoxin contamination substantially. This includes planting adapted varieties, proper fertilization, weed control, necessary irrigation, and proper crop rotation. For post-harvest mycotoxin control, prevention of conditions that favour fungal growth and subsequent toxin production needs to be considered, i.e. factors such as water activity of stored products, temperature, and grain condition, gas composition of the intergranular air, microbial interactions, and presence of chemical or biological preservatives. Contamination of crops (either in production or post-harvest process) can influence also on the food safety in the down-stream industry (Milićević et al., 2010). Additional problems are related to lack of instruments and knowledge for food quality control and standards implementation. Instruments are often considered as expensive, while their cost is not assessed in relation to the value of testing the commodities or materials for the analysis of which the instrument has been purchased. (Pojić, et al, 2010)..

The first attempts to separate the wheat quality and to adequately evaluate producers' intentions to improve technology at the farm were conducted in the framework of The Warehouse Public Storage project implementation. The Ministry has prescribed and specific quality standards on the basis of which it had intended to subsidize farmers, depending on the technology and quality of the yield. Unfortunately, these attempts have remained unapplied in practice. Serbian wheat is usually produced and sold as the less quality product according to the international standards.

## 6.4 Key conditions faced by wheat producers

The key conditions are derived from the literature review and going to be discussed with the focus groups participants for the Wheat CS in Serbia.<sup>7</sup> The importance of selected conditions is already confirmed in the discussion with the experts selected for interviewing.<sup>8</sup> The key conditions faced by wheat producers are summarized in the table below:

	Key condition	Explanation
1	The unstable (constantly changing) institutional environment	The agriculture budget varied in size with clear indications of deviations in its structure from the EU model. Generally, trend of decreasing of budgetary expenditure for food sector and rural development in last five year exists. The largest part of the funds is still spent in direct support measures (mainly for input subsidies).

<sup>7</sup> The first conclusions are described.

<sup>8</sup> Totally five interviews with sector representatives were conducted.

2	Climate change	Climate change affects agriculture worldwide. Almost all countries in the region were significantly affected by the natural disasters such as floods, earthquakes, landslides, forest fires, droughts, heat waves, prolonged winter etc. Serbia has been especially exposed to floods.
3	Price fluctuation and market structure	The prevailing commodity groups in Serbian exports are cereals, fruits, beverages, fat and oils and sugar and related products. Crop prices have actually been permanently growing and influencing by high prices recorded in the international markets. Additionally, due the poorly organized privatization process disintegration of the value chain in Serbian agribusiness occurred, which has inevitably had adverse effects on the sector development. The traders and the food industry are highly protected from imports.
4	Demand - food security and food quality	‘Sensory appeal’, ‘purchase convenience’ and ‘health and natural content’ are rated as most important factors and ‘familiarity and ethical concerns’ are perceived as least critical in the region. There will be a further segmentation of the food market due to attention paid to diet and health. Generally, wheat for human consumption is estimated at 1 million MT annually with per capita consumption at 180 kg, which is significantly higher than consumption levels in most European countries. However, different issues occurred in the practice regarding the quality of wheat produced and traded both within the country and in the foreign markets.

## 6.5 Key strategies adopted by wheat producers and their impact on performance

In the following table the most commonly used/preferred strategies in risk control and mitigation in the Serbian wheat sector are summarized<sup>9</sup>:

	Key strategies	Explanation
1	Straightening of agricultural producers organizations	The weakest position in the Serbian food chain belongs to the farmers. They are unorganized, fragmented and left without adequate representation in different bodies responsible for governance. Even wheat producers who are larger than other agricultural producers on average

<sup>9</sup> The first conclusions are described.



		have faced with problems during harvest when the price of their product is underestimated. The role of LAGs and producers groups in bottom-up approach of decision making could be of crucial importance for the straightening of agricultural producers' position within the food chain.
2	Innovative insurance instruments and specialization	It is rare to find a farmer in Serbia who does not grow multiple types of crops, as land diversification is one of the most important risk-management strategies. To avoid the traditional approach towards farm sustainability, modern technology should be implied along with straightening of farms specialization. In these conditions different insurance instruments can be used. It is necessary to provide adequate incentives for farmers and at the same time to strengthen technical and financial capacities of insurers to take risks into their own coverage. Insurers are expected to offer appropriate and various products, tailored to the needs of the insured, with the widest possible coverage of risks, precise and as simple as possible defined conditions of insurance and accessible insurance tariffs. The new instruments could be related to the parametric index-based weather insurance.
3	The public warehouse system and innovative financial instruments	Agricultural producers are given an opportunity to store their goods in a high-performance storage facility and hence preserve the quality of their produce. The risk of diminished quality or quantity of the product is reduced to a minimum, since, in the case of goods getting damaged in the warehouse, it is the Indemnity Fund that guarantees the compensation. With warehouse receipts, agricultural producers can obtain favourable short-term loans to finance the production process, until that process is completed, without having to pledge the goods or use mortgage as collateral. Agricultural producers are given an opportunity to use subsidies for covering some of storing expenses and expenses associated with obtaining a loan. Additionally, based on the warehouse receipts, different commodity derivatives can be designed. The important role in the system implementation belongs to the exchange and knowledge transfer.
4	Innovation and technology improvement	The system of innovation must be oriented toward final implementation and associated with the practice. A pragmatic approach in the design of R&D activity involves the active participation of producers in the

		dissemination and implementation of achieved scientific results. Technology improvement is also connected with access to credit.
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## 6.6 The key strategies and the wheat sector performance - SWOT analysis

The following table illustrates the key internal strengths and weaknesses, as well as external opportunities and threats that influence the wheat sector performance and strategies applied in the practice:

<b>The strengths</b> <ul style="list-style-type: none"> <li>➤ The sector is self-sufficient.</li> <li>➤ Serbia is wheat exporter.</li> <li>➤ The new institutions (rather weak at the moment) can significantly influence position of wheat farmers in the future: public warehousing system, innovative insurance instruments etc.</li> </ul>	<b>The weaknesses</b> <ul style="list-style-type: none"> <li>➤ Undefined, unstable and changing institutional environment.</li> <li>➤ Market structure significantly influences the agricultural holdings performance due to their dependence on wholesalers and industry.</li> <li>➤ The unorganized, fragmented sector.</li> <li>➤ Poor educated farmers.</li> <li>➤ Underdeveloped, lower yields farms comparing with the EU average.</li> <li>➤ Traditional orientation: product diversification strategy is rather applied than specialized production.</li> <li>➤ Food safety issues (food quality and control).</li> </ul>
<b>The opportunities</b> <ul style="list-style-type: none"> <li>➤ Internal market capacity - higher consumption of wheat products than in the EU countries.</li> <li>➤ The regional integrations can improve the position of Serbian wheat farmers and associations.</li> <li>➤ Innovations related to the high technology implementation in the practice (building of the new software related to the crop production control and management, implementation of new financial instruments etc.)</li> </ul>	<b>The threats</b> <ul style="list-style-type: none"> <li>➤ Climate change - natural disasters such as floods, earthquakes, landslides, forest fires, droughts, heat waves, prolonged winter etc.</li> <li>➤ The economic crisis has influenced prices recorded in the international markets, and also transferred the negative influence on the domestic market.</li> </ul>

## 6.7 The Results of Focus Groups Discussion and Workshop

### 6.7.1 Introduction

The qualitative research of food chain stakeholders' attitudes towards sustainability, conditions and strategies was conducted using form of focus groups discussion defined by the project activity leader. Two focus groups (in Pancevo and Zrenjanin) were conducted in May 2017. Both FGD were conducted in Banat - eastern part of the Vojvodina Region. It is area with traditionally represented wheat producers. Younger farmers (up to 45) were included in the discussion in Pancevo which was realised in cooperation with the local agricultural advisory service office. The second FGD included farmers from different aging groups. The interviews lasted about 2 hours for each FGD.

Totally 10 farmers were asked to participate the first FGD, while 5 farmers out of 7 invited took participation in the second FGD. Additionally, all obtained results were confirmed by the food chain stakeholders (PW). The workshop was organized during the International Agricultural Fair at the premises of "Poljoprivrednik" (Eng. "Farmer" Magazine) in Novi Sad in May 2017.



Key words: FGDs - Wheat sector (TagCrowd) - Translation: održivost, marginalni, posao, proizvod, trziste, prodati, zarade, cena (sustainability, marginal, business, product, market, selling, earnings, price).

**Table 19: Basic information about FGD Participants in the Region of Vojvodina**

Organisation	Place	Status	Land	Age group
<i>The 1st FGD</i>				
Agricultural producer	Pančevo	Participated	80	<40
Agricultural producer	Pančevo	Participated	50	40-55
Agricultural producer	Pančevo	Participated	120	40-55
Agricultural producer	Pančevo	Participated	35	<40
Agricultural producer	Pančevo	Participated	60	<40
Agricultural producer	Pančevo	Participated	100	<40
Agricultural producer	Pančevo	Participated	95	40-55
Agricultural producer	Pančevo	Participated	20	<40
Agricultural producer	Pančevo	Participated	36	<40
<i>The 2nd FGD</i>				
Agricultural producer	Zrenjanin	Participated	140	40-55
Agricultural producer	Zrenjanin	Participated	30	<40
Agricultural producer	Zrenjanin	Participated	45	<40
Agricultural producer	Zrenjanin	Participated	56	>55
Agricultural producer	Zrenjanin	Participated	45	>55
Agricultural producer	Zrenjanin	Invited to participate	-	-
Agricultural producer	Zrenjanin	Invited to participate	-	-

### **6.7.2 The starting point - The meaning of sustainability**

The first associations on sustainability are connected with the environmental point of view - they emphasized importance of different sustainability aspects such as lost of varieties, intensive use of chemicals, the role of four-course system in crop production ect. Producers also think about economic conditions such as wheat price volatility, increase of production costs and input-output parity.

#### **The statements:**

##### **- Environmental aspects**

*"We have lost varieties, quantity is only important, everything is determined by price." (<40, up to 50ha)*

*"Well, sustainability, what do I know ...wheat is not so interesting, but we have to plant it... (Interviewer: Why (though not interesting)?)... Every second year it must be sown so that the soil can be cleared of sorghum and other grasses." (>55, up to 50 ha)*

*"Sustainability (besides price) implies the fact that we cannot apply the same culture each year at each field. If we want to be efficient, we must reduce costs." (40-55, more than 100 ha)*

##### **- Economic aspects**

*"We have to invest a lot, and after production storage capacities take care only on quantity, quality is on the second place, price is not determined in advance." (>55, up to 50 ha)*

*"We care only about quantities, we cannot change price, so in our interest is to be more productive." (<40, up to 50 ha)*

*"The price is very low. I remember (...when there was another minister...) for 60kg of wheat I got 100kg of fertilizer, and now you have to give 250kg of wheat for 100kg of KAN. I do not know if anyone takes care about it (thought on ministry)." (>55, up to 50 ha)*

This approach reflects certain "traditionalism". However, the awareness about environmental protection is present as well. Our interviewees are located in the region of intensive wheat production. Based on their practices, they use wheat as the culture important for soil quality improvement and control of chemicals use. It consequently influences production costs, and having in mind the price of wheat, it is not as much as important alternative as other crops. Farmers less than 40 years might have a different approach. According to the expert opinion (agricultural advisor) farmers think about economic part of their business mostly, social or environmental part is less important for them. They are also less oriented toward community development. "When group of younger farmers think about sustainability they increase area under crops and start additional business such as trade with seeds and other inputs (they often act as local suppliers to other producers on the behalf of large traders - importers and exporters)." (Expert - agricultural advisor)

### **6.7.3 Policy and regulatory conditions**

#### **6.7.3.1 Prioritization in state land leasing**

The lease market is characterised by insecure property rights and a relatively high lease tax (20 % of the lease value) that result in many lease transactions not being officially reported particularly in the Region of Vojvodina. As a consequence, land-lease contracts are often short-term and do not encourage medium-term investment in the land or in the development of the farm infrastructure. State land leasing was introduced recently to improve land market functioning in Serbia. Our discussions were dedicated both to price of leasing and a huge public discourse about the right to lease state land with positive discrimination on the behalf of livestock producers.

The agricultural advisor stress attention on this issue: "Livestock owners have the right to lease. The other producers (crop farms) must then be oriented to the land leasing from small farmers and that makes a lot of troubles. The price goes up, the price of the land leasing is even higher when a new supply of state land appeared. This is a problem in all cereal regions of Serbia." Additionally, producer (<40, less than 50 ha) emphasized following: "Livestock farmers receive land at their initial prices and afterwards they give it to third parties at a higher price and thus earn a profit. For example, one can paid 100 EUR per hectare, and offer me the same land for 200 EUR per hectare. By doing nothing, he earns 100 EUR per hectare".

The positive discrimination is also foreseen for investments in vertically integrated food processing, producing energy from renewable energy resources, using agricultural products or by-products as the raw material, enhancement of the genetic potential in livestock breeding ect. Besides mentioned aggravating circumstances (seen from the specialized wheat farms only - without own livestock production and no-alternative production systems connected with bio fuels or energy), the participants pointed out that even when they managed to lease state land, they have faced with numerous problems in the practice - short period, administrative issues and increase of overall costs.

**The statements:**

*"I cultivate my own land and state land. I have to add something... The auction commission (thinks of organizers at the local level) has no idea about anything. We were in this auction, we got a land, and we haven't received a contract yet... From the legal point we cannot "enter the property" until we get this contract. What could we do? We cultivated, and somebody can sue us that we entered illegally." (40-55, more than 100 ha)*

*"Minimum 5 years. We have to prepare the land in the first year, when you will not get anything ... so you will only get some yields in the second and third year." (>55, up to 50 ha)*

*"When these subsidies weren't available, the land leasing was favourable, and after subsidies had introduced - price of land increased. Again, when the huge private owners start to lease state land, price increased even more." (40-55, more than 100 ha)*

Our participants also pointed out positive discrimination of members of the national minority in Vojvodina - subsidies are granted for land purchase in Serbia by foreign governments. This type of activity is especially present in the Bačka region (North Vojvodina).

**A statement:** *"The national minority in Vojvodina is supported by other funds - their country gives them money to buy land here. I would take their citizenship, if I only could." (40-55, more than 100 ha)*

### **6.7.3.2 Wheat producers between tradition and modern production**

Wheat is practically the only winter crop grown in Serbia and therefore plays a significant role in the sowing structure for crop rotation purposes. Crop rotation can help to control of pests and diseases to maintain soil quality, and ensure enough nutrients are available to different crops each year. Wheat farmers in the

Region of Vojvodina plan their production based on crop rotation. On the other side, research institutes ask for better understanding of information economy and management system that is governed by informed choices.

#### **The illustration: Implementation of the ITC in the wheat sector in the Vojvodina Region**

**The regional government (Vojvodina)** - The Agricultural Service advises agricultural producers how to use their resources in the most efficient and productive way. They use ITC system to communicate and to have on-line connection (system of prompt replay).



<http://5.189.140.16/~svetodavstvo/sites/default/files/dl/smsznanje.pdf>

"The proposed agro-meteo-pheno network of sensors distributed throughout an area will generate big sets of extremely valuable real-time data, which were so far absolutely unavailable. This data will be fused with data coming from the Collaborative SENTINEL ground station (also foreseen at BioSense), and then processed to generate useful information for farmers, farms, extension services, companies and finally government and decision makers. The final information will be tailored to the needs of the end-user and range from e.g. instructions for optimal fertigation or planning of crops (for farmers), to national and local yield and price estimates, or indices for subsidies (for the government)."

[http://biosens.rs/?page\\_id=7743&lang=en](http://biosens.rs/?page_id=7743&lang=en)

Our discussions confirmed usefulness of these information systems particularly to young farmers.

*"They can get anything they want from phone. They apply as users of information system in Vojvodina and they can get any information about their land under crops, quality of plants, perspective yields, meteo conditions etc." (Expert/agricultural advisor)*

The government is improving the growing technology; therefore yields are increasing as more land is cultivated by professional producers who are better informed about new technologies and modern production equipment. Serbian wheat farmers use less than half the amount of chemical fertilizers than farmers in developed countries. Having in mind overall conditions, they aren't guided by promotion of environmental sustainability - that is a consequence of limited resources at the farm level foremost. As a result of the limited use of mineral fertilizers and certified planted seeds, crop yields in Serbia are much lower than in most EU countries. Additionally, about 40% of wheat seeds used by small Serbian farmers with limited financial resources to buy certified seeds come from the previous crop (they use their own seeds in production).

## The statements:

"For example a larger farmer treated his plants yesterday (put the chemicals in the field). Right after the treatment it was raining. Due to limited funds he cannot spray again - he will simply let his crop unprotected."

"Producers have changed their habits. They had their own calculations and calendars in the past. But climate changes have influenced their practices - they cannot finish everything in the way how they were working previously. "Just in time" practice is very important in the wheat production. They follow forecasts and experts advices more accurately now." (Expert - agricultural advisor)

**The regional government (Vojvodina)** - if you give the right information just in time using the most effective and efficient way, farmer can change their practices. Under limited funds this is the way to control overall costs and to improve use of chemicals in the context of environmental protection.

Izaberi region

Preporuke

Naziv

Naslov preporuke

Štetni organizmi

Created : 9.11.2017 (3)

Stanje u usevu strnih žita

Siva pegavost lista strnih žita (Septoria tritici/Mycosphaerella graminicola); Hrežasta pegavost ječma (pyrenophora teres)

Na teritoriji RC Pančevo usevi pšenice se nalaze u zavisnosti od vremena setve u fenofazi od nicanja do tri lista razvijena (BBCH 12-13).

Vizuelnim pregledom biljaka pšenice na vise lokaliteta, nije registrovano prisustvo simptoma biljnih bolesti.

Vizuelnim pregledom ozimog ječma (sorta Nonius, lokalitet Banatsko Novo Selo) koji je u fazi prvi list razvijen (BBCH 11) takode nisu registrovani simptomi oboljenja.

RC Pančevo nastavlja da i dalje prati zdravstveno stanje ozime pšenice i ječma i da o tome redovno obaveštava poljoprivredne proizvođače.

Region: Pančevo

Stanje u usevima ozime pšenice i ječma

Hrežasta pegavost ječma (pyrenophora teres)

Na terenu RC Ruma, u zavisnosti od vremena setve, usevi pšenice se nalaze u fazi od nicanja do početka bokorenja: vidljivo prvo sekundarno stablo (10-21 BBCH), dok se usevi ječma nalaze u fazi od 2 lista razvijeno do pojave drugog sekundarnog stabla (12-22 BBCH skale).

Vizuelnim pregledom useva pšenice nije registrovano prisustvo simptoma bolesti.

<http://www.pisvojvodina.com>



Based on information listed above, the use of chemicals can be efficiently controlled if wheat farmers follow the strict instructions of experts in the field of research - technologists, phytopharmacy experts, meteorologists and others who have to join their efforts to help facing with contemporary challenges. On the other hand, the information should be efficiently communicated / disseminated. With use of IT technologies, this system particularly meets standards of communication with younger farmers. Our discussion shows that interviewees use this system only if they are registered as direct users of state advisory service (for example in Pančevo they have direct contacts with agricultural advisor and they usually use traditional contact forms such as meetings and phone call, but they receive also information from [www.pisvojvodina.com](http://www.pisvojvodina.com) which is a part of agricultural service broadly open to the public).



### 6.7.3.3 Agricultural policy measures

Since 2015, The Ministry of Agriculture and Environmental Protection limited payment of incentives to smaller farms by reducing the maximum farm size eligible to use subsidies - the farm size limit was reduced from 100 ha to 20 ha. Approximately 94 percent of registered farmers have up to 20 ha of arable land, while the remaining 6 percent are big farmers with arable land over 20 ha. According to the new Rulebook on Allocation of Subsidies for Agriculture Production and Rural Development (adopted in 2017) planting subsidies for crop production in Serbia are 4,000 RSD/ha (half been earmarked to purchase seeds and the other half to purchase mineral fertilizers).

#### The statements:

*"All farmers use subsidies for fuel and fertilizers - fuel and mineral fertilizer bills are normally completed. There are no problems with it." (40-55, up to 50 ha)*

*"Machinery is bought mostly with commercial loans. There are good credit lines, small interest rates - for example, there are three years loans paid in two-year instalments with low interest rates. And all documentation for reimbursement is usually prepared by suppliers, so the buyer can obtain a refund from the Ministry easily. They do it for their clients (farmers). It is simply part of the service." (<40, more than 100 ha)*

*"They (subsidies) are primarily significant for medium and large producers. Farmers also use specific arrangements with input suppliers and pay in kind (with commodity). If the price is 20 RSD/kg at the market, it doesn't mean that the same price will be if farmer pays in wheat, it can be 18 or even 17 RSD/kg." (>55, up to 50 ha)*

Wheat production has undergone a transformation from a highly profitable subsidized culture, to a more vulnerable commodity recently. Our research also shows that the policy measures have no significant impact on farm income in the wheat sector in Serbia. Price fluctuations still play a vital role in farms income uncertainty. The main idea was to manage the sector development by building efficient infrastructure and institutions which will enable more market oriented production. However, the new institutions didn't give the instant improvements - without complementary development of farms sector capacity to use new forms of contracting, the results in the practice are still negligible. On the other side, the new institutions, such as public warehouses for crops, aren't as efficient as they could be. Only six public warehouses took participation in the pilot project for warehouse system development for crops in Serbia (Žitko a.d., Žitopromet a.d., Žitoprodukt ad, ZZ Zadrugarka, Jedinstvo a.d., Silos Jakovo a.d. and AD Ratar, source <http://www.kompenzacionifond.gov.rs>). It is still not recognized as the alternative by our participants.

#### The statements:

*"The conditions are defined by private warehouses, and the state doesn't want to intervene when it comes to analysing of our products quality. It can be even of a higher quality, but it is accepted at the same price as the wheat of the lowest quality." (<40, up to 50ha)*

*"And what do they do with wheat, we do not know that. It's likely that they separate different qualities according to standards and sell it at different prices." (40-55, more than 100 ha)*

High exposure to unforeseen weather conditions caused the widespread need for insurance in the sector. The government supports agricultural insurance - the agricultural insurance premium subsidies aims on increasing the number of insurance contracts concluded, in order to reduce potential losses resulting from risk occurrence. The holder of a commercial family farm are entitle to recourse, amounting to 40% of the amount of insurance premiums. For example, Montenegro offers subsidies as well, 50% of insurance premium and in Macedonia, 60% of insurance premium. Slovenia offers 40% subsidies for crops and fruits insurance premium, while local authorities are allowed to provide additional 10%. Insurance policies against specific risks are mostly held by professional farmers and agricultural companies. A large number of small farmers do not hold any insurance policy. In 2014, there were 19,768 insurance policies concluded for insurance of crops and fruits with total premium of 1,603,900,000 RSD. There were 8,015 claims, out of which 1,713 were denied. Total accrued damages amounted to 1,062,003,000 RSD (NBS, 2004/2014). In general, 78.44% of agricultural insurance policies are those related to insurance of crops and fruits. In 2014, insurance premium for crops and fruits and insurance for animals had a total share of 2.31% in the total premium in the insurance market in Serbia, which indicated that agricultural insurance was underdeveloped.

**The statements:**

*"We cannot influence climate change, and the insurance conditions are not suitable for our market. In order to act against the risks we need to introduce irrigation on the farm, even hails protection system, and for all of it we need the additional investment." (<40, up to 50 ha)*

*"We expect too much from farmers. And when he invests in insurance, the question is how much one can get after damage assessment performed by the insurance company." (>55, from 50-100 ha)*

*"Storm, hails and drought. I don't think drought is covered by these insurance policies. The state should declare a weather disaster and only then we can count on extra money." (40-55. up to 50 ha)*

*"Last year, the hail destroyed the whole production and we didn't have insurance. We submitted a request to the municipality, but we didn't receive anything. Instead, we had to pay more taxes for water management and plus regular taxes on land." (40-55, up to 50 ha)*

*"It could work ... although insurance companies are looking to pay less; they say that we don't read letters in small caps somewhere in the contract." (<40, from 50-100 ha)*

*"I've been thinking about it, but since it requires the big procedure I wasn't ready to take the action, I think that it is disadvantageous for us ... just one more thing to pay on our list." (>55, up to 50 ha)*

The potential agricultural insurance market in Serbia depends also on the agricultural households' specialization. The legal entities and entrepreneurs sector (agribusiness from the theoretical point of view) is found to be more specialized than the family farms sector in Serbia (Stojanović, Popović-Petrović, Rakonjac, 2014). Specialized farms are more prompt to use out-of-farm methods of risk control, including the agricultural insurance, while farms with the mixed production structure keep the track of traditional risk diversification using the on-the-farm methods. However, the total sector capacity to use the agricultural insurance is determined both by family and legal and entrepreneurs sector specialization.

Finally, our interviewees in Vojvodina also emphasized importance of rural development measures for multifunctional development. Our agricultural expert pointed on this issue: *"Agrarian is not same as rural policy. They differ in approaches whether agriculture plays vital or complementary role in economic and social development. In our case, rural policy is important for rural infrastructure development. In rural*

areas, we have other activities of public importance, e.g. small processing capacities that are not even tied to agriculture. Rural policy supports overall quality of living conditions in the countryside." Rural areas in Serbia are significantly different in social, economic and demographic characteristics. Basic problems and trends faced by almost all rural areas are migration, agriculture as the dominant economic activity, high unemployment rate, lack of employment opportunities, poor and underdeveloped infrastructure and low GDP per capita compared with urban regions. Most of sub-regions in Vojvodina are defined as areas with highly productive agricultural and integrated economy. In these areas a highly productive agriculture is present with better structure of farms (larger farms with higher productivity of land) and vertical integration with agricultural and food sector. Compared to the level of the Republic of Serbia, services and industrial sector are better developed in these areas as well.

## 6.7.4 Market conditions

### 6.7.4.1 Uncertainty and price volatility

Farmers are very concerned about wheat price. Other field crops (corn, sunflower, barley, soy) for the past few years have been more profitable than wheat in Serbia. Additionally, a particular problem appears during harvest season when price reaches minimum. Due to the lack of stable institutional arrangements agricultural producers simply depend on price which is completely defined in accordance with interests of large traders or exporters.

#### The statements:

*"The biggest problem is the price - it must be guaranteed, it must be known in advance, and then I will know what to sow I even don't want to go in the field without knowing the price of the cereal, to whom I will sell it ... When I put my wheat on storage, trader takes 1% of the goods on a monthly basis. In Melenci (small village in Vojvodina) there are 7 traders (with small capacity) and everyone is paying differently. The price of grain cannot go up in two days, down in the next five days during the harvest season." (>55, less than 50 ha)*

*"Now it's being advocated that everyone should make its own warehouse, to keep his goods after the harvest, and small producers cannot do it." (<40, from 50-100 ha)*

Farmers are also concerned about the price of inputs. For example, total planting costs of wheat have increased 10-15 percent in 2016, mostly due to the increased costs of diesel fuel. The current price of diesel fuel is 143 RSD/lit for spring planting, compared to 128 RSD/lit in March 2016. Farmers usually think in terms of input-output parity. Generally, producers apply strategy related to large scale crop production - they are primarily oriented toward productivity growth - they want to produce as much as they can with limited input use.

#### The statements:

*"Price of product is the first problem. We don't know it in advance, and that is also connected with price of inputs - seeds, fertilizers and other chemicals." (<40, from 50-100 ha)*

*"Every year the price of fertilizers is higher, and we do not know the price of our final products in advance...I would like to know what will be my income. We all work for money; everyone wants to have as much income as possible. And wheat price is constantly goes down." (40-55, more than 100 ha)*

*"Trader usually sells inputs for wheat production - and he tells you the price: if you want to pay immediately you have one price, and the other is the price if you pay later, in two or three months. There are 3-4 types of prices (payment by July, payment by autumn ... ) The worst problem is that we don't have money and time to go from one place to another to find more favourable conditions, and you are simply forced to take a deferred payment from a local trader - which is the worst option ever." (>55, up to 50 ha)*

*"The debt for the raw material is calculated in EUR. The worst is if you have to pay it in the grain, but you do not know the price of the grain at the moment of contracting." (40-55, from 50-100 ha)*

*"There are no decisions about varieties, it has no influence or at most, it has very limited influence on our decision making process. We only care about price. Price dictates what will be sowed. At the end, nobody ask us about the wheat quality." (<40, up to 50 ha)*

The overall impression is that farmers don't have sufficient knowledge to manage the market position. Strategies related to the use of modern instruments in the financial market (contracting using commodity derivatives) aren't option mentioned by participants. They even don't think about warehouse receipts and commercial loans. Instead of price risk control, they usually take position of price takers and decide about production based on current prices and sowing structure in crop rotation.

#### **6.7.4.2 The chain structure, institutional arrangements and financing**

Family farms usually sell their crops to traders and milling companies' immediately after the harvest. The milling companies take advantage of their large storage capacity to negotiate competitive prices from the farmers. However, for the past couple of years, the government has started to intervene by providing storage subsidies in order to allow smaller farmers to store their wheat and then sell it later when wheat prices are more advantageous (The Public Warehousing System). Nevertheless, large trade companies also act as the input suppliers and take double advantage over farmers - as input trader and buyer of the commodity for export at the same time.

##### **The statements:**

*"After the harvest wheat goes to warehouses. We are charged for storage (services) until sell supplies to large traders - mostly exporters." (<40, from 50 - 100 ha)*

*"Exporters of wheat are often input importers. They are large players, they have their own production. Ten of us can gather and we will have only 1000 t of wheat. Where can we export it? It does not go that way, it goes through other organizations." (40-55, more than 100 ha)*

*"The organization is very important. The advanced producer can have another company who deals with the supply of inputs and the sale of raw materials. It usually integrates different stages from production to sale, including procurement of inputs to other farmers, their partners." (Agricultural advisor)*

Having in mind very limited implementation of public warehousing system in the practice, the complementary law on Pre-Harvest Financing of Agricultural Production was introduced in June, 2016. Adoption of this law arose from the need to increase the volume of primary agricultural production by improving existing financing. The law allows the use of future production (crops, fruits, vegetables, etc.) to be used as a form of collateral to secure a loan. The law also envisages that the contract relating to the financing be entered into a registry, so it will be possible to check whether a parcel of farmland is encumbered with a loan. The whole project was financed by the European Bank for Reconstruction and Development (EBRD) who helped the Serbian Ministry of Agriculture and Environmental Protection draft the law and the software for the registration of contracts, along with the UN Food and Agriculture Organization (FAO). This law wasn't even mentioned by our participants during discussions. The so-called "green" sales become common in our practice. This mainly involves the sale of products that have not yet been finalized or harvested from the field. In the sale in green, however, it is also possible to include the raw materials in the natural exchange. In this way a part of the produce is sold in advance.

When it comes to financing of farm business, particular problem is connected with financing of new technologies and inputs. The continuing request to modernize production exists. Wheat producers cannot compete at the market if they don't apply new technologies. They have to buy new equipment which is very expensive. Our farmer emphasized: "I care most for input-output parities. If I want to invest in mechanization, I have to save on fertilizers and seeds." In Serbia, 95% of all tractors are older than 10 years. Serbian farmers also use harvesters with an obsolete technology, and the agricultural equipment seen on Serbian fields can be still seen only in undeveloped countries. "Despite this under-utilization, Serbian agricultural sectors still manages to produce more than domestic demand and has been recording surplus in external trade. Outdated agricultural machinery and equipment is one of the reasons why our agricultural potential hasn't been fully utilized." (Expert)

A particular problem is the lack of cooperation or various forms of associations in the sector. Agricultural producers take the role of individual actors in the market and thus reduce the chance to impact on price formation. Cooperatives in Serbia are faced with numerous problems: management system is complicated and sometimes insufficiently professional and does not match the needs of modern agricultural production, cooperative members who are able to bear the risk are not motivated due to possible risk/benefit asymmetry, cooperatives either do not have property (new ones) or the property is treated as socially owned and the disposal of which requires consent of the Privatization Agency through a long and uncertain process. Cooperatives have a great number of advantages, such as: a) trust of cooperative members in collective work, particularly strengthened through the system of collective decision-making and entrusting enforcement of the decisions and reporting on their implementation to one of their members (director); b) non-profit nature of the cooperative – which assures the participants in the collective operation that only most necessary costs will be collected; c) social functions of the cooperative – for which it is easier to accept than it is for a company, due to its non-profit nature, the financing of social activities in the village. Cooperatives, in Serbian economy, are moving in the right direction, but slowly and often in back and forth manner.

#### **The illustration of positive aspects and problems based on FGD participants statements**

*"I remember as a child that everything went through the cooperative." (>55, less than 50 ha)*

*"5-6 farmers can cooperate in a village; it's already a sort of safety net for peasants." (<40, less than 50 ha)*

*"When we buy machinery, we could buy one instead of five machines using a cooperative. We could make our own silo, as an association you can simply compete on the market." (40-55, from 50 to 100 ha)*

**but...**

*"We had cooperatives in the past, it was a good thing - you had to give your products to the organization and people were satisfied. For example, Agrovot bought Zemproz (the agricultural cooperative in Melenci, small rural place near Zrenjanin where FGD took place). And I am asking myself - how was someone able to buy something that is a village property?" (>55, from 50-100 ha)*

*"The problem is that the cooperative ownership somehow passed into the hands of a private person. People once had a negative experience in cooperative business ... to entrust someone with my property, machines, etc. it is hard to believe." (<40, from 50-100 ha)*

*"The state destroyed co-operatives ten years ago and now they want cooperatives on the market scene." (40-55, more than 100 ha)*

### **6.7.5 How do sector stakeholders perceive their strategies?**

Wheat is winter crop grown in Serbia that plays a vital role in the sowing structure for crop rotation purposes. Parallel, the Serbian agrarian policy of subsidies per hectare for the past two years has been less favourable to wheat farmers. Competition from other field crops (corn, sunflower, barley, soy) is high - for the past few years they have been more profitable than wheat. As the individuals cannot influence the price directly due to low market power, the main idea was to build up infrastructure for price control based on warehouse system and related financial instruments. This form of institutional innovation has faced numerous problems in the practice due to identified inconsistencies and lack of knowledge for new strategies implementation.

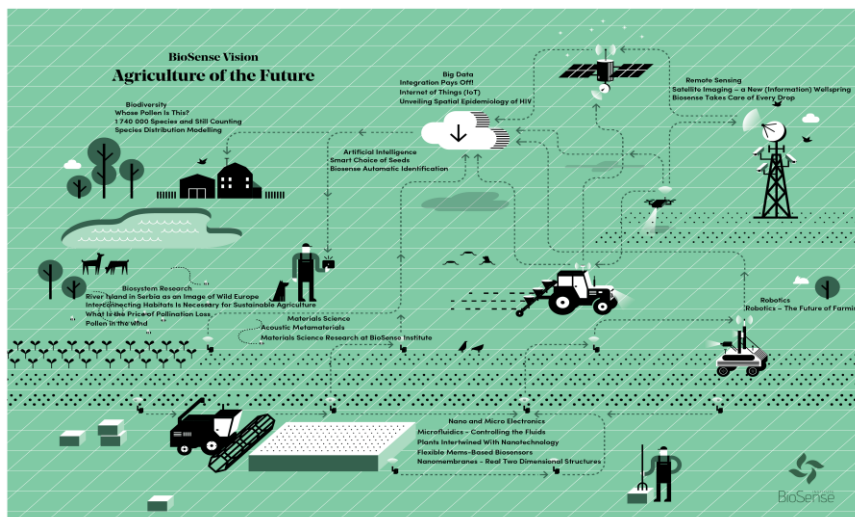
An alternative could be connected with structural shifts to large family farms with improving the growing technology, better informed choices on inputs, production and trade. This alternative is particularly emphasized from the policy makers' point of view. Farmers included in interviewing recognized the production related options only - technology improvements based on modern inputs or product reorientation.

#### **6.7.5.1 Technology improvements and increasing farm ownership**

Winter wheat production accounts for one third of the entire field crops production in Serbia, which can be explained as a need for optimizing sowing structure and following a crop rotation on farms. Our farmers take wheat production as the second best alternative - they use this crop culture to assure land quality and preserve environment. So, they don't use it for profit itself, but for traditional reasons (intensive, but more environmentally oriented production). Although they are forced to use wheat in their sowing structure, this doesn't mean that they aren't interested in different risk insurance methods for increase of yields and to

achieve better results on the market. Additionally, technology improvement usually goes with farm spreading - producers who want to stay competitive should buy more land or lease to decrease cost per unit of production.

Traditional farms that sell crops usually go for capacity expansion - they expand their activities horizontally with more land in ownership or leasing. They accept low margins to maximise returns by increasing productivity and spreading fixed costs over increased production. This strategy usually requires large capital investments in land, machinery and other assets. The critical element is access to capital. However, the policy makers should also think about creation of the system that can make farmers be more efficient in use of inputs (seeds, fertilizers and other chemicals). This system can be based on IT implementation in agriculture and big data analysis.



**Picture 1. BioSense vision of the agriculture in the future**

**Source: BioSense Institute, Novi Sad / Region of Vojvodina**

The research institute (BIOSENSE, Novi Sad - Centre of Excellence for Advanced Technologies in Sustainable Agriculture and Food Security) delivers innovative solutions accessible by all farmers, regardless of the size of their holdings. The farmers can easily reach important information about the state of their crops, crops prices, weather forecast at the micro location, input use, optimization and that can allow them to become sustainable in the global competitive environment. The capacity of this centre is not fully utilized, but producers in Region of Vojvodina have approached through the system and use all available information for management purposes.

Another problem is connected with less developed land market which is not functioning well. It is a huge obstacle for strategy based on increasing of farm ownership. One of the main problems of Cadastral records in Serbia is related to the way how data is organized and kept, which affects the data integrity and it is unable to address user needs in timely manner. Market of agricultural land is the most active in Vojvodina. Srem, Banat and Backa have the most attractive land because of the soil quality and flat topography and it puts them in a region where land prices are constantly rising. Another problems arises if the state land leasing is involved - wheat farmers argue about the necessity of better organization of land leasing in Serbia. About one fourth of the total land is being cultivated as leased, and one third of leased land is state owned land).

### **6.7.5.2 Product reorientation - start with the new combination of crops or leave the business**

Prompt to address the possibility for production reorientation, younger farmers set out a strategy for combining production of wheat and vegetable crops (cabbage). The main crops have the longest vegetation, and for this reason the longest period of time remains on the production areas, while the previous and subsequent crops of a significantly shorter vegetative period and session are planted before or after the main crops. What are the main benefits? First, taking into account the economic aspect of growing subsequent crops, it comes to the conclusion that this kind of production is a good way to make a greater profit. Namely, an economic index of this type of production is 1.5, which means that the annual revenue per unit area is increased by a minimum of 1.5 times. Second, by cultivating post-crops, the available land is used more rationally, which, after harvest, generally remains unsalted and without green cover, the soil loses moisture which makes the cultivating of such a land more difficult. Third, unprotected soil is a subject to erosion. It can be prevented by subsequent sowing. Fourth, the land without crops is rapidly wrapped up and the weeds are vectors of transmitters of certain pathogens of plant diseases and pests that are potentially dangerous for neighbouring crops, suggesting that it is better to have crop on the plot throughout the year. Although positive examples of cultivation of post-cultures have been proven through practice, in our country this production technology is represented in a small percentage. In addition to the aforementioned positive effects, subsequent sowing has also limiting factors - temperatures and rainfall.

#### **The statement:**

*"Marginal producers will disappear from the scene. Those who are on the border to survive from agriculture can change their production, turn from wheat to vegetables growing with the desire to sell their products on a green market. Once again, when prices of wheat are rising, producers will again sow wheat. When a price of wheat goes down, they sow vegetables." (Policy maker)*

*"The producer decides on the basis of the price - he makes changes in the production structure. He can produce sunflower and corn; he doesn't take care if it is bad as many pathogens might occur on corn, for example. If the price of wheat is too low in September/October, he might decide to produce another culture. He can also combine potatoes." (Agricultural adviser)*

The purchase and use of irrigation systems in our country is not so frequent and the irrigation capacities are still small and insufficient, but in recent years they have been increasing through the competitions announced by the Ministry of Agriculture and Environmental Protection and the Provincial Secretariat for Agriculture, Water Management and Forestry. Sometimes good production results can be achieved even without irrigation, if the weather conditions are favourable and if, after the harvest of the main crop, the appropriate agro-technology is quickly and correctly applied (timely processing of soil immediately after removal of crops, as this influences the preservation of the soil moisture necessary for next crop).

The other alternative might be to quit the business, sell the property (land and other assets) and have business out of agriculture. Having in mind traditional orientation of producers in Serbia ("land of grandfathers is not on the sell"), it is not a real opportunity. However, continuing existence in rural areas with inefficient agricultural production is not a solution both from producer and policy makers' perspective.



### 6.7.5.3 Risk control and institutional improvements

Wheat is an open pollinating crop and hence not very attractive for investments. Serbia belongs to low wheat yields regions highly dependent on weather conditions. Therefore financial risk management tools should have more importance in the practice. Wheat is generally delivered into warehouse with grain handling companies. If stored on farm then it is usually sold into the domestic market. The warehouse companies / traders usually sell wheat to domestic industry or at the foreign markets. The new trade arrangements are highly recommended such as credit based on warehouse receipt, pre-financing models for wheat producers, new forms of contracting between farmers and traders, including the hedging strategies with commodity derivatives. However, this system is still in its infancy in Serbia. Our respondents argue about necessity of integrative approach - new legislation, new institutions, new instruments cannot be efficiently implemented in the practice without good education programmes for targeted groups of farmers that are able to use new financial instruments in price risk control.

Finally, all strategies combine bottom-up with top-down approach aiming on different risks control (weather, productivity growth, control of chemicals use, quality improvement, standardization, price volatility, income diversification, new technologies implementation and control of costs of fixed and variable inputs).

### 6.7.6 JUST IMAGINE YOUR BUSINESS IN 2027

At the end of conversation we asked our participants to address the vision of their business in the line of the next 10 years. The box below includes their visions from qualifications such as I don't care about the future at all, to listing of different problems that are seen as the main obstacles for the sector development in the future. Farmers argue about necessity to give the fair chance to family business development such as the companies organized as agribusiness industry have in Serbia. Elderly also might think about retirement scheme which will allow generation change with better opportunity to develop modern farms businesses.

#### The statements:

*"You are asking me what will be in the next ten years, I do not know what will happen tomorrow." (>55, less than 50 ha)*

*"My neighbour worked on 100 acres, has three tractors and a combine. Now, his land is leased, and the he wants to sell his machines ... He says it's no longer worth doing." (<40, from 50-100 ha)*

*"I hope it will be better. I have children and I hope that it will be better, but it is difficult to achieve. We are going to have very big problems with the use of chemicals; the land will be contaminated "... The livestock fund has decreased, there is less and less organic fertilization, we use chemicals, it will bring our land to be of poor quality." (<40, less than 50 ha)*

*"The younger should think about it, and we, elderly, should think about retirement. In the 1980s, we still had good livelihoods from agriculture, and from 1990 to 2000 we were completely destroyed, we were doing our*

*best to harm ourselves, to ruin our business. However, in recent years, we are going again down the path."*  
(40-55, more than 100 ha)

The perspective of farms that produce wheat could be easily described by an expert opinion who participated in our analysis: "If farmer doesn't have children who want to continue with agricultural production, the land of this farm might be a part of large quantum of land tenure system in the future. On the other hand, some farmers insist on education - their successor must be trained in the secondary agricultural schools or at the agricultural faculties. These farms have an opportunity to develop, to become part of the exclusive body of larger farms in Serbia. They can even move their production to other areas - suitable for agriculture with low prices per hectares of arable land. By changing technology they can make high yields at lower costs and can make progress. Unfortunately, the marginal producers are condemned to sell land."

Participants also stressed the need for a stronger state commitment to manage the system and to build the institutions that are necessary in order to facilitate farmers with important instruments that can help in managing their position on the market. Farmer above 55 said: "Policy - if the state doesn't do something, we will lost everything!". On the other side, farmer less than 40 with land less than 50 ha in his ownership in Vojvodina emphasized the importance of pure economic, market rules that will lead to the aggravation of agricultural production in the future: "Large, industrially organized capacities will take over all production, there is a trend of tightening. A few will cultivate the whole land, and that is not going to be good." Having in mind that large farms, which are organized in the form of agribusiness (the legal entities), might have different goals than small local community or state in the context of environment or public health protection, this will again lead to a stronger state involvement in market regulation.

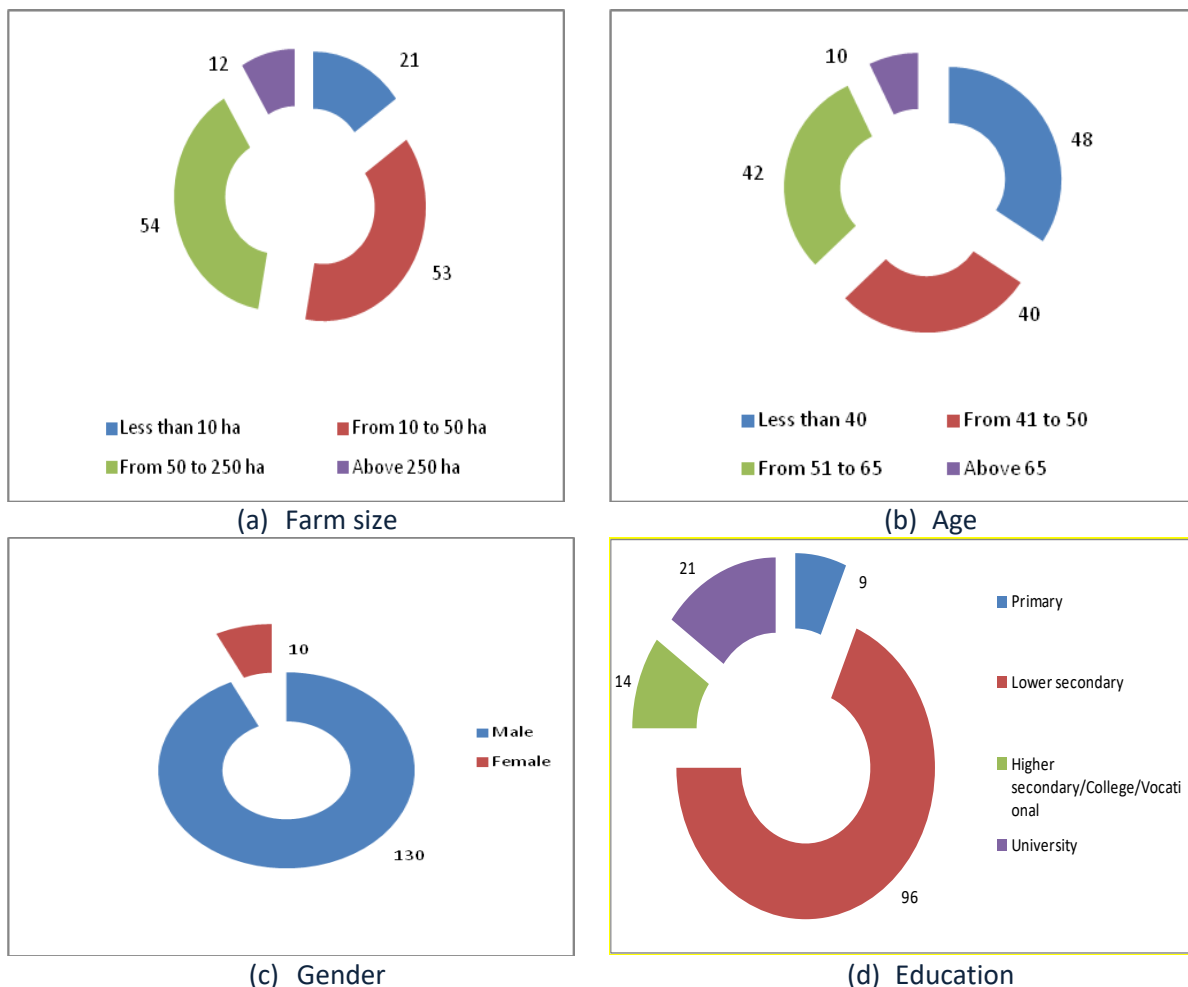
## **6.8 THE WHEAT SECTOR - SURVEY RESULTS**

### **6.8.1 Introduction**

The Vojvodina region is the main and traditional Serbian region of the wheat production. Because of the historical, but also environmental and social factors, agriculture in Vojvodina differs from one in the Central Serbia. The average farm size is quite larger, the agriculture is more specialized and mainly relays on crop production. A random selection of the sample units is made based on two main levels of stratification: the district level in the Region of Vojvodina, and farm size. The analysis is focused on young farmers (less than 40 years) and farms above 20 ha of agricultural area of wheat as the additional criteria. The sampling frame, i.e. the list of primary producers is obtained using the Census data (2012). The sample of primary producers in the region for study is representative for the targeted population (Annex 3).

The data collection was supported by the agricultural extension service in the Region of Vojvodina. The interviews were conducted in December 2017 / January 2018. The interviews were lasting on average 35 minutes and conducted using the face-to-face method. The interviewers were trained based on the guidelines prepared by the WP leader. The questionnaire was translated in Serbian, while the regular procedure of translation and back translation were used. The sample size is 150 and the final database

contains 140 responses (10 interviews were rejected due to inconsistency in answering, e.g. very low understanding of questions by farmers – in these cases the lowest level of understanding is marked in the questionnaire).

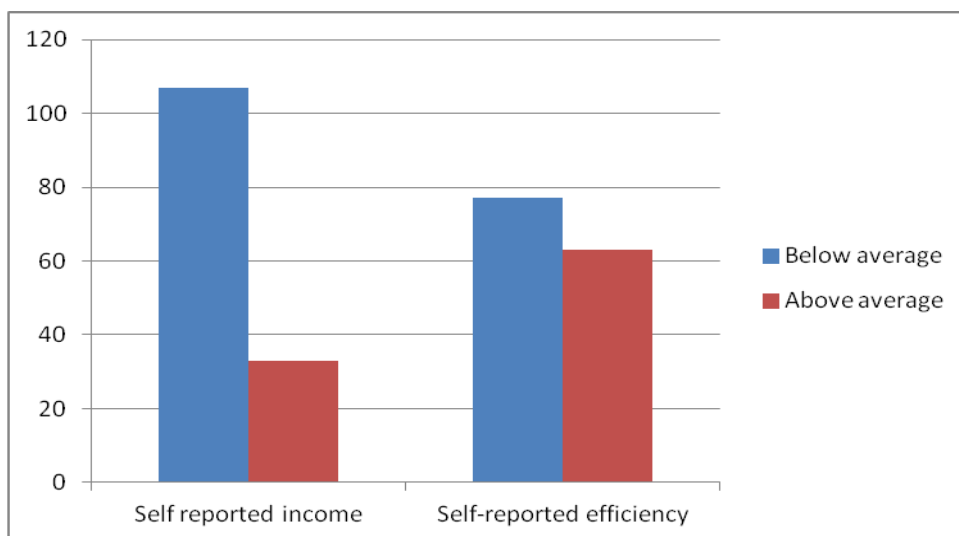


**Figure 12. The number of interviewed farms by a) farm size, b) age, c) gender and d) education.**

Source: Source: SUFISA farms survey (RS – wheat)

The main characteristics of our farms in the sample are presented in the Figure 12. The larger farms dominate in the sample (the smallest number of farms belongs to the group of less than 10 ha of total area). Young farmers represent more than one third of our sample. Traditional gender structure is manifested by larger share of male farmers, while the share of lower secondary education level among farmers is almost 70%.

Self-reported income is calculated using data on average price and quantity sold per farm during the observed period (The Figure 13). The average income per farm is 33,418 euro (based only on wheat production). The information about the cost of wheat production is collected as well, and the average share of cost in total income collected only in the wheat production is 76.5% (self-reported share).



**Figure 13. Self-reported income and efficiency of surveyed farms (no. of farms)**

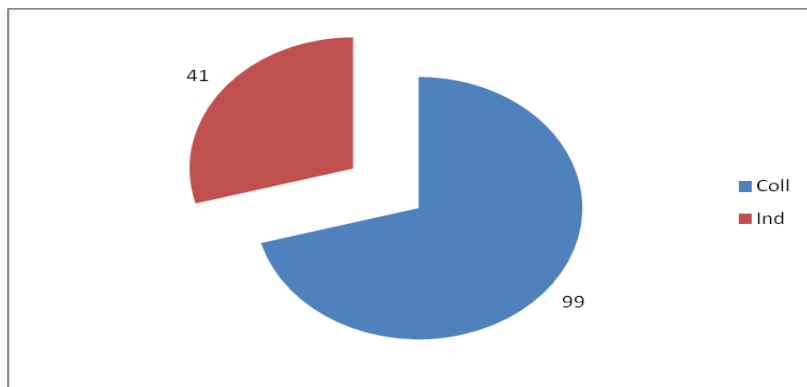
Source: Source: SUFISA farms survey (RS – wheat)

The objectives of the survey are to map existing institutional arrangements across in the Region of Vojvodina in the wheat sector and to identify the main attributes characterizing institutional arrangements in the sector. Additionally, the survey aims to explore the sustainability through producers' opinions regarding quality of institutional arrangements and its role in achieving sustainable farm businesses (in economic, social and environmental context) including collection of information on the adoption of good environmental practices and sustainability standards. Finally, the survey addresses the factors driving primary producers' decisions about farming strategies in the future in response to potential emerging issues (adverse climatic conditions and pests, market changes and price volatility, policy and regulatory reforms).

The objectives are reflected in the structure of the questionnaire. Section A (QA.1 - QA.5) informs about surveyed farm business characteristics. The purpose of this section is to collect data on the farm's structure which will be subsequently used to explore the extent to which some institutional arrangements are more likely to be adopted by certain farmers groups. Section B (QB.1 – QB.34) asks questions about the wheat case study - amount of production sold in the last completed financial year 2016/17, sales channels - collective (cooperatives, POs and unions) or individual (wholesalers, retailers, exporters, local shop and markets, restaurants or processors). Different characteristics of dominant institutional arrangements (the main sale channels) are further observed by asking more specific questions in the section C. This part of the questionnaire mainly consists of yes-no questions (characteristics related to formal or informal sale contracts, duration of contract arrangements, involvement of different criteria for price definition, payments and standards involved), average price for the commodity obtained during the last completed financial year 2016-17, self-perceived level of farm efficiency and farmers perception of overall quality of sale arrangements, particularly on the context of achieving sustainable farm practices (Section C1). Finally, Section D (QD.1 – QD.24) covers future strategies related to main challenges farmers are faced with. This section also addresses farmers' attitudes towards importance of the main factors that will influence the sector sustainability in the future. The key farmer socio-demographic characteristics are collected in the section E (QE.1 – QE.5), while section F (QF.1 – QF.10) is designed as the administrator sheet completed by the interviewer, including interviewers mark on overall quality of farmers understanding of the questionnaire.

### 6.8.2 Sales channels: reporting the results of section B of the questionnaire

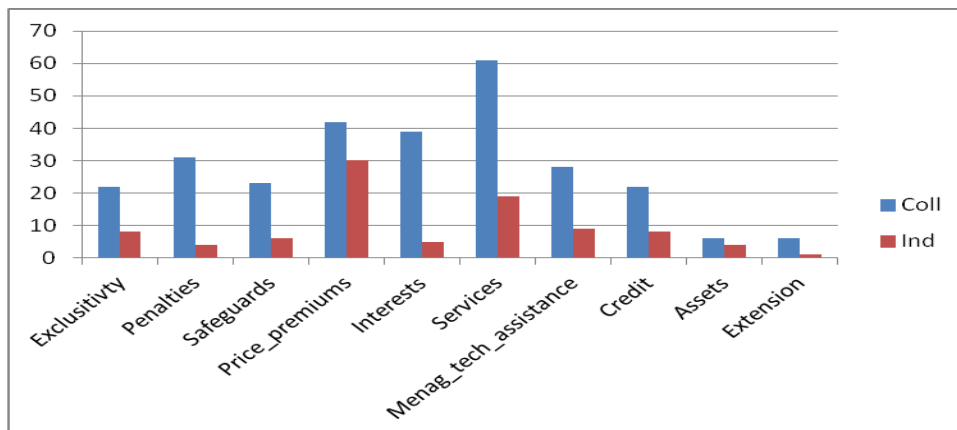
The next graph (Figure 14) presents the sales frequency related to the collective (Coll), and individual (Ind) sales channels in the wheat sector (n=99 for collective vs n=41 for individual). Notably, there are four types of wheat producers in the Republic of Serbia – individual producers (family-owned farms), agricultural holdings, agricultural companies and agricultural cooperatives. However, small family-owned farms dominate the total number of producers. The fact is that farms with more than 20 ha represent only 3% of the total number of farms. So, the orientation of small producers towards collective sales channels and still existing trust in them is inherited from the socialist era. Large producers mainly sell directly to the wholesalers or exporters.



**Figure 14: Collective and individual sale channels in the wheat sector**

Source: Source: SUFISA farms survey (RS – wheat)

Figure 15 depicts primary characteristics of collective and individual sale arrangements. Interpretation of the results is relative to the frequencies presented in Figure 14. Therefore, in relative terms needed exclusivity of sales (Exclusivity) and primary producers crediting (Credit) and eventually, managerial support or technical assistance they receive from buyers (Menag\_tech\_assistance) are rather similar in both “collective” and “individual”. On the other side penalties if you fail to deliver the agreed quantities (Penalties) can be considered as residual in the case of an “individual”, but are quite significant in the case of “collective” selling arrangements. The same could be underlined in the case of safeguards if the buyer fails to fulfil the agreement (Safe), interest in case of delayed payments from the buyer (Interest), and services that buyers provide to the primary producers (Service) – like storage, transport and handling.

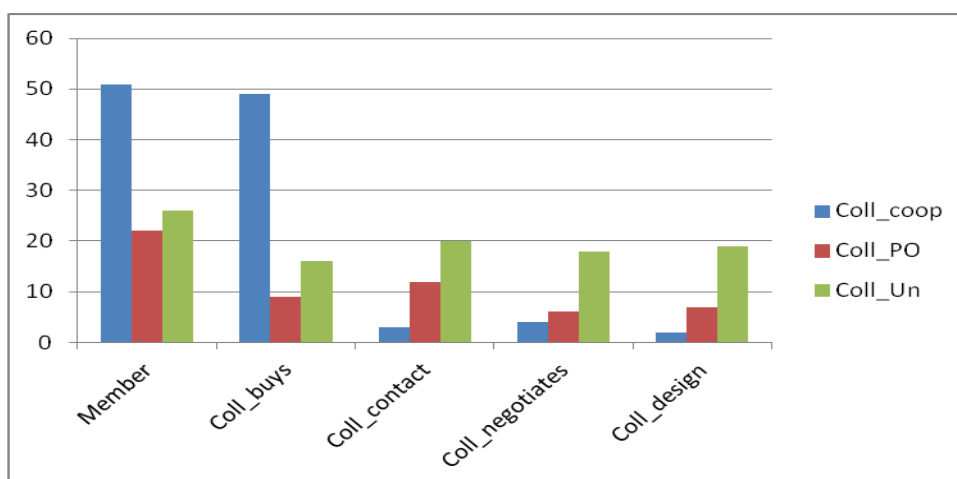


**Figure 15. The characteristics of collective and individual sale arrangements**

Source: Source: SUFISA farms survey (RS – wheat)

However, regarding the price premiums for delivering higher quality products (Price\_premiums) “individual” significantly outperforms “collective”. This can be partly explained by higher bargaining power of large farms relative to the small ones – which mainly use collective sales channels. Providing special assets, technology and/or machinery (Assets) and use of the automatic extension mechanism in the agreement (Extension) can be neglected in both cases in relative terms.

Figure 16 further shows the statistics related to collective sales channels by answering the question what collective organisations do on behalf of their members. There are three categories of interviewed farmers that use some aspects of the collective sales channels in their practices – members of cooperatives (Coll\_coop), members of producers’ organisation (Coll\_PO), and members of farmers’ union/association (Coll\_Un). The dominant portion of the total of these three categories belongs to the cooperatives. This organisation mainly serves as the buyers of their member's production, and in sporadic cases they help them to define and design their buying contracts, negotiate with final buyers and provide them with necessary contacts. The frequencies of producers’ organisations and farmers’ union/associations are similar. However, it seems that farmers’ union/associations are more valuable to the farmers than producers’ organisations, regarding the buying, contracting, negotiating and contracts design activities.



**Figure 16. Collective sale characteristics – What do collective organisations do on behalf of their members?**

Source: SUFISA farms survey (RS – raspberry)

### **6.8.3 Characteristics of sale agreements: results of section C**

Based on the data of total area of the surveyed farms, both rented and owned, and also area used for wheat (Table 21), as expected, the higher average income in total is generated on farms of larger size. However, it is interesting to notice that the average wheat price is higher for the group of farms from 10 to 50 ha in comparison with other firm size groups (both in total and wheat area). In addition, collective sales channel dominates the individual in all firm size groups except for farms above 250 ha. However, the youngest farmers on average belong to the group of the largest farms (44.25 years based on total area and 41.67 based on wheat area on average).

**Table 20: The interviewed farms characteristics based on farm size**

Characteristic	< 2 ha	2 to 10 ha	10 to 50 ha	50 to 250 ha	> 250 ha
<b>Wheat_Total_Area</b>					
Total_area_av	-	5.60	23.59	102.91	612.50
Comm_area_av	-	2.24	8.08	35.53	181.67
Comm_income_av	-	1138	7700	32486	198860
Comm_price_av	-	0.139	0.160	0.146	0.143
Cost_share_(%)	-	79.50	78.73	75.36	74.17
Comm_sold_(%)	-	72.00	77.69	87.15	87.50
Coll_channel	-	11	41	46	3
Ind_channel	-	12	19	16	9
Total_no	-	20	52	56	12
Age_av	-	45.90	46.25	47.69	44.25
<b>Wheat_Comm_Area</b>					
Total_area_av	7.44	18.84	70.89	244.60	1380.00
Comm_area_av	1.12	4.52	22.22	74.35	510.00
Comm_income_av	621	3387	21334	72025	565763
Comm_price_av	0.142	0.142	0.158	0.144	0.143
Cost_share_(%)	70.63	79.30	77.23	75.00	71.67
Comm_sold_(%)	73.75	72.73	86.89	84.75	90.00
Coll_channel	5	32	53	12	0
Ind_channel	3	19	17	14	3
Total_no	8	44	20	20	3
Age_av	44.88	47.48	47.05	45.45	41.67

Source: SUFISA farms survey (RS – wheat)

Concerning the age of farm owners/managers (see table 22), the highest number of farms (n=48) is in the age range under 40 years with an average age of 34.59, while the group of older farmers (>65 years) with an average age of 68 years consists only of 7 interviewed farmers. The total wheat income generated is highest for the group of farmers under 40 years, while farmers from 50-65 years old are capable to achieve the best price of wheat at the market. However, the highest share of cost in generated farm income is reported in this group as well, referring to implementation of old technology or absence of innovations. Implementation of low input technologies also appears in the oldest group of interviewed farmers.

**Table 21: The interviewed farms characteristics based on age structure**

Wheat_age	<40	40-50	50-65	>65
Total_area_av	138.88	103.22	74.14	47.57
Comm_area_av	45.88	37.04	18.77	16.14
Comm_income_av	46434	36306	19057	16064
Comm_price_av	0.141	0.145	0.165	0.145
Cost_share_(%)	76.67	74.00	81.48	69.29
Comm_sold_(%)	83.78	81.00	79.27	81.43
Coll_channel	28	34	34	7
Ind_channel	21	15	17	3
Total_no	48	40	44	7
Age_av	34.59	46.10	57.16	68.00

Source: SUFISA farms survey (RS – wheat)

As far as farmers education is concerned, higher educated farmers manage the largest farms on average (around 260 ha in total and 93 ha in wheat area). The highest number of collective arrangements is present in the group of lower secondary educated farmers (n=71), while higher secondary educated farmers report the highest share of collective arrangements in total number of arrangements. The individual arrangements are overrepresented in the group of higher educated farmers with traders/exporters as the main counterpart. Relative importance of individual sales is higher also for the group of primary educated, oldest farmers who decide to sell their products at the local markets (see Table 23).

**Table 22: The Interviewed farms characteristics based on education**

Wheat_edu	Primary	Lower secondary	Higher secondary	University
Total_area_av	38.56	79.47	79.36	259.12
Comm_area_av	16.94	22.37	29.84	92.89
Comm_income_av	14879	21469	28547	99232
Comm_price_av	0.143	0.154	0.144	0.139
Cost_share_(%)	78.89	77.40	72.14	78.00
Comm_sold_(%)	70.00	78.52	91.43	93.10
Coll_channel	7	71	12	11
Ind_channel	4	35	7	10
Total_no	9	96	14	21
Age_av	59.89	46.34	45.64	43.00

Source: SUFISA farms survey (RS – wheat)

Finally, all mentioned above concerning collective and individual arrangements is presented in a separate table (see Table 24). Price of wheat is self-reported and based on average wheat price during the observing year (2016/17). The interviewees were also asked to explain how the contract arrangements were set related to price discovery process and payments to farmers.

**Table 23: The characteristics of interviewed farms based on sale channels**

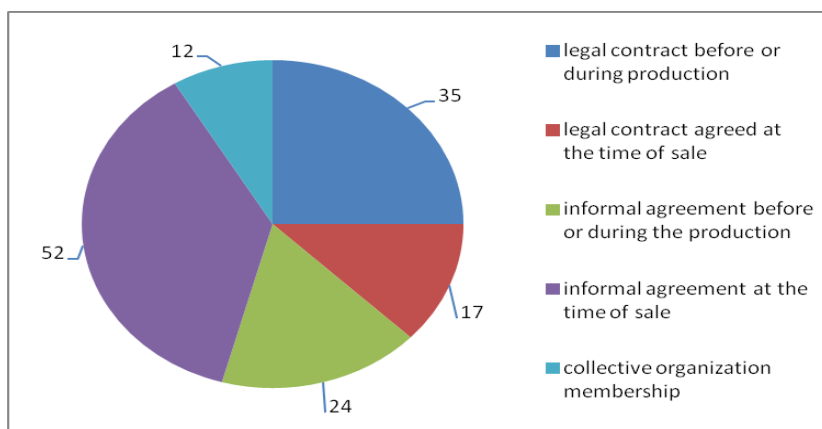
Wheat_sale_channel	Coll	Ind
Total_area_av	63.09	202.02
Comm_area_av	19.69	66.32
Comm_income_av	17511	71827
Comm_price_av	0.143	0.166
Cost_share_(%)	176.51	78.90
Comm_sold_(%)	82.91	77.93
Total_no	99	41
Age_av	16.00	43.95

Source: SUFISA farms survey (RS – wheat)

Formal and informal arrangements co-exist (Figure 17), although the informal arrangements are more popular and therefore, widely accepted. The informal agreement at the time of sale is most represented in our sample (n=52), followed by legal contract before or during production (n=35). The lowest frequency is



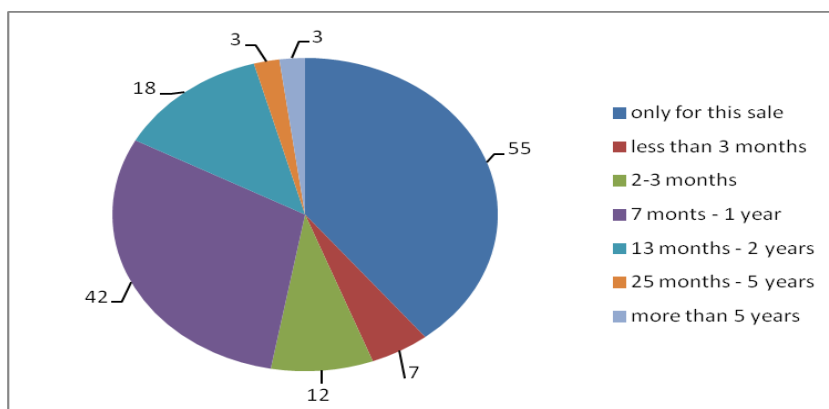
recorded for collective organization membership (n=12). It might be controversial as collective type of sale dominates our sample (see Table 24). It can be explained by specific characteristic of the Serbian “cooperative” sector were limited number of farmers hold membership, while the majority of farmers are only the coop-partners (so-called “kooperanti”), referring that membership is not precondition for institutional arrangement with cooperatives in Serbia.



**Figure 17. Type of agreements**

Source: SUFISA farms survey (RS – wheat)

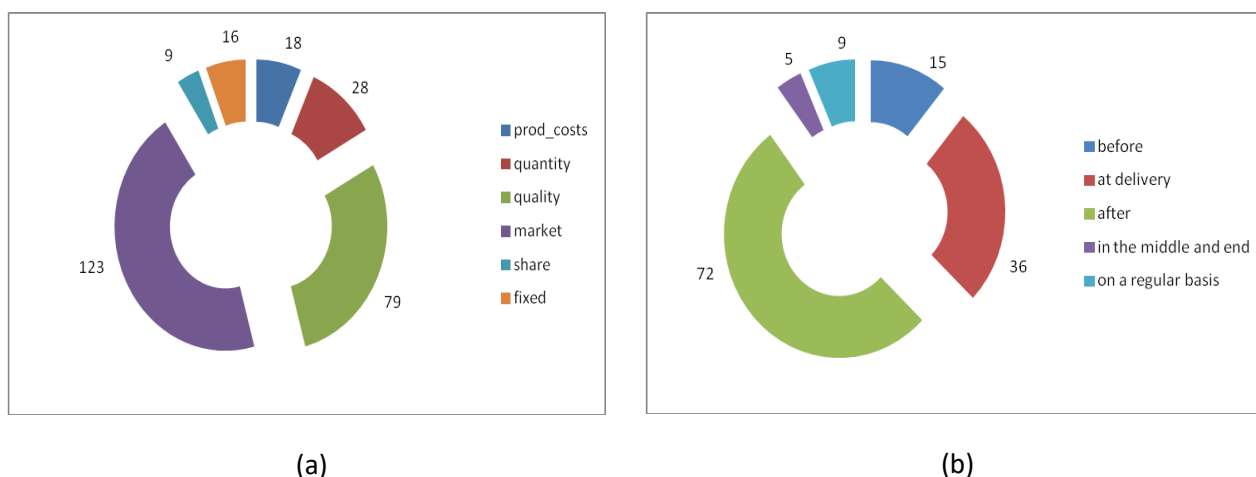
Most sales agreements are made either for particular sale (n=55), or they last between 7 months and 1 year (n=42). Surveyed farms reported limited number of medium (n=21) or long run contracts (n=3). As the short run arrangements between farmers and other stakeholders prevail (Figure 18), a lot of problems arise for our wheat farmers as they cannot count on stability of price arrangements. Without stable price arrangements, it is hard to run the farm business successfully.



**Figure 18. Duration of agreement**

Source: SUFISA farms survey (RS – wheat)

The price is self-reported and based on average wheat price during the observed year (2016/17). The average price reported by farmers for the year 2016-17 is 0.15 EUR per kg. However, farmers who are involved in individual sale channels managed to reach a higher wheat price of EUR 0.166 per kg in comparison to the collective who get a price of EUR 0.143 per kg, on average. In the total sample of farms production costs as share of selling price vary between 40-100%, being on average 76.69%. The interviewees were also asked to explain how the contract arrangement was set related to price discovery and payments to farmers.

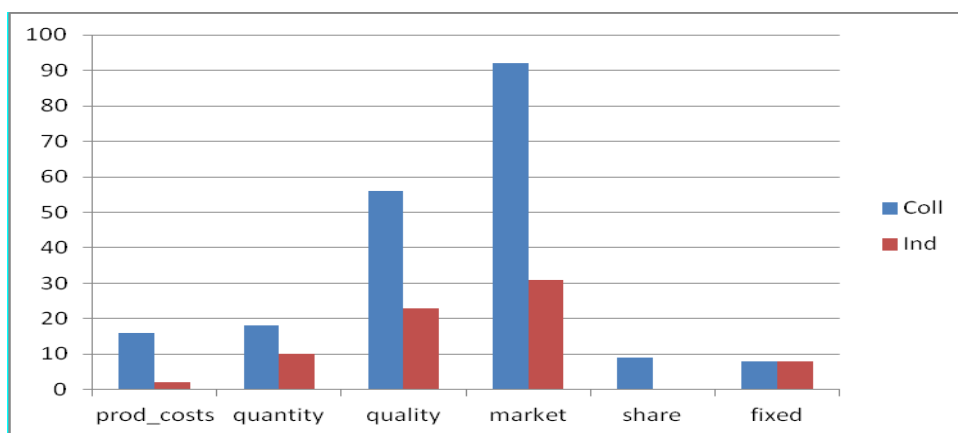


**Figure 19. Price and delivery settlement: (a) how is the price defined? (b) when are the payments made?**

Source: SUFISA farms survey (RS – wheat)

Figure 19 panel (a) shows interviewed farmers reasoning of how the price they received is defined. Predominant frequency belongs to the market supply and demand conditions, while the rest of the pricing formation rests on the product quality. Other elements, such as farmer real production costs, quantities they produce, share in organisation's to which they sell, or relying on fix price based on the predefined agreement is the extremely rare reasoning of primary producers regarding the wheat pricing formula. On the other side, Figure 19 panel (b) shows when the farmers get paid for delivered products. Most of the payments in this sample belong to the category "at delivery" of the product or even "before" that. Other categories are quite rare. "At delivery" category is an obvious consequence of normal market relations of primary producers with their buyers, and pricing formula mentioned above – which suggests the standard price formation. The category "before" may suggest the unfavourable position of the primary producers in the supply chain as they have to sell their products in advance, usually below the market price. If they had the opportunity to store their products and sell them in six to nine months after the harvest, the price would be much better.

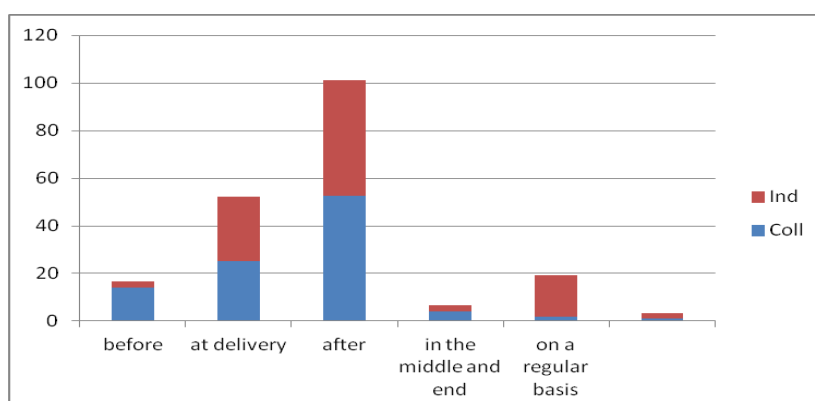
Figure 20 separates the frequencies of collective and individual sales channels regarding the question "How is the price defined?" (See figure 19a) In relative terms, there are pretty close beliefs of farmers from both types of the sales channels that price is based on delivered quality. With minor deviation, it can be said that this could also be the case with quantity. Production cost is almost unimportant in pricing formula in individual sales channels, but it is not the same regarding "collective" part of the sample. On the other side, demand and supply conditions determining price are present in both cases – with a slightly higher relative frequency in the case of "collective" arrangements. Beliefs that the price is based on the share of buying organisation's profit is negligible, and this can even be said for the facts related to the price fixing at the beginning of the agreement.



**Figure 20. Price determination collective/individual sales channels**

Source: SUFISA farms survey (RS – wheat)

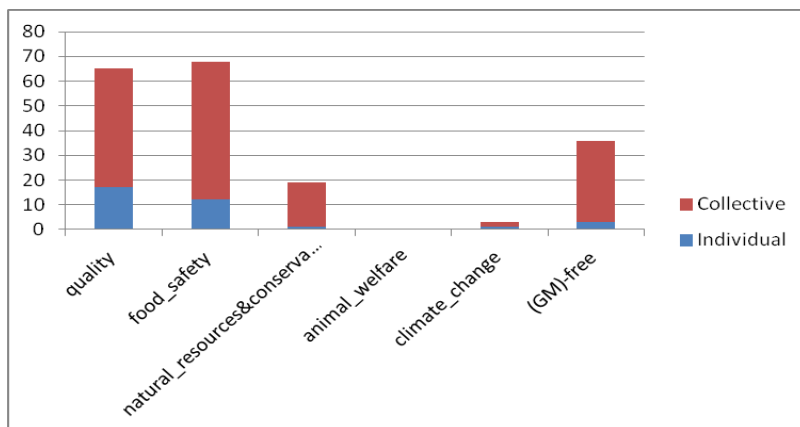
From Figure 21, based on the relative frequencies, we can see that at delivery payments are more common to the individual sales channels, while payments before are more common to the “collective” ones. The last statement is in line with our previous finding of the inferior status of the small farmers and their apparent shortage of funds for working capital and therefore need to sell in advance. Finally, other elements of the graph show low and negligible frequencies (see Figure 18b), with important notice that payments on the regular basis are more important for individual arrangements than for collective ones.



**Figure 21. Payments and collective/individual sale channels**

Source: SUFISA farms survey (RS – wheat)

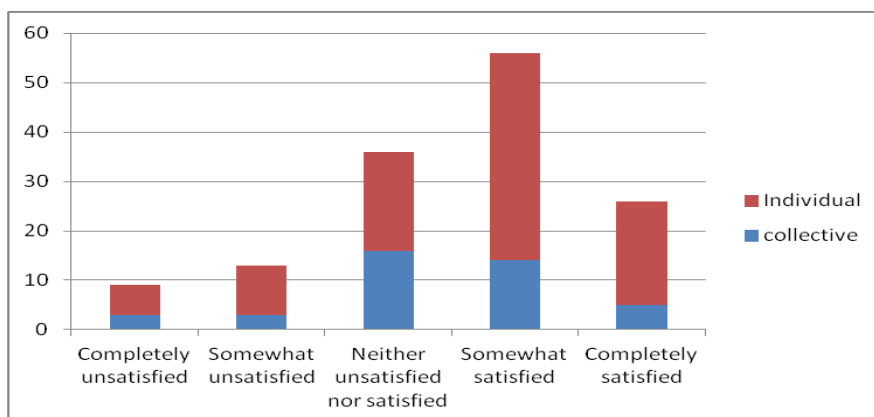
Among the relevant standards, quality and food safety are mainly imposed to both collective and individual sales channels (see Figure 22). Animal welfare standards are not mentioned at all, while other sustainability-oriented standards (such as nature conservation and adaptation to climate change) are less frequent. Producers in Serbia are obliged to implement GM free practices.



**Figure 22. Standards involved in two types of arrangements**

Source: SUFISA farms survey (RS – wheat)

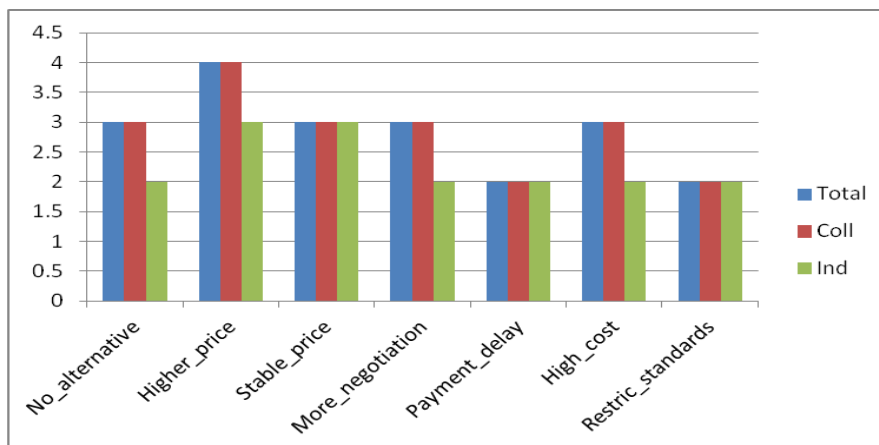
Finally, the level of satisfaction in both subsamples indicates that farmers are generally more satisfied with the sale agreements (see Figure 23). However, the specific characteristics of analysed institutional arrangements still leave a lot of opportunities for further improvements.



**Figure 23. Level of farmers' satisfaction with contract arrangement**

Source: SUFISA farms survey (RS – wheat)

The main aspects concerning benefits of existing types of contracts to farmers' sustainability are related to possibility to obtain higher prices than with some other types of arrangements (see Figure 24). Generally, our respondents report a lower level of agreement with the following statements: (1) there are delays in the payments; (2) the production/quality standards required are too restrictive; (3) this sale agreement provides more possibilities for negotiating prices. In the case of the first statement a lower level of agreement is positive for the quality of arrangement applied in practice, while the third statement addresses reduced space for negotiation that farmers have in the context of price definition. Non-existence of production/quality standards or existence of lower requests for standards implementation cannot be considered as positive.

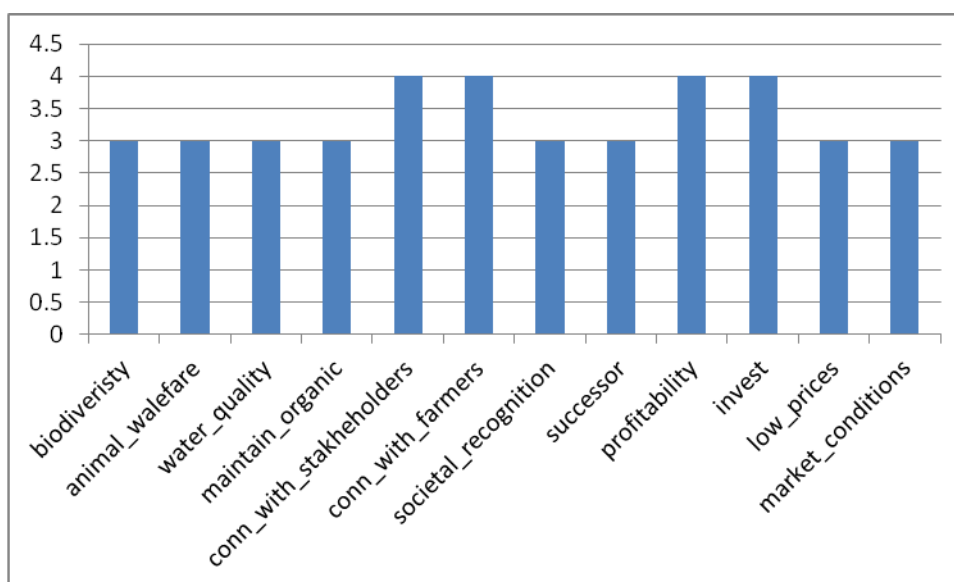


**Figure 24. Farmers' perception of overall quality of sale arrangement**

Source: SUFISA farms survey (RS – wheat)

#### **6.8.4 Sustainability: results of section C1**

This section is related to the potential impact on sustainability of sales agreement. The farmers/the wheat producers were asked to score the overall arrangement influence on farms sustainability, ranging from strongly disagree (1) to strongly agree (5). They were supposed to evaluate which factor has the strongest and which the weakest influence from the group of the environmental, social and economic sustainability factors (see Figure 25).



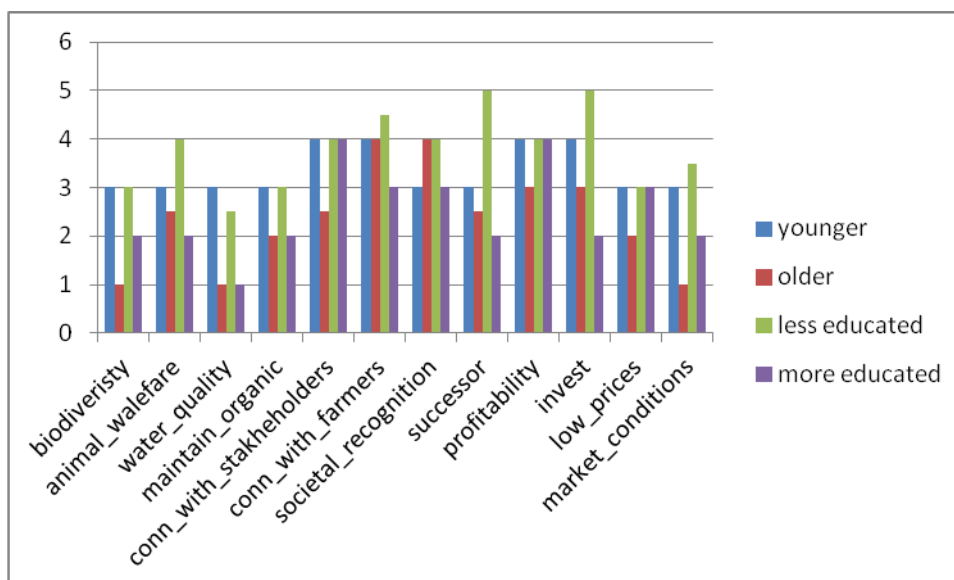
**Figure 25. The perception of farms sustainability**

Source: SUFISA farms survey (RS – wheat)

It is interesting that the predominant opinion among wheat producers is that only some social and economic factors are more important in the farm/production sustainability, while the environmental factors do not have so much influence. The linkages among farmers and stakeholders are the most

important aspect of social sustainability. On the other side, the profitability maintenance and investment opportunities are the highest scored (even higher than wheat prices and some other market conditions). However, more precise analysis could be derived if the factors that impact over the farm sustainability cross with some age and educational characteristics of the wheat producers.

The first differences could be noticed inside the environmental factors of the production sustainability. While younger producers scored these factors as medium important factors, the older ones gave higher importance to the soil quality and animal welfare. This could be the consequence of the production experience (the influence of certain soil type on the wheat production) and the fact that many of the farms are not specialized only in the wheat production but usually have some other plant production and animal production as well (the produced crops very often are used in animal nutrition). Considering educational structure, the results within this group of factors are not expected – more educated producers scored environmental factors lower than those with less education. The explanation could be that producers with higher education are acquainted with different agro technical measures which are often used in order to diminish the environmental influence.



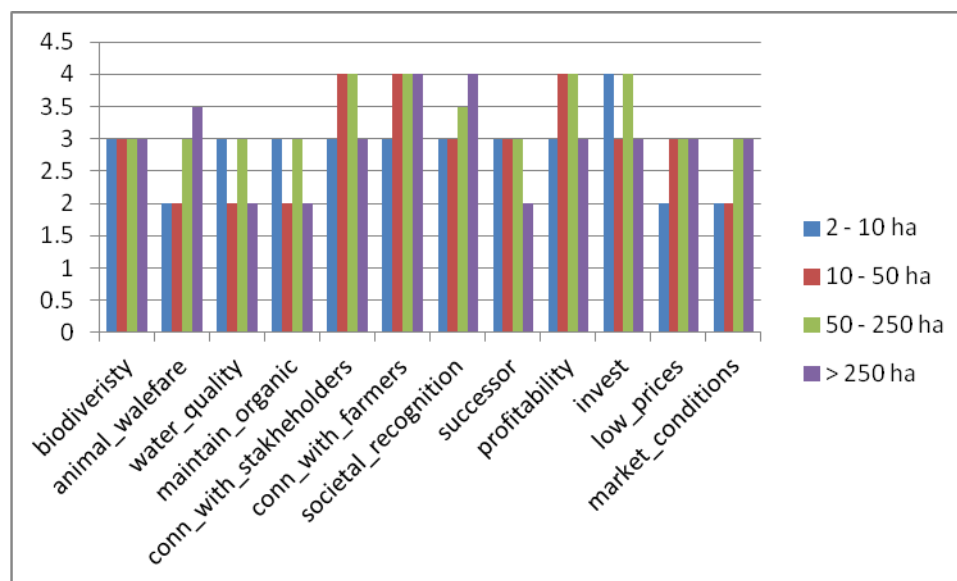
**Figure 26. Perception of farms sustainability according to the producer's age and education structure**

Source: SUFISA farms survey (RS – wheat)

Social sustainability is valued higher than environmental, but inside this group there are very large differences among different producers. The highest scores are allocated to the factor of social networking among farmers and stakeholders (young producers pay more attention to the connections to the stakeholders, and only more educated producers don't indicate the connection with other farmers as highly important). It is interesting that the older and less educated producers pay more attention to the social recognition of their farming activities (probably the influence of the tradition), while less educated producers still highly value the arable land value when the succession is in question.

Similar trends are discovered among younger and older wheat producers when the importance of the profitability maintenance and investment are in question (the highest score in both groups). However, differences are obvious when producers' educational structure is analysed: less educated producers pay

more attention to the investment potential and the market prices influences especially in the period of low prices or strong influences of changes at the market.



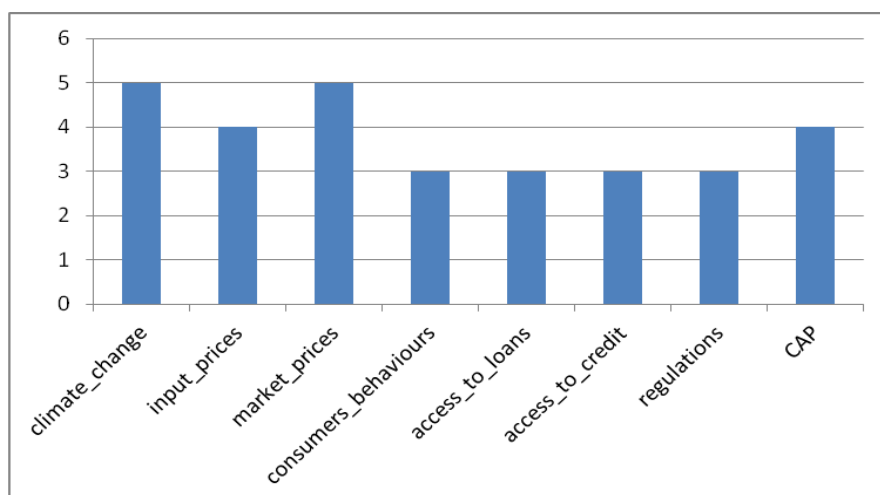
**Figure 27. Perception of farms sustainability according to the farm size**

Source: SUFISA farms survey (RS – wheat)

Environmental factors have been scored similar throughout all kinds of producers, with an exception of the animal welfare of which larger farms think of as more or the most important environmental factor of the farm sustainability. Similar case is within social aspect of sustainability, where again connections to other farmers and stakeholders are considered to be the most important. However, the small farms indicate that profitability maintenance and investments are the most important aspects of the economic sustainability (they are faced with strong competition by the large farmers). The largest farms gave higher scores on the institutional and some market conditions (these producers consider themselves as the most important players in the wheat production in Serbia and are very interested to know the EU competition).

### **Farmer's perceptions of different factors of sustainability in the future**

This section is about the wider strategies producers adopt in their farming activities. The analysis is based on the results of several questions about potential factors that can drive farming decisions, such as adverse climatic conditions, pests, and market volatility. It was interesting to find out to what extent some environmental, economic and institutional factors might influence the decisions regarding the wheat production and farming strategies. The answers were scored from 1 (not at all) to 5 (strongly influenced).



**Figure 28. Different factors influence the farms sustainability in the future**

Source: SUFISA farms survey (RS – wheat)

The overall opinion of the wheat producers in Serbia is that climate change and market prices are the two most important factors that will shape some future production strategies (see Figure 28). This is a logical result because the climate changes consequences are already visible (more often climate hazard appearance, such as drought, hail, late frosts, etc.). The answer option market prices is singled out as one of the most important factors of the future sustainability by almost all groups of producers, although that some groups, like older or less educated producers, don't know well what this factor really means. More interesting is the score on CAP, which is the next most important factor of the future strategies. The wheat producers in Serbia are more than any other agricultural producers aware of the CAP aspects once Serbia becomes an EU member (the wheat production in Serbia is highly intensive in Vojvodina and the market channels are well developed). This is especially visible within the group of larger farm size. Different groups opinion about farms sustainability in the future are presented in Table 25.

**Table 24: Different farmers groups and the factors influence on the farm sustainability in the future**

	younger	older	less educated	more educated	2 - 10 ha	10 - 50 ha	50 - 250 ha	> 250 ha
climate_change	4	4.5	5	4	4	5	5	5
input_prices	4	4	4	4	4	4	5	4.5
market_prices	4	3.5	5	4	4	5	5	4.5
consumers_behaviours	2	2	3	2	3	2	3	3
access_to_loans	3	1.5	3	3	2.5	3	3	3.5
access_to_credit	3	2	4	3	3	3	3	3
regulations	3	3	3	3	3	3	3	4
CAP	4	4	3	3	3	3.5	4	4

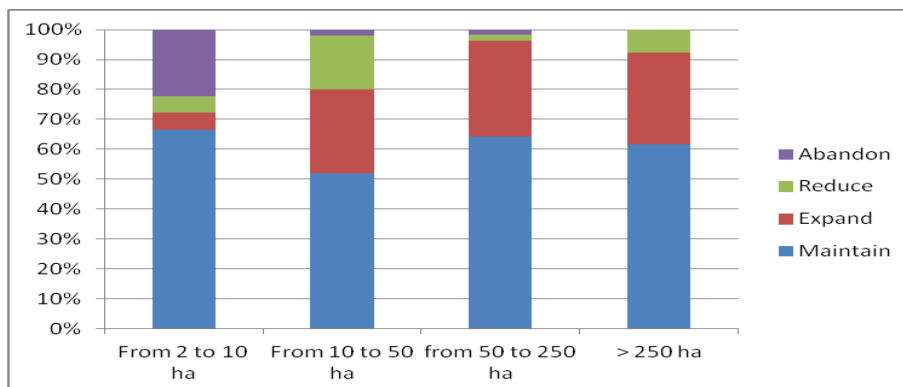
Source: SUFISA farms survey (RS – wheat)

### 6.8.5 Strategies and drivers of farming: results of section D

One of the main goals of this research is to stress out the future perspectives of wheat farmers in the Region of Vojvodina having in mind their own point of view, as well as to define the importance of different



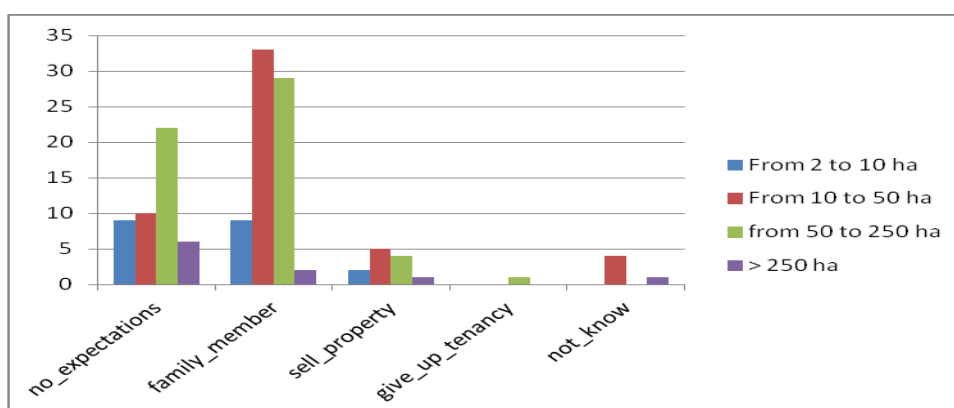
factors that will influence sustainability of farmers businesses in the long run. Farmers were asked to mark importance of different factors that were previously identified during the qualitative research such as climate change, price fluctuations (both of inputs and outputs), changing of consumer preferences, access to loans and credit, and changing regulation and policy measures.



**Figure 29. Strategies in the coming 5 years**

Source: SUFISA farms survey (RS – wheat)

In the strategic context, the surveyed farmers reported what their strategies for the development of wheat within the context of their farm business in the coming five years are. The majority of farmers reported to maintain production (Figure 29). A slightly different pattern becomes for the group of farmers with total area from 10 to 50 ha, where a higher share of other strategic alternatives was noticed. Further expansion of production is more important for larger farmers (above 50 ha) than for other groups, while the highest share of response option “to abandon farming” was reported in the group of 10 to 50 ha. When it comes to age structure of farmers, younger farmers (below 40 years) are more prone to expand farm activity, while abandonment or reducing of farm activity is more present for older farmers. It is also important to notice that among farmers from 50 to 250 ha the group of older farmers is overrepresented, and many of the interviewed farmers in this group have no expectations regarding successors. It also refers to unfavourable demographic situation (aging population in the rural areas in Serbia).

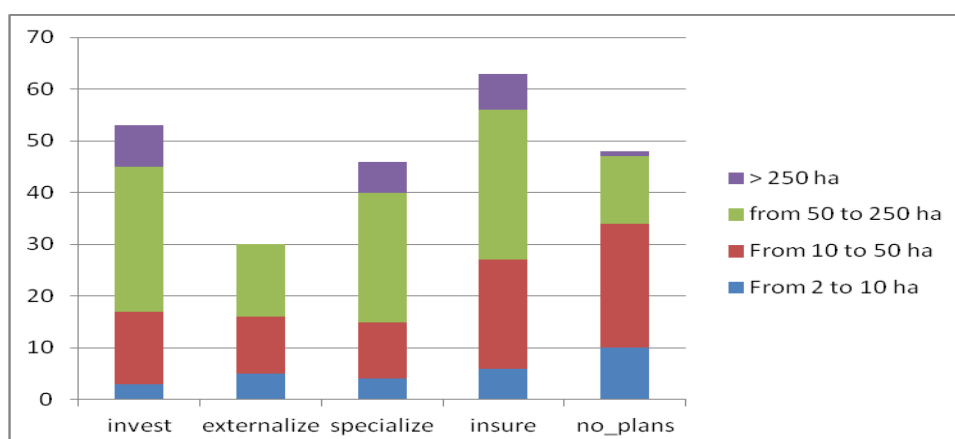


**Figure 30. Succession of the farm**

Source: SUFISA farms survey (RS – wheat)

When it comes to the specific strategies to be implemented in farmers’ production activities, our research shows that insurance and investments dominate among selected options of the interviewed wheat farmers, which can be considered a favorable result from the aspect of preserving the financial stability of farms.

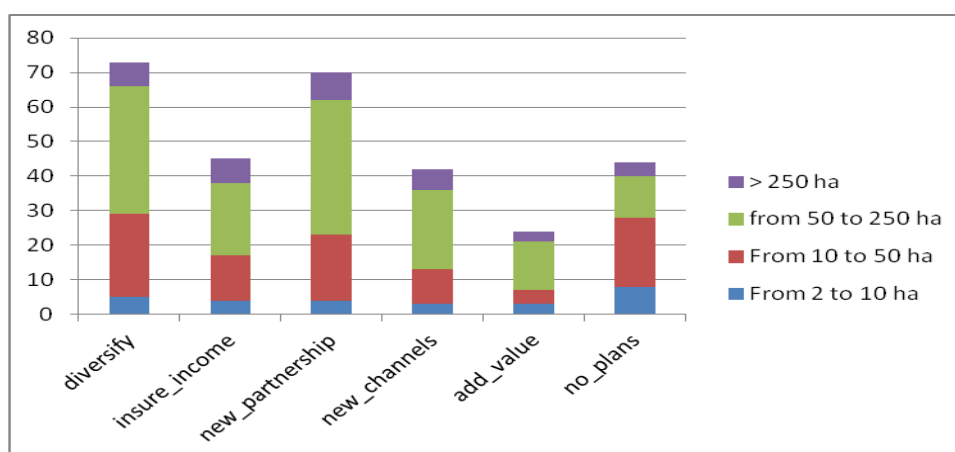
While insurance is important for future activities for all farm size groups, investments are more present in the groups of larger farmers (above 50 ha of total area). The small farms (below 10 ha) have no plans or will try to externalize production activities.



**Figure 31. Future actions regarding production plans by farm size**

Source: SUFISA farms survey (RS – wheat)

Similar to production, market plans include diversification and new forms of partnership in the context of better coordination and cooperation both among farmers and between farmers group and other food chain stakeholders in Serbia (see Figure 32). Furthermore, the active role of farmers is recognized in the area of sales channels innovation and income insurance as the strategic response to price fluctuations. However, almost one third of the interviewed farmers have no plans for their production activity in the future, while the lowest number of responses belong to farmers intentions to organize organic or other forms of production with added value.



**Figure 32. Future actions regarding market plans by farm size**

Source: SUFISA farms survey (RS – wheat)

**The main results of our quantitative research on Serbian wheat farmers can be summarized as follows:**

- Young farmers represent a slightly more than one third of our sample.
- On average, the youngest farmers belong to the group of the largest farms (44.25 years based on total area and 41.67 based on wheat area on average).

- Higher educated farmers manage the largest farms on average (around 260 ha in total and 93 ha in wheat area).
- Formal and informal arrangements co-exist, although the informal arrangements are more popular and therefore, widely accepted.
- The informal agreement at the time of sale is most represented in our sample, followed by legal contract before or during production.
- The average wheat price is higher for the group of farms from 10 to 50 ha in comparison with other farm size groups (both in total and wheat area).
- Farmers who are involved in individual sale channels managed to reach higher wheat price of EUR 0.166 per kg in comparison to the collective price of EUR 0.143, on average. The price of wheat is in most cases defined based on the market supply and demand conditions.
- Most sales agreements are made either for particular sale, or they last between 7 months and 1 year. Without stable price arrangements (in medium and long run), it is hard to run the farm business successfully.
- Most of the farmers in this sample get paid “at delivery” of the product or even “before” that, which implies standard form of price formation. At delivery payments are more common to the individual sales channels, while payments before are more common to the “collective” ones.
- Quality and food safety standards are mainly imposed to both collective and individual sales channels, while animal welfare standards are not mentioned at all. Producers in Serbia are obliged to implement GM free practices.
- Only some social and economic factors are more important in the farm/production sustainability, while the environmental factors do not have so much influence. The linkages among farmers and stakeholders are the most important aspect of social sustainability.
- The level of satisfaction in both subsamples (individual and collective arrangements) indicates that wheat farmers are generally satisfied with sale agreements.
- The overall opinion of the wheat producers in Serbia is that climate change and market prices are two most important factors that will shape some future strategies, while the CAP scoring also high.
- The surveyed farmers mainly report that they plan to maintain the existing production scale. The larger wheat farmers (above 50 ha) report that they want to expand production (it is more important for this group than for other groups), while the highest share of response “to abandon” farming was reported in group of 10 to 50 ha.
- Among farmers from 50 to 250 ha the group of older farmers is overrepresented, and many of the interviewed farmers in this group have no expectations regarding farm succession (the strong demographic problem is present).
- Insurance and investments dominate among selected strategies, while market plans mainly include diversification and new forms of partnership in the context of better coordination and cooperation.

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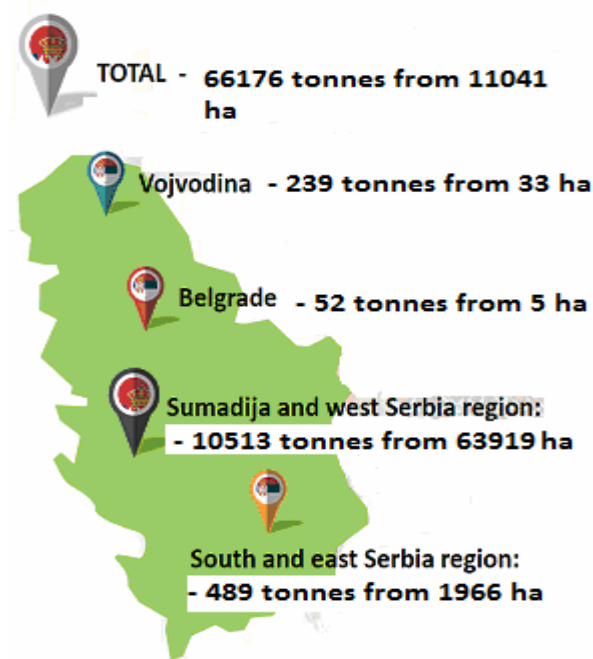
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## 7 Serbian Case Study B: Small family owned raspberry farms in the Region of Sumadija and Western Serbia

### 7.1 Case study introduction

Sumadija & Western Serbia is the NUTS 3 region and takes north-western and south-western parts of the country as well as the central area (Sumadija). It is the region of a hilly topography, mild continental climate up to mountain type of climate in the southern parts of the regions. This is predominantly rural area with a high percentage of rural population in total population (from 41% up to 100% of rural population in LAU1 unit level). The population structure is characterized by a significant share of old people in the total population (20,6%) and the high share of those who have not finished even primary school (37%) and very low portion of those with a secondary (35%) and high education (3%).



**Map 3. Raspberry production (t) and utilized area (ha) in Serbia, 2015.**

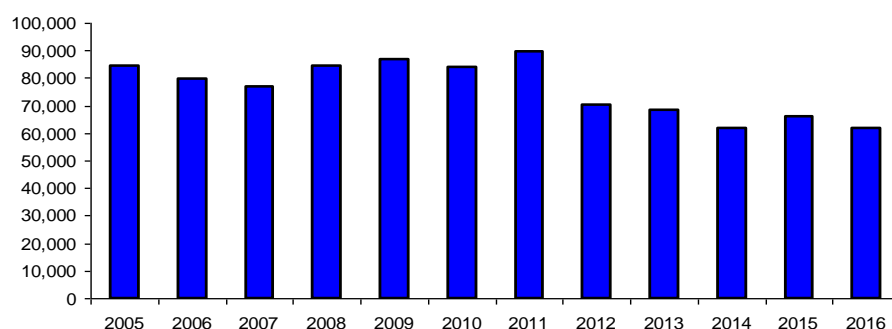
*Source: SORS data base*

Number of residents in rural areas is larger than number of urban residents only in this region in Serbia (52.6% of total population is rural). However, rural areas are characterised by small farms (average farm size is around 3ha, and there is significant portion of very small farms up to 1ha, around 12%) and diverse farm production systems. In spite to topography limits and relatively low population density (60 people/km<sup>2</sup>), the region has significant percentage of land suitable for agriculture (66%) and the proportion of agricultural arable land (67%). The agricultural potential of this arable land is high, with fertile soils and favourable climatic conditions for raspberry production. Small family owned farms are in the focus of our analysis.

Due to its high market share, global recognition and competitiveness, the raspberry production has been the most important fruit production in Serbia. This sector is also interesting due to its high potential for fresh and high value-added market development (traditional food and organic production). The Serbian raspberry supply chain holds an important position regarding the overall agricultural and rural development in the country. From the economic point of view, raspberries sector contributes in a high share of total agricultural export from Serbia to the EU and global market. Broader perspective includes the sector importance for the multifunctional rural development (development of activities connected with the storage facilities, packaging, transportation, trade, and marketing of products). It includes ethic and social aspects as well, particularly relevant for the western regions of the country. This sector generates the significant contribution to farm income in the Sumadija and Western Serbia District. Currently applied production methods are mainly traditional and with the positive environmental impact. Finally, raspberries hold the superior properties compared to other fruits regarding the health benefits (particularly high antioxidants content is recorded for Arilje raspberry).

Almost 90% of raspberry production is frozen in cold storage plants, while only 10% of it is used for processing or sale in retail stores. Most raspberries are exported in a frozen state (up to 93%). Raspberries are frozen at a temperature of  $-40^{\circ}\text{C}$  and stored at temperatures between  $-18^{\circ}\text{C}$  and  $-20^{\circ}\text{C}$  (which applies also to the transportation). Therefore, most of the raspberry production in Serbia is the part of the standard supply (value) chain. Undoubtedly the largest number of significant relationships, in this case, belongs to intermediaries, which makes them as the most important part of the network. They belong to so-called “processing part” of the food chain and consist of regional centers (cooling houses) and brokers/exporters (Radosavljevic, 2008). Significant position goes with a significant bargaining and consequently significant market power which is primarily expressed in relation to the farmers as the primary producers. There are approximate 320 cold storages with required deep freezing regime, with capacities up to 5,000 t. On the other side, it is estimated that there are about 15,000 raspberry producers (Nikolic et. all, 2012). Serbian raspberry farms are small, usually, family-owned seasonal business. Average raspberry plots are between 0.5 and 1 ha. Farmers sell their products to intermediaries, rarely directly to processing companies or exporters and usually with no further engagement.

For small farms it is difficult to take advantage of the economy of scale and its production costs are usually high. Investments in transportation and technology improvements are required to facilitate export of high-quality fresh raspberries. Also, they are characterized by the low market and bargaining power. There exist a limiting number of organizations (cooperatives) that can help farms to sell their raspberries at wholesale or green markets. The illustrative moment is that the Federation of Associations of raspberry producers of Western Serbia exists only from 2012.

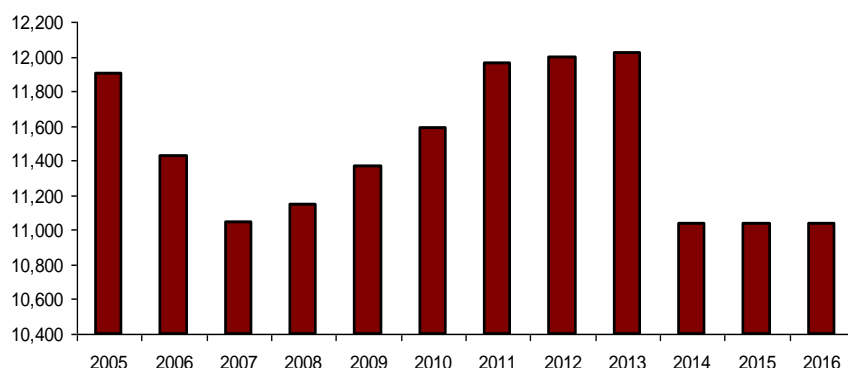


**Figure 33. Raspberry production in Serbia (in 000 tons)**

**Source:** SORS

Raspberry production in Serbia in the period 2005-2016 ranged between 68,000 and 90,000 tones (production highly depends on weather conditions). The highest production of raspberries was achieved in 2011 (89,602 t, whereas the lowest production values were recorded in 2014 (61,715 t) and 2016 (61,875 t). Figure 33 shows the movement of raspberry production in Serbia in the focused time frame.

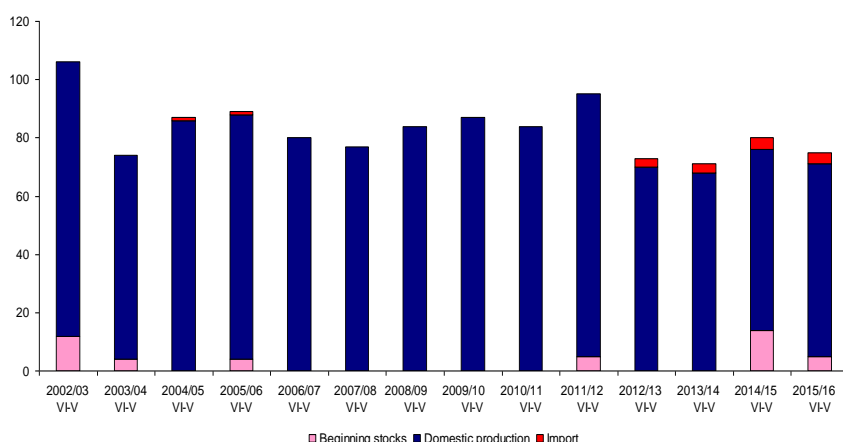
Raspberry is produced on the area covering nowadays 11041 ha, with maximum of 12,025 ha reached in 2013 (see next Figure). The following Figure also shows the trend of raspberry field coverage per year in the mentioned time frame. Infamous curiosity is that in Serbia, only 3-5 % of areas planted with raspberry are irrigated (note: open air only).



**Figure 34. Planted area (in ha)**

**Source:** SORS.

Raspberries picking in Serbia begins in late June and ends in July, depending on weather conditions and fields location. Most fresh raspberries are sold and consumed during the summer season, and only a small number is exported fresh mostly in the Western Balkan region. The fresh raspberries are cleaned, prepared and stored at a temperature of 0° C and transported in refrigerated trucks to their destinations within three days. Fresh raspberries are consumed or processed for homemade juices and concentrates. They account for less than 2-3% of total raspberries production in Serbia which includes home made products of fresh raspberries (juices, traditional food).

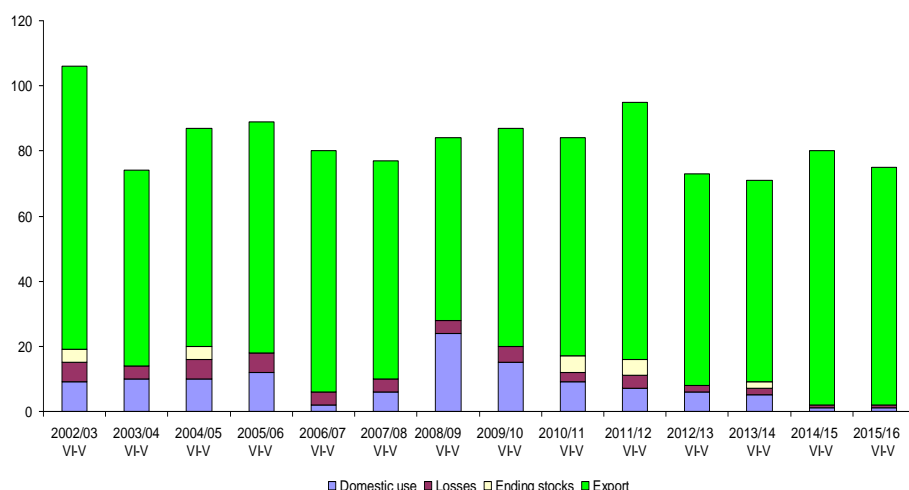


**Figure 35. Total supply of raspberry in Serbia (in 000 tons)**

**Source:** Supply utilization balance: Raspberry (<http://www.mpt.gov.rs>)



The total annual supply of raspberries in Serbia varies between 73,000-106,000 tons in 2002-2016 periods and includes beginning stocks from the previous season, domestic production in the concrete period plus the import. The total supply and its structure for the period June 2002 to May 2016 are presented in Figure 35. Next two Figures and Table show important facts of the annual (total) consumption of raspberries which is divided between domestic consumption and export. Domestic consumption encompasses domestic use in fresh and processed form, losses and ending stocks.



**Figure 36. Total consumption of raspberry in Serbia (in 000 tons)**

Source: Supply utilization balance: Raspberry (<http://www.mpt.gov.rs>)

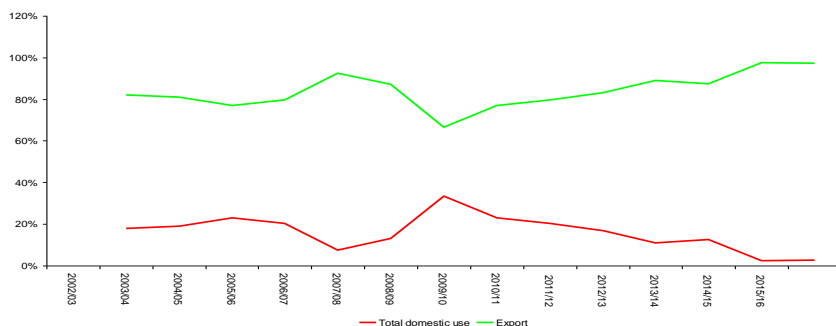
The dominant part of Serbian raspberries is exported in frozen form. A very small portion is exported as fresh. Significant spread widening can be noticed between export and domestic consumption of Serbian raspberry.

**Table 25. Domestic use and export as (%) of total consumption of Serbian raspberry**

	2004 /05 VI-V	2005 /06 VI-V	2006 /07 VI-V	2007 /08 VI-V	2008 /09 VI-V	2009 /10 VI-V	2010 /11 VI-V	2011 /12 VI-V	2012 /13 VI-V	2013 /14 VI-V	2014 /15 VI-V	2015 /16 VI-V
Total domestic use	23%	20%	8%	13%	33%	23%	20%	17%	11%	13%	3%	3%
Export	77%	80%	93%	87%	67%	77%	80%	83%	89%	87%	98%	97%

Source: Supply utilization balance: Raspberry (<http://www.mpt.gov.rs>)

Average purchase prices for raspberry show increasing trend from 2000, reaching the maximum value in 2016 of RSD 194.23 per kg of product.



**Figure 37 Domestic consumption vs export of raspberry from Serbia**

(In % of total consumption)

**Source:** Supply utilization balance: Raspberry (<http://www.mpt.gov.rs>)

Export of frozen raspberry amounted from EUR 126.4 million in 2010 to EUR 186.8 million in 2014. Average export of raspberry from Serbia in last five years reached 69,400 tons or EUR 138.5 million that is 26.3% higher than in 2013. After continuous growth in the pre-crisis period, the export recorded stagnation, fall and then recovery from 2009. This volatility is mostly due to prices of raspberry because quantity exported was relatively stable during the observed time interval (see Figure 38).

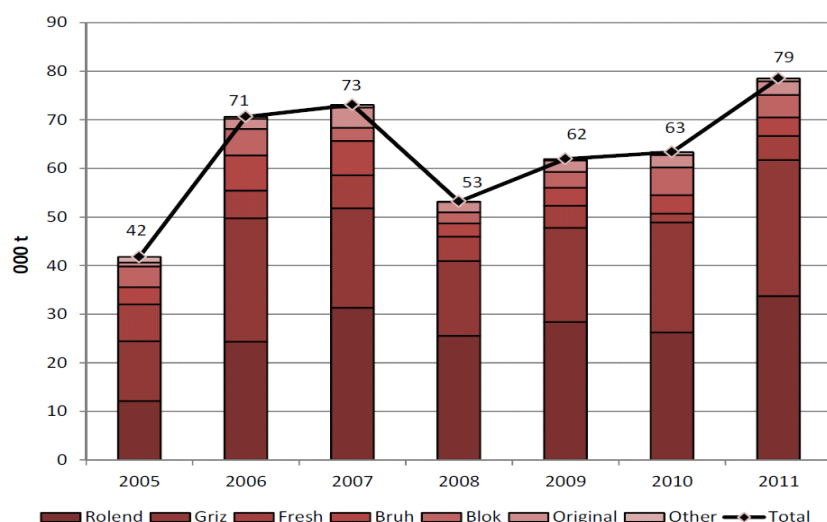
The main export destinations for the export of frozen raspberries from Serbia are Germany, France, Belgium, USA, UK and Sweden while fresh raspberry is predominantly exported to Austria and Germany.



**Figure 38. Serbia: Raspberries – Export, frozen, without sugar (2010-2014)**

**Source:** SORS and Supply utilization balance: Raspberry (<http://www.minpolj.gov.rs>)

Data are given as average exported value share by country destination in the total value of exports of frozen raspberries from Serbia. Average value is calculated for a shorter period (from 2008 to 2012) and for the values of export of frozen raspberries considering that the data of the National Statistical Office were only available as export data of frozen raspberries with sugar before that time. If we look at export by raspberries categories, it can be seen that the major part of the export of raspberries “Rolend” (41% of export of this raspberry category is an average value for the period 2005-2011). This category is followed by a raspberry “Griz” (32%), which is followed by the export of fresh raspberry (9%). Categories “Block” and “Bruh” make export share with 7% each, whereas the original raspberry is exported in small quantities (only 4% of the total export of raspberries). Detailed quantities of categories of raspberry exported are presented in Figure 38.



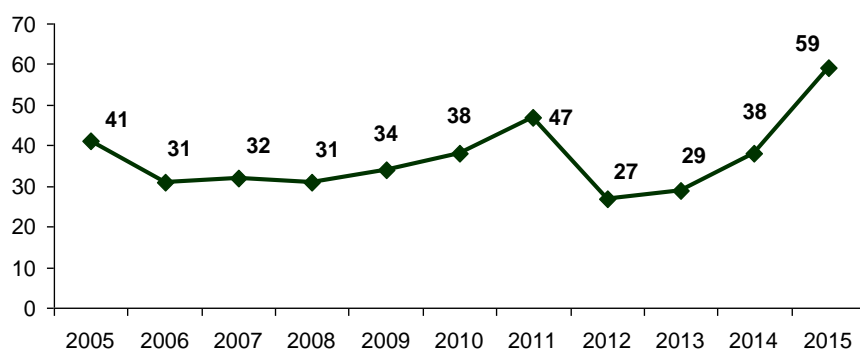
**Figure 39 Export - categories of raspberries, average 2005-2011**

**Source:** Ministry of agriculture, forestry, and water management  
Based on SORS, Report 2012.

Sale and purchase of raspberries are shown in terms of quantity and value, respectively (see next two graphs). Data are for the period from 2005 to 2015. The amount of sale and purchase on the territory of Serbia is in the range of 27,000-50,000 tons.

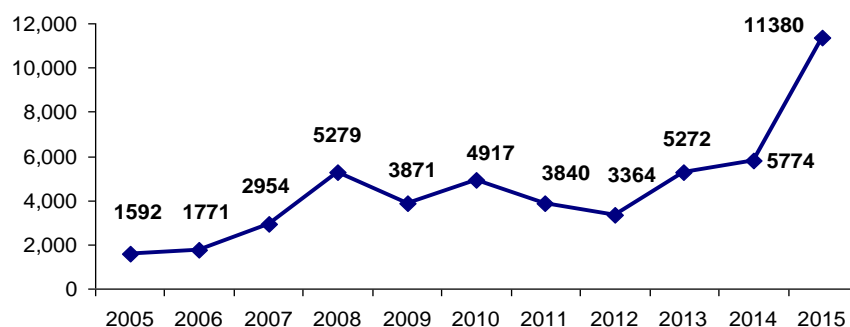
When looking at the values of sale and purchase (Figure 41), they are due to price fluctuations highly volatile in relation to the data expressed in tones. The lowest value was recorded at the beginning of the observed period when RSD 1,592 million raspberries were sold and repurchased. After that, the value of sale and purchase reached its first maximum in 2008. After the reduction in 2009, the value recorded growth reaching the new high of RSD 11,380 million in 2015.

Statistical Office of the Republic of Serbia regularly publishes information about the value of sales of raspberries at local marketplaces. In 2015, the sale of raspberries at Serbian marketplaces amounted to 124 million RSD.



**Figure 40. Raspberries: quantity of sale and purchase, 2005-2012**

**Source:** Statistical yearbook



**Figure 41. Raspberries: value of sale and purchase, 2005-2012**

**Source:** Statistical yearbook

Market prices data for fresh raspberries and other agricultural products are available from Centralized System of the market information for the agriculture in Serbia (STIPS, <http://www.stips.minpolj.gov.rs>).

Data on fresh raspberry prices are collected and provided by STIPS in the fruits category. It is important to notice that these data are available exclusively for the fresh raspberry and thus they are available only seasonally, in months when the raspberry is produced. It can be concluded that STIPS covers local supply chain of fresh raspberry.

Market prices of raspberry on wholesale and green markets in Serbia vary depending on product supply. On average, fresh raspberry is available on the market from week 21 till week 36. Belgrade market is, in general, are facing higher prices of raspberry than other cities' markets. It can be noted that wholesale prices in 2013 have increased in comparison to previous years reaching the levels between 230-500 RSD/kg (EUR 2.03-4.42).

Raspberry retail prices on green markets in Serbia differ based on the product origin, seasonal factors in production and concrete retail market. Availability of raspberry has prolonged to period between week 23 and week 44. Prices vary between 80-1000 RSD/kg, while they are significantly higher in Belgrade, especially at the beginning and the end of the season.

## **7.2 Policy and regulatory conditions**

### **7.2.1 Agriculture policy programmes targeted at raspberry production**

Besides the basic subsidies for crop production, applied in the wheat sector as well (see Section 4.2.1), the agricultural policy measures are oriented toward promotion of the high quality food through the organic production schemes implementation and improvement of raspberry producers marketing activities. Generally, more policy challenging environment has been created due high concentration of small rural farms (households) in the region which is in the focus of our research. Therefore, the agricultural policy framework is widen and more related to sustainability of rural areas and quality of rural life. Some authors argue that low productivity, small farm area, lack of equipment and machinery, insufficient state support,

inadequate and insufficient infrastructure, limited economic activities, lack of investments, low level of education and initiatives, lack of marketing and limited membership in cooperatives or associations, inadequate planning by local policymakers are the main characteristics of rural areas in Serbia (Stojanovic, Mirkovic, 2015). Furthermore, majority of small rural households form 48.8 % of total number of agricultural producers in Serbia, holding approx. 8 % of agricultural land. In most cases they are characterized as capital limited farms, belonged to the elderly, often single-person households or part-time farms with regular income outside of agriculture. Limited number of producers also belongs to the long-term unemployed population or so-called *returnees* (older, retired people, but also young families who prefer the rural lifestyle). The national strategy of agricultural and rural development particular attention pays to the small farms as the essential part of the rural economy. Their number is decreasing due to the aging of the village population, migration to the urban areas, concentration of capital in agriculture and other factors. Their importance is particularly evident in terms of resource conservation and participation in the local markets.

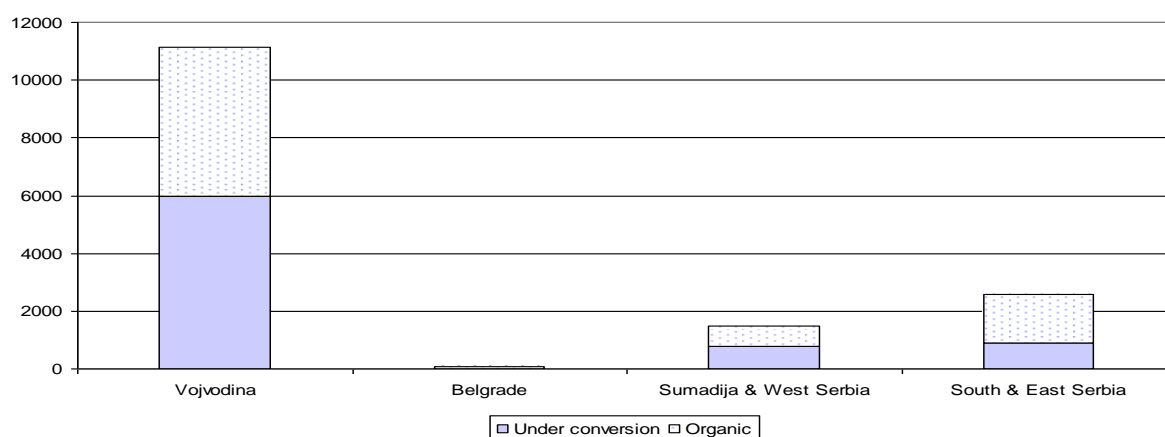
Agriculture policy in Serbia aimed at supporting competitiveness of raspberry production sector consists of numerous programmes, regulated by the Law on Incentives in Agriculture and the set of related bylaws, including: input subsidies, support for purchase of equipment, support for expansion of land used for raspberry planting, support for organic production, support for insurance from hazards, etc. More precisely, fruits (including raspberries) production sector subsidies in Serbia include the following programmes:

- Subsidies for expansion of land used for raspberry planting – refund of 40% to 55% of the total costs (up to RSD 2 million);
- Subsidies for purchase, certification and selection of seedlings – up to RSD 2 million;
- Basic support for crops production – RSD 6 thousand per hectare (from 2016 – scaled down to RSD 2 thousand per hectare);
- Refund of fuel costs – refund of RSD 50 per litre (up to RSD 3 thousand per hectare);
- Refund of fertilizers costs - RSD 10 per kg of fertilizers (ceiling RSD 2,000 per hectare);
- Refund of seedlings insurance premium – 40% of the insurance premium;
- Subsidies for purchase of equipment used in primary production – refund of 40% to 55% of the investments. Investments amounting more than RSD 50 thousand are eligible, while the total subsidies for these purposes may amount up to RSD 2 million per farm (the limit is RSD 5 million in case of investments in cold storage, which is particularly important for raspberry producers);
- Subsidies for investments in equipment used in milk, meat, fruits, vegetables and grapes production and processing – refund of 40% to 55% of investments (up to RSD 2 million per farmer);
- Support for organic fruits production - RSD 8,400 per hectare;
- Support for investments in certification of geographical origin - refund from 40% to 55% of investments;
- Loans to fruits producers – loans granted to fruits producers (for investment in seedlings and equipment) at favourable conditions (1-3 years repayment period, with fixed interest rate of 6% for loans denominated in RSD).

### 7.2.1.1 Organic production growth

Generally, government policy is governed toward promotion of high quality food offered by small producers at the local market. Particular attention has been paid to the fruit organic sector growth. Organic farming is an integral part of the national agricultural and rural development policies. The MAEP Department for Agricultural Policy and International Cooperation performs tasks related to improving the system of organic production, prepares the professional basis for drafting regulations, proposes measures to support and produce information and analysis of the situation in organic production. The Law on organic farming was established in accordance with EU requirements along with an operational and effective conformity assessment and control/inspection system on organic farming and specific research activities for organic agriculture. Accessible and demand-oriented advisory and extension services provide expert and up-to-date support to organic farmers. The strategy of organic sector development insists on export promotion with different subsidised credit lines for farmers in organic agriculture.

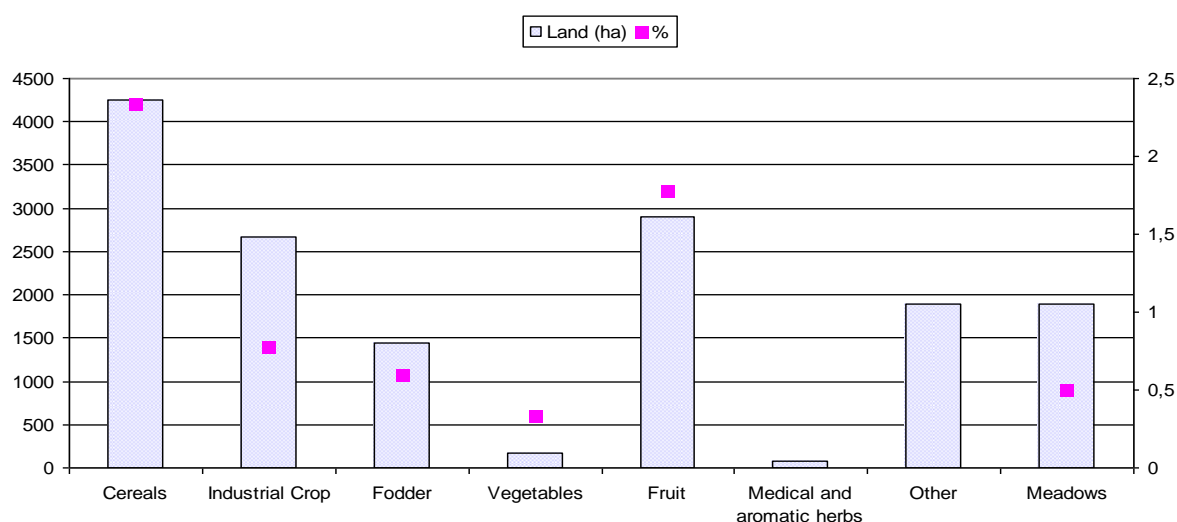
Regulation on the use of incentives for organic production gives all necessary procedures and standards for the correct use of state incentive measures in order to improve the organic production on the territory of the Republic of Serbia. This Regulation further defines the types of incentives for organic production, conditions, methods and forms required for the entitlement of these incentives and the maximum amounts of subsidies per user. Measures of this Regulation are meant to be applied on companies and farmer cooperatives and other producers. Since 2004, MAEP has provided subsidies for organic production, but over the years it has changed the type of support, beneficiaries and the amount and conditions for subsidies. The first incentives for organic production were realized in the form of reimbursements for certification costs. In 2007 and 2008 funds were planned to cover the costs of the period of conversion into organic production. Starting from 2012 the operators can apply for reimbursement of 50% of total certification costs; however, conversion period costs were not eligible. In the beginning of 2013, the Law for subsidies in agriculture and rural development and the Rulebook which determines subsidies for organic production have been adopted. The subsidies were determined by direct payments on 1ha and were increased by 40% compared to the conventional production (basic incentives in organic crop production in the amount of 8,400 RSD per hectare, plus incentives for plant nutrition and inputs allowed for use in organic plant production in accordance with the regulation governing organic production methods and fuel purchase).



**Figure 42. Organic sector: land under crop production - in conversion and certified, 2015 (ha)**

Source: (MAEP, database)

Potentials are related to the possibility of development of rural areas through development of competitive organic production, and retention and return of the population. MAEP maintains a database on organic production, which is based on the annual reports of authorized control bodies. Organic raspberry farms produce quantities of high quality food with a rational exploitation of natural resources and preservation of the environment. Organic agriculture is a sustainable, natural alternative for the intensification of production methods and presents a production management system that promotes the recovery of ecosystems. Encouraging fact is that the land under organic production in Serbia is constantly growing, in fruit sector particularly in raspberry production. According to the data, Vojvodina region leads in organic sector development in Serbia, while the region in the focus (Sumadija and West Serbia) lags behind (Figure 42). However, area under fruit organic production covers almost 3000 ha (about 2% of total land devoted to fruit production in general). Berries are predominantly grown in fruit sector, and in the berries category raspberries are the most important.



**Figure 43. Land under crop organic production - total (ha) and share in the total land, 2015**

Source: (MAEP, database)

The strengths of the organic sector are seen as follows: National Action Plan in place; Legal framework improving; Accreditation Body of Serbia has assessors trained in organic farming; Awareness of need for quality high in many industries; Large areas of agricultural land not polluted and not intensively cultivated, making conversion faster and easier; Positive opinion on organic farming among academia, many farmers, and consumers; Substantial interest of international donors; Systematic education and training; Close relations already existing with organic markets in Germany, Austria, Switzerland, and The Netherlands; Free trade agreements (EFTA, CEFTA, Russian Federation, Belarus, Turkey) with a great potential for organic sector development. However, Serbian organic sector has faced with numerous problems related to: Sector and domestic market are small; International (EU) markets are insufficiently exploited; Insufficient cooperation of actors in value chain; Small farms, not cooperating and inappropriate; Sector at all levels severely underfinanced, only marginal subsidies marked; Data base on organic agriculture processing and marketing weak and not transparent; Farms cannot develop to the level of international compositeness; Sector fails to be acknowledged at the political level as the driving force in agricultural development; Politics does not sufficiently recognize organic farming in restructuring the agricultural sector in the process of EU accession; Sector cannot build up international relations and cannot penetrate suitable markets;

Sector will be marginalised by developments in other countries, offering similar range of products; Actors do not respect accepted EU business systems and are excluded from major international trading.

Civil society has taken active participation in the organic production development. The most active NGOs in the sector are Serbia Organica, defined as an umbrella organisation of organic producers in Serbia. It is committed to developing organic farming and organic market in Serbia. Established in May 2009, it is an independent non-governmental organisation initiated by organic agriculture sector stakeholders. Serbia Organica provides a hub for the entire organic agriculture sector in Serbia. Their mission is to make organic farming stable and competitive on both the national and international markets. Serbia Organica strongly cooperates with MAEP, and the main cooperation topics are: Provision of opinion and suggestions related to normative activity; joint promotion of organic production; Exchange of opinions and positions in the field of organic production; Participation in training and informing owners of registered agricultural households, on the significance and opportunities in organic production, etc. Other associations, NGOs and cooperatives in the sector are also supported and different centres for organic sector development were established.

### **7.2.1.2 Improving Market Efficiency and Implementing Community Standards**

The important set of measures is implemented in the area of market efficiency improvement and implementing of community standards. The measures are focused on: (1) Investments in agricultural holdings to restructure and upgrade to the EU standards; (2) Investments in processing and marketing of agriculture and fishery products to restructure and upgrade to the EU standards.

The implementation of agricultural standards in Serbia is mainly forced in the context of the EU accession process and will be supported by the IPARD programme. The MAEP also uses incentive funds for introduction and certification of safety system in food production in Serbia. For example, during the 2008, the MAEP organized the promotional action "Think in time". By this action they wanted to raise consciousness on consumers' rights to this kind of protection and the importance of having a documented quality system for food consumers. However, the practice of agricultural producers is not significantly improved and, as far as raspberry sector is concerned, the most of standards are forced by foreign markets regulations. The table below summarize the implementation of standards in Serbia and compare it with the practice in the neighbouring countries.

**Table 26: Implementation of standards in Serbia and neighboring countries**

	<b>ISO 9001</b>	<b>ISO 14001</b>	<b>ISO 22000</b>	<b>GLOBAL G.A.P.</b>	<b>BRC</b>	<b>PDO/ PGI/TSG</b>	<b>Demeter</b>
<b>Albania</b>	167	34	7	0	1	0	0
<b>Bosnia and Hercegovina</b>	794	141	17	269	2	0	0
<b>Croatia</b>	2,636	828	97	141	14	13	1
<b>Macedonia</b>	399	131	25	14	1	0	0
<b>Montenegro</b>	118	24	7	0	0	0	0
<b>Serbia</b>	2,366	762	193	281	37	0	0
<b>Slovenia</b>	1,993	468	19	22	9	25	27
<b>WBC Total</b>	<b>8,473</b>	<b>2,388</b>	<b>365</b>	<b>727</b>	<b>64</b>	<b>38</b>	<b>28</b>
<b>Bulgaria</b>	5,378	1,373	244	17	29	7	2
<b>Hungary</b>	7,186	1,955	137	957	121	15	19
<b>Romania</b>	18,450	8,744	1,014	46	51	4	1

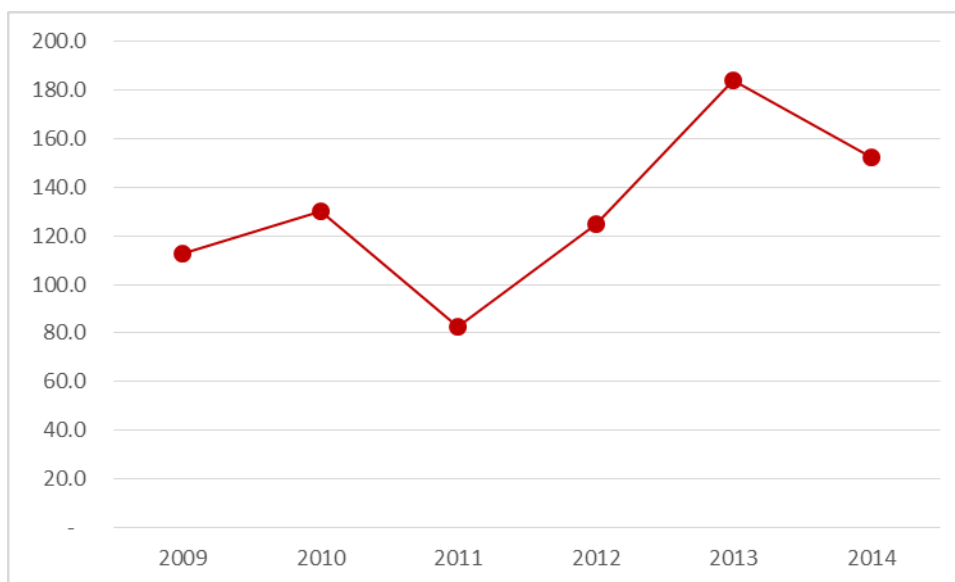
Source: Dorđević, Čockalo, Bogetić & Bešić (2015): Implementation of Certification Schemes in Serbian and Neighbouring Countries Agri-food Industry, DOI: 10.17626/dBEM.ICoM.POO.2015.p087



Although the implementation of certification schemes in agro-food industry is of great importance, unfortunately, food companies in Serbia are not generally sufficiently interested to implement certification schemes. The main reason is that most of Serbian food products are produced for the domestic or regional markets (the Western Balkan countries). The standardization process is mainly initiated by international organizations (USAid, SIEPA, EU Funds etc.). However, the situation in the raspberry production is slightly different as our producers export most of their products, and therefore they are obliged to implement international standards in production and trade.

### 7.3 Market conditions

Negative trends in raspberries production in Serbia are explained by unfavourable structure of farms (small farms, deterioration in the age structure of farmers, etc.) and high volatility in prices. As shown in Figure 44, producers in Serbia are facing high volatility of raspberries prices payable to them. Standard deviation of USD per tonne raspberries prices in Serbia from 2009 to 2014 was by 25% higher than in Poland, which is one of Serbia's main competitors in this sector. Uncertainty and unpredictability coming from high volatility of prices discourages investments into production, storage and processing facilities. High volatility of raspberry prices in Serbia is the consequence of the market structure, where the buyers/resellers of raspberries exhibit stronger position than producers. This disequilibrium may be to certain extent reduced by increase in state support programmes targeted at acquisition and construction of cold storages by raspberry producers and cooperatives, so they can be more flexible in terms of the time of sale of their products.



**Figure 44. Price of raspberries paid to producers in Serbia (RSD per kg)**

Source: Report of the Ministry of Agriculture of Serbia, June 2015

### 7.3.1 Access to markets

#### 7.3.1.1 Export promotion

The Development Agency of Serbia (Razvojna agencija Srbije - RAS) helps companies in carrying out business and investment activities in Serbia. This organization conducts research and provides resources to foreign investors to make more informed decisions and to successfully carry out the investment. The agency provides practical assistance to importers of goods and services in Serbia in terms of all the necessary questions. Services provided include the following activities: (1) The Research and analysis of the business environment in Serbia; (2) production of information sources that would allow foreign companies to operate more easily in Serbia; (3) help companies and investors in obtaining permits and licenses, Serbian exporters in international markets and Serbian companies to maximize their competitive advantage; (4) providing advisory services to the Government in terms of possible changes to the legal and regulatory framework relating to investment and exports. It also organizes business visits abroad, in cooperation with state agencies. The aim of these visits is not only to increase sales and profits, but also the training of domestic exporters. The visits to foreign companies are also organized, the local companies could learn about new products, technologies, trends, or packages. Also, through the organization of seminars on these journeys obtained the necessary information about the market and way of doing business with companies from these countries. Another service provided by RAS is organizing visits of foreign customers for domestic companies.



The cover page of RAS publication - Serbian Food Industry,  
<http://ras.gov.rs/uploads/2016/09/food-brochure-small.pdf>

Illustration - What is written about the sector in the focus in the RAS publication?

Fruit production is one of the key sub-sectors of Serbia's economic development and therefore is given a strategic treatment by the Government of Serbia. With fruit export of 57.6 euros per capita, Serbia is on the 13 place in the world, considering data from 2014. In 2015 export of Serbian fruits amounted 526.1 millions of euros. Serbia is largest provider of frozen fruit to French and Belgium market, and the second largest to the German market in 2015. In 2015 Serbia accounted for more than 21% of entire world raspberry production. With around 79.000 tons produced and export revenues amounting to \$270 million, Serbia was the largest exporter of raspberries in 2015 globally.

### **7.3.1.2 Cooperatives and support to the producers groups**

Cooperatives in Serbia have long history, evolving from big traditional families in XIX century to the contemporary social networked organizations (second half of XX century) and even private companies acting like coops (newly established cooperatives in XXI century) (Krasavac and Petković, 2015). Although cooperatives have a long history, some authors argue that the cooperatives registered under the Cooperatives Act and listed in the commercial register as Cooperatives in the Western Balkans Area can be divided into two big groups. The first group are pseudo-cooperatives, and the second are true cooperatives. "Pseudo-cooperatives" can also be divided into two groups. The one is the so-called "old cooperatives" where farmers do not have the right to administer, but instead the employees do this, and the other, the "private cooperatives" are registered as cooperatives but are really private companies owned by one or several individuals (Živkov, 2013).

Market chains are underdeveloped and in the most cases they are short and do not include small-scale farmers. Due to the specific model of agrarian question solving (so-called the cooperative model) implemented in the socialist era, cooperative sector in Serbia is constantly faced with numerous problems.

The cooperatives of the new generation have been established mainly by fruit-growers, to whom association was the next necessary, logical, economically inevitable step towards better access to the market. However, the activity of producers groups (nor necessarily organized in the form of cooperative) is seen as an alternative for better performance and organization of fruit producers.

### **7.3.1.3 "Ariljska malina" - product with designation of origin**

In the course of 2009, one name of origin was registered as "Ariljska malina" (Raspberry from the Village of Arilje). The origin of food products marks a higher quality and guarantees that the specificity and quality of the product is result of climate, soil, special breed, variety, etc. Tradition, knowledge and skills in Raspberry from the Village of Arilje are passed down through generations. Serbian Red Raspberries are prized for their colour, flavour and firmness. Due to content of carbohydrates, vitamin c, antioxidants, organic acids, anthocyanins and elagic acid, this fruit is often advertised as with the specific nutritional and health properties. Generally, raspberries from Serbia have a good reputation. Producers and other stakeholders are considering promoting this Geographical indication (GI) produce outside of Serbia with the neighbouring countries as the targeted markets. However, the willingness to pay is slightly higher for organic raspberries than for GI labelled raspberries. This could imply that a combination of strategies, rather than focusing on GI labelling only, may be more beneficial for Serbian producers (Ivana Radich & Maurizio Canavari, 2014). The export of fresh raspberry is just in the initial phase in general, and protecting geographical indication of raspberry from Arilje also in the EU is seen as a good opportunity for the whole western area of the country.

The project „Arilje raspberry“ was funded by European Union, within Regional Socio-Economic Development Programme 2 (2009-2011). Project partners were municipalities of Arilje, Lucani, Ivanjica and Pozega, Regional Development Agency „Zlatibor“ Uzice, Innovation Centre for Agriculture Arilje, General Association of Entrepreneurs Arilje and Bioagicoop Bologna, Italy. The aim of the project was to increase competitiveness of SMEs active in the production and processing of raspberries in Western Serbia and

achieved results can be presented as follows: (1) totally 200 farmers in the region of the Arilje Raspberry were certified in GLOBALG.A.P standard; the mechanism for monitoring and control in safe food production was established (GLOBALG.A.P. standard for a mandatory analysis of water, soil and fruit); (3) commercial links for fresh fruit markets in 5 countries were created. The main programmes in the foreign aid support to the berry sector development in Serbia are analysed below.

### **7.3.2 Internationally supported programmes**

Investigation of international programmes implemented in fruit (berry) sector in Serbia showed that foreign aid was generally governed toward institutional development and private sector straightening. One of the first internationally supported programmes was related to “Improvement of work organisation of farmer’s cooperatives in Serbia based on Norwegian model” (Norwegian support to Serbia, started in 2001 covered the issue of cooperation in Serbian agriculture - EUR 1 million). The purpose of the project was to improve the work of new and existing cooperatives and farmer’s associations according to the Western European - Norwegian model. Key results were the following: 1) Achieved strengthening of agricultural production in Serbia through revitalization of eight agriculture cooperatives and creation of new modern organizations of agricultural producers according to the European principles; 2) Realized trainings on: establishment and operation of modern agricultural cooperatives; marketing and trade; knowledge transfer to advisory service and agriculture cooperatives and their strategy; 3) Hand books and manuals for establishment of cooperatives developed; 4) Baseline analysis on agriculture cooperatives in Serbia prepared; and 5) Strategy on agriculture cooperatives in Serbia prepared.

Project of a particular interest in the context of fruit sector analysis is related Support to the Fruits and Berries Sector in Southern Serbia (Denmark donation). This programme has supported five fruit value chains for domestic and export markets. This has been a very relevant project as Serbia has particular competitive advantages in the fruit sector. The project started at the end 2010 and ended in 2014. It provided technical assistance (EUR 4 million) and grants (EUR 5.3 million) through two calls for applications per year.

Currently, the USAID’s Business Enabling Project helps the Serbian government to increase the competitiveness of the Serbian economy and its private sector by streamlining the business enabling environment, improving public financial management, and strengthening financial markets. It is a seven-year initiative launched in January 2011. The Project activities are based on priorities identified by the private sector. Particular attention has been paid to the financial sector development as a precondition for sustainable economic activity. The project aims at:

(1) Improving access to finance for small and medium-sized enterprises and sole proprietors (SMEs) - Empower service providers to support lending by providing, support for improving the profession of real estate appraisers. Assist the Ministry of Economy in establishing the SME Council and implementing the SME Development Strategy, in particular in terms of improvements to access to finance and business regulation. Public outreach on the development of financial markets and their role in economic growth and poverty reduction. Assistance in improving the dissemination of all information on SME financing. Support the enhancement and proper use of accounting for micro-enterprises and SMEs.

(2) Developing a regulatory framework for non-bank financial institutions (NBFIs): Assist the Government, National Bank, and financial sector to develop a regulatory and supervisory framework for non-bank

financial institutions. Provide expertise and facilitate dialogue on NBFi legislation. Assist in drafting legislation to improve leasing as an alternative source of financing for SMEs.

(3) Improve the efficiency, monitoring and transparency of state aid: Assist the Ministry of Economy and Ministry of Finance in reforming financial support mechanisms for SMEs. Prepare recommendations for the design of new state aid programs or improvement of existing ones, as well as recommendations for the management of state aid programs.

(3) Developing a legal framework for Commodity Exchanges: Technical assistance in finalizing a regulatory framework for commodity exchanges.

(4) Strengthen In-Court and Out-of-Court Credit Enforcement: Advocate for and assist with improvements to laws and regulations that will improve the regulatory framework for collateral enforcement, particularly out-of court enforcement. Assist in continued improvements to implementation of in-court enforcement. Continuing collaboration with other donors (such as GIZ) in providing support to the Enforcement Officer profession and assisting their Chamber in additional capacity-building efforts.

Previously, the agribusiness sector in Serbia was supported under the USAID Agribusiness Project (2007-2012). Particular attention was paid to the berry fruit sub-sector. Project identified berry sector as a rare source of steady income for growers and the processing industry in western Serbia, where the berry industry is a driving force for agriculture and regional economic growth (USAID Serbia Agribusiness Project – Project Completion Report, 2012). The majority of the berries grown in Serbia are old varieties which are usually suitable only for processing and not for the fresh markets. These varieties are grown in open fields, with outdated technology, and as a result the farms have poor yields and low quality fruit. About 90% of all berry fruit produced in Serbia is exported. Although the global demand for fresh fruit grows continually, due to consumer interest in a healthy diet, the exports of raspberries, blackberries, currants and blueberries for the fresh market were non-existent for Serbia at that time. Early efforts to move raspberry production to lowlands, production consolidation and/or vertical integration, and the supermarkets' growing share of total berry sales were other major characteristics of the sector. Project supported the development of the Fresh Berry Fruit Value Chain in Serbia. The significant assistance was given to improvement of planting material – nursery development, through linking local nurseries with international breeders and licensees, and support for the testing of new varieties. The development of berry fruit industry associations was also strongly supported and several international trade missions and trade show exhibits were organized. The processor/exporter marketing capabilities and export market linkages were in the focus of the project activities as well. The processors were assisted to adopt, and become certified in, relevant international quality and food safety standards and traceability requirements.

## **7.4 Key conditions faced by small family raspberry producers**

The key conditions are derived from the literature review and going to be discussed with the focus groups participants for the Raspberry CS in Serbia.<sup>10</sup> The importance of selected conditions is already confirmed in the discussion with the experts selected for interviewing.<sup>11</sup> The key conditions faced by raspberry producers are summarized in the table below:

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<sup>10</sup> Only the first conclusions are described in the draft report.

<sup>11</sup> Totally five interviews with sector representatives were conducted.

	Key condition	Explanation
1	The general conditions related to the agricultural sector functioning in Serbia (mentioned in the Wheat sector as well).	The agriculture budget varied in size with clear indications of deviations in its structure from the EU model. Generally, trend of decreasing of budgetary expenditure for food sector and rural development in last five year exists. The largest part of the funds is still spent in direct support measures (mainly for input subsidies).
2	Unorganized producers/farmers and weak market position connected with poor management capacity	Raspberries are susceptible to numerous diseases and insects (including spotted wing drosophila, a new invasive fruit fly that infests the fruit), require a great deal of labour for hand-harvesting fresh-market fruit (machine harvest is an option only for berries that will be processed and on huge farms, industrially organized), and have a very short shelf life. Therefore, the production of a good crop from year to year requires careful management (both in production and marketing areas).
3	Standards implementation	The standardization process is mainly initiated by international organizations (USAid, SIEPA, EU Funds etc.). However, the situation in the raspberry production is slightly different as Serbian raspberry producers export most of their products, and therefore they are obliged to implement international standards in production and trade. Even small farmers sell their products throughout the intermediaries.
4	Consumer preferences related to traditional and organic raspberry	The willingness to pay is slightly higher for organic raspberries than for GI labelled raspberries. This could imply that a combination of strategies, rather than focusing on GI labelling only, may be more beneficial for Serbian producers.

## 7.5 Key strategies adopted by small raspberry producers and their impact on performance

The table below shows the most commonly used/preferred strategies in risk control and mitigation in the Serbian small family raspberry sector<sup>12</sup>:

	Key strategies	Explanation
1	Straightening of agricultural	The weakest position in the Serbian food chain belongs

<sup>12</sup> The first conclusions are described.

	producers organizations	to the farmers. They are unorganized, fragmented and left without adequate representation in different bodies responsible for governance. The crucial role in the sector development is devoted to the producers' organizations (or market players that can organize efficiently and effectively small, fragmented producers).
2	Part-time farming	Raspberry production can be a good fit for small farms, as a small planting of raspberries can provide significant income and equipment needs are quite modest. Therefore, part-time farming seems to be a good alternative for small family owners in the region investigated.
3	Innovation and technology improvement	Regardless the size of farm, the production systems have to be improved significantly in the future. The crucial role is devoted to educational programmes supported either by government or municipalities in Region of Sumadija and West Serbia. Particular attention should be paid to the food quality standards implementation.

## 7.6 The key strategies and the raspberry sector performance - SWOT analysis

The following table illustrates the key internal strengths and weaknesses, as well as external opportunities and threats that influence the small, family owned raspberry farms performance and strategies applied in the practice:

The strengths	The weaknesses
<ul style="list-style-type: none"> <li>➤ Good soil and climate conditions for fruit production.</li> <li>➤ Long traditions in producing fruit.</li> <li>➤ GMO free production.</li> <li>➤ Sufficient sources of water for irrigation.</li> <li>➤ Available workforce.</li> <li>➤ Developed seed production.</li> <li>➤ Biodiversity -existence of varieties of cultivated plants.</li> <li>➤ High competitiveness on regional markets.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Weak vertical and horizontal links of domestic market.</li> <li>➤ Decreasing competitiveness at international markets.</li> <li>➤ Lack of producer organisation.</li> <li>➤ Small number of market oriented producers with intensive production and modern technology.</li> <li>➤ Small export share of processed products.</li> <li>➤ Low level of state support.</li> <li>➤ Fragmentation of the land use.</li> </ul>

	<ul style="list-style-type: none"> <li>➤ Low level of technical and technological equipment (drying and storing of crops, packing facilities, cooling of fruit, etc.).</li> </ul>
<b>The opportunities</b> <ul style="list-style-type: none"> <li>➤ Promotion and organization of domestic production.</li> <li>➤ Readiness of consumers to use domestic products.</li> <li>➤ Access to foreign markets.</li> <li>➤ Establishment of producer organizations.</li> </ul>	<b>The threats</b> <ul style="list-style-type: none"> <li>➤ Climate change - natural disasters such as floods, earthquakes, landslides, forest fires, droughts, heat waves, prolonged winter etc.</li> <li>➤ The economic crisis has influenced prices recorded in the international markets, and also transferred the negative influence on the domestic market.</li> </ul>

## 7.7 The Results of Focus Groups Discussions and Workshops

### 7.7.1 Introduction

The qualitative research of food chain stakeholders' attitudes towards sustainability, conditions and strategies was conducted using form of focus groups discussion defined by the project activity leader. Two focus groups were conducted in May-June 2017. In the FGD, only raspberry producers from the Arilje region took place in interviewing. It is area with traditionally represented raspberry producers where the effect of local milieu in the rural development is broadly used. The interviews were held in the premises of the Municipality of Arilje and lasted about 2 hours for each FGD.



Key words: FGDs - Raspberry sector (TagCrowd) - Translation: proizvod, preradu, prerađeni, poluproizvod (product, processing, processed, semi-final); sirovinu, izvoznika, nastaviti (export, raw materials, will continue).



Totally 6 producers were asked to participate in the first FGD, and five of them were involved in the discussion (Table 28). All producers belong to the rank of small family farms (up to 3 ha). The second group consisted of manufacturers with storage capacities (cold storages) in their own possession. Four selected manufacturers were invited to the discussion, and only two participated. It is well-known that it is hard to involve stakeholders other than producers in open discussion, and our team faced with the same problem during this activity realization. However, the insights given by manufacturers are very valuable for our research. Additionally, all results obtained during the discussions were confirmed in stakeholders' workshop which took place in Belgrade at the beginning of June 2017.

**Table 27:** Basic information about FGD Participants

Organisation	Subgroup	Status
<i>The 1st FGD</i>		
Producer / organic raspberry	Producer	Participated
Producer, member of the Local council for agriculture in Arilje	Producer/policy maker at the local level	Participated
Producer, president of the Local council for agriculture in Arilje	Producer/policy maker at the local level	Participated
Producer, cooling storage owner, former president of the agricultural union in Arilje	Producer/trader	Participated
Small family producer	Producer	Participated
Producer	Producer	Invited to participate
<i>The 2nd FGD</i>		
Producer / organic raspberry / cooling storage owner	Producer/trader/	Invited to participate
Trader	Manufacturer/Trader	Participated
Trader	Manufacturer/Trader	Participated
Trader	Manufacturer Trader	Invited to participate

### **7.7.2 The starting point - "Do we talk about the same concepts?"**

Our interviewees mainly addressed meaning of sustainability from the state (macro aspect) and producer point of view (individual aspect). One cannot ignore the impression that the participants in the discussion

were faced with blindness of the long-lasting approach applied in the period of socialism (before the year 2000). State was responsible for everything, ministry was asked to define strategy and what was sustainable - to define the best concepts for the sector survival both in the terms of internal conditions (the role of agriculture in the development) and international competition (role of agriculture in foreign trade).

**A statement:** *"But we need to get some guidelines, someone must be standing behind it, so if the state stands behind it's like the development plan. Let somebody do an economic study and say in which direction we should go."* (Manufacturer/Trader)

At the same time, this can be a clear indication of the lack of coordination. In the Serbian Agriculture Strategy drafted in 2004 (the first strategy that was not defined in the context of the socialist plan - what, how much and for whom to produce) it is clearly stated that producers are responsible for their decisions and no one will make decisions in their name any more. This obviously turned to the opposite. Despite numerous attempts to establish an agricultural market information system, to exploit research related to the development of market conditions and make it publicly available to producers, producers are still left on their own, unwilling to compete in the new circumstances governed by "the invisible market hand". Some of the participants recognized importance of the coordination between local/regional and national level, but all of them generally put too much attention to the role of principal decision maker - minister (it is expected more than it is written in the description of his job). Due to the sector importance for the overall economy, the impact of the lobby groups is very strong.

**The statements:**

*"We are very interested in this topic, we started the establishment of a Working Group and we had a meeting 10 days ago with the Minister."* (Producer/trader)

*"It is important to create a good Working Group that will address these problems. It should start from producers; it should include all stakeholders' representatives in the chain. We cannot discuss even without cold storages companies or exporters."* (Producer)

*"The Minister came from local level (municipality), he knows what is going on."* (Producer/policy maker at the local level)

When it comes to individual perspective, sustainability is simply interpreted as family farm business or trade company economic goal (including recognition of other stakeholders' involvement). However, having in mind very long tradition in raspberry production in the region, it also includes different perspectives of environmental sustainability.

**The Statements:**

*"Sustainability means sustainable for all stakeholders in the chain, from farmers to cold storages and exporters. For me it means that I can have profit."* (Manufacturer/Trader)

*"Small producers only look to earn salaries for their family."* (Producer)

*"Organic producers still suffer due to lack of planting material, lack of widespread organic inputs and non-adjusted regulation. If you want to make income, you have to start with good planting material and inputs."* (Producer)

Finally, there are some common misunderstandings related to meaning of sustainability. Some of the interpretations are too narrow, basically driven from the project management point of view.

**A statement:** *"When you say sustainability, I mean on project implementation - we need to implement new solutions and to make them sustainable in the future. We have to build financial independency from state or other forms of support. It is essential."* (Producer and policy maker at the local level)

Prompt to explain what it means to producers, the interviewee addressed producers involvement in project implementation during the training process - "OK, they are here to learn something, to change their practice, gain new experience."

### 7.7.3 Policy and regulatory conditions

During the interviewing, our participants expressed their opinion toward conditions they were facing with in production and trade. The main issues are identified regarding regulatory and policy, as well as market part (the second took more attention during discussion than the first one). Raspberry production is recognized as a unique opportunity for the agricultural sector development in the Region of Western Serbia and Sumadija. The Serbian National Tourism Organization use words in commercials such as "Welcome to Serbia, the capital of the RED GOLD". Is it really the capital of the red gold concerning the way of doing business?



Do you know what happens when you combine ideal climate, fertile soil, high-quality seed and the years of experience of Serbian farmers? The answer is quite simple – the tastiest and most fragrant raspberries! Welcome to Serbia, the capital of the “Red Gold”. (<http://www.serbia.com/>)

#### 7.7.3.1 State land tenure

Although Serbian Government adopted the Regulation on the Conditions, Manner and Procedure for Exercising the Priority Rights to Lease in December 2017), including related criteria for determining the lease fees, it is totally unfamiliar to agricultural producers. As a matter of fact, legal entities that are registered and have an active status in the Registry of Agricultural Holdings, and submit a plan for investing in agriculture and food processing industry with a view of launching a new business activity, expanding the existing one and diversifying the existing production programme with new products will be given priority in

leasing state-owned land to the period of 30 years. The general criteria for assessing the quality of investment plans are the following:

- the investment money will have to be spent on acquiring new fixed assets, and this is not limited only to crop growing;
- the investment should be at least 3,000 EUR per hectare of land, out of which at least 500 EUR per hectare should be invested in processing capacities;
- the total investment, over the three year period starting with the day when the investment has been made, should be at least 500,000 EUR;
- in the first year, at least 30% of the amount should be invested with the exception of the investments in those municipalities that dispose of less than 1,000 hectares of agricultural land, and in which the total investment amount could be less than 500,000 EUR.

The Law on Agricultural Land also states that only up to 30% of the state-owned agricultural land in a particular municipality can be leased in this way. Family farm isn't usually registered as a legal entity. Therefore, family farm is not eligible for such arrangements. Instead, they are still kept in a short leasing position, which is not favourable in general.

**The statements:**

*"There are 800 hectares of state agricultural land in Arilje. It is leased for one year, but what can be done during the one year when the raspberry production is concerned. There are people who would land if a long-term lease exists (if the land would be landed for 20-30 years)." (Producer)*

*"I am a member of the Land Commission at the local level and I am very dissatisfied with the meetings. Each year, the same story, there is no progress. We prayed that someone excluded our area because of its specificity. This is a land that cannot be given for just one year." (Producer and policy maker at the local level)*

#### **7.7.3.2 Environmental sustainability and regulations**

There was a huge discourse related to planting materials (nursery stock/canes), environmental sustainability and trading. The problem is essentially connected with necessity to shift sales from frozen to fresh raspberries. Based on different experts opinion import and planting of new varieties, particularly those varieties most appropriate for the fresh markets in Europe and North America, is a key element of the strategy for the sector.

**The introduction – The experts' suggestions and practice**

"2008 - Companies on the Trade Mission imported nearly 100,000 raspberry seedlings, and these seedlings were used to plant 10 hectares of new fields of berries for the fresh market. Half of these new plantings are the "Polka" cultivar, which is considered to be the best raspberry variety for the fresh fruit market, and which was imported into Serbia for the first time." (USAID Agribusiness Project)

"Most raspberry plantings in our country were unfortunately set up by nursery stock (canes) from existing plantings. This is one of the most important reasons for low yields, bad quality of fruit and short duration of

many plantings. Although it is forbidden pursuant to the Law on Seeds and Planting Material, this practice still continues.”

(Source: *The state and prospects of raspberry production in Serbia*. Available from: [https://www.researchgate.net/publication/284707670\\_The\\_state\\_and\\_prospects\\_of\\_raspberry\\_production\\_in\\_Serbia](https://www.researchgate.net/publication/284707670_The_state_and_prospects_of_raspberry_production_in_Serbia)) [accessed Aug 10 2017].

Plant material is infected with a fungus *Phytophthora fragariae* var. *rubi*. According to our respondents, the disputed planting material is imported into Serbia through the action of renewing stem plantations supported by the Ministry of Agriculture, Forestry and Water management of Republic of Serbia. This action was suggested by the experts, scientists in the field of research (see box above as the illustration). Unfortunately, the poor standards in import procedures were implemented, and resulted in huge problems that raspberry producers have faced within the practice.

With increased soil moisture or high groundwater levels, along with the presence of infected plants, we can expect a more massive occurrence of fungus disease. It is important to know that this fungus is permanently found in the soil, but for its activation is necessary to create the appropriate conditions such as a large amount of water in the soil, i.e. fields where water is poorly migrated (pseudogley and similar poorly permeable soils). Most of the areas where raspberry plantations are grown are in the hilly surface with good natural environment including the quality of soil. It is particularly important for region of Arilje. It can be concluded that we still miss common scientific approach to advisory service that should help agricultural producers to overcome different barriers.

#### **The statements:**

##### **About the problem:**

*“We are struggling a lot. We do not have adequate seedlings. And that's first and foremost. We could make a yield of 10kg per 100m<sup>2</sup> or 20t per hectare. But we cannot do this when we got infected planting material.”* (Producer)

*“We tried to raise public awareness. In 1998, infected planting material from France, native plant, was introduced. Over a million infected seedlings were spread throughout Serbia. Also, samples of plant material from Valjevo and Arilje region were taken, sent to Scotland in a laboratory where the presence of fungus on planting materials was confirmed. Nothing has been done in this matter for 14 years... Raspberry growers still buy it all over Serbia, receive state support in the form of subsidies for so-called high-quality planting materials, but it is also infected.”* (Producer/policy maker at the local level)

*“And the chemical inputs are problem. Lot of people in Serbia live from income earned on raspberries. Something is happening (or we can blame climate change in general). But something's happening. There were no diseases we have now.”* (Manufacturer/Trader)

##### **What are the consequences?**

*“We are destroying our production. Serbia had 100,000t raspberry production at 11,000 ha in 2002. Now, with 20,000ha, we have 70,000t. We have a smaller yield, on a larger surface, the raspberries are simply dried.”*(Producer/Trader)

**What might be other reasons? Climate changes – high humidity or drought:**

*"The fungus works in high humidity conditions. Last year many roots dried up. A problem has appeared recently. When it is a dry season, the raspberry plantations can survive."* (Producer)

**What can we do?**

*"The raspberry production is a science. Somebody should take care about the scientific research, we (agricultural producers) should work based on the experts suggestions and advices."* (Producer)

If we analyse sustainability in the context of chemicals use at the farm level, our producers advocate for strict control of chemical strategy implementation in production and stress a huge, uncontrolled activity of so-called agro-input lobby. They are faced with various chemicals providers. Producers have the ultimate goals - to preserve productivity growth, lower costs and higher income. They are also aware of the chemical approach limitations and traditionally oriented toward strict low use of inputs.

**The statements:**

*"We have an important problem with commercial, agro technical lobbies. Their goal is to sell as many inputs as possible (pesticides, herbicides, fertilizers). They come with their experts and lobby for a certain input. They advocate for 12, even 16 times treatments per year. I spray only 4 times."* (Producer)

*"We will probably face with problem at the European market. The impact of agro technical lobby must be suppressed. The scientific and professional services providers (experts, advisers) can go on the ground and give advice, not traders."* (Producer/policy maker at the local level)

*"Unfortunately, all traders, processors and cold storages have included agricultural pharmacies in the business, so they will agitate for the chemicals any way."* (Producer)

*"In the case of chemicals, it is incomprehensible: if you need to get the medicals you need a prescription from a doctor, and in order to buy any agricultural input (poison), you can do it without any instructions and as much as you want."* (Trader)

*"This year, the person is acting on the behalf of one firm, and what offers is the best. The following year, he represents another company and instantly changes the story - something else is best - you should forget the last year story."* (Manufacturer/Trader)

*"More spraying - more problems with various diseases."* (Producer / policy maker at the local level).

Our interviewees also put attention on importance of the existence of laboratories for testing the presence of heavy metals and pesticides in fruits. Purchase of all necessary equipment was covered by international funds/projects, but these laboratories are still not in the use. They also suffer from existence of non-efficient and old fashion state advisory service.

### 7.7.3.3 Agricultural policy

The policy measures governed at the national (and local) level have significant impact on farm income in the fruit sector in Serbia in general. It is expected that the participants positively evaluate the efforts of the decision-makers to help raspberry producers to develop their own businesses. The participants mainly commented on the investment support and the changes related to establishment of transparent procedures for funds allocation from the agricultural budget. Although simplified, these procedures are more adjusted to younger farmers (older farmers are still facing problems with application).

#### **The Statements:**

*"I am delighted that this year producers will be able to make a 50% return on the purchased machinery, which is very positive. If you introduce an irrigation system, you will get receipt immediately."* (Manufacturer/Trader)

*"It's important that everything goes for purpose. During The Green Plan implementation (farm support during 1970s in former Yugoslavia) people made a house instead of a stable, bought a car instead of an agricultural machine, now - it's impossible."* (Producer/policy maker at the local level)

*"Young people are much better at work. They know everything"* (Producer).

There is a positive trend in development of young farmers' activity in the Arilje region. During the last 5-6 years more people started with the agricultural (raspberry) business. It is evident that younger families are going back to rural areas and do farming. For very long time, farmers in their 50s dominated in the structure of agricultural population. Younger farmers are more oriented toward farm expansion, they buy land and plant new plantations. The price of land varies from 100 to 500 euro/a. They invest in their own business.

**A statement:** *"Here's my case. When my son graduated from college we established our own business - cold storage. I didn't even take any additional money from the state. He didn't "wait the state for a job" (relay on opportunity to be employed by other private or state entity), he started his own business (created self-employment)."* (Manufacturer/Trader)

Participants at the local level announce that the Working Group will have the task to access the effects of applied agricultural measures in order to maximize benefits for producers and all stakeholders in the raspberry food chain. Such an initiative would force establishment of budgetary spending mechanism in the agricultural sector of Serbia based on measurement of budget spending effects in the sector development (there is no systematic control of effects in budgetary spending in agriculture - do we force development of modern agriculture, productive farming, younger farmers, what is happening at the sectors level...).

Particular attention was paid to the insurance scheme. High exposure to unforeseen weather conditions caused the widespread need for insurance in the sector. However, insurance premiums are usually paid by larger producers individually, while small producers make agricultural insurance through trade companies (cold storages). According to our respondents, the insurance companies act inconsistently. The government

supports agricultural insurance with subsidised premiums, while the municipality takes care about systematic protection from hails.

**The statements:**

**The way how insurance works**

*"Insurance Company provided the most of insurance in 2015 ... the greatest damage was paid, but in the following years they gave not so favourable conditions. And they should have given more premium to attract more farmers."* (Producer)

*"Each cold storage has at least 100 producers in their portfolio. For insurance companies it easier to arrange specific agreements with cold storages, giving 10% of premium to convince producers to buy insurance."* (Manufacturer/Trader)

**The parallel activities (role of the municipality)**

*"Our municipality recognized problem of hails, we got 100 missiles, and we launched all the stations and stimulated our shooters because they were very poorly paid by the state - only 4.000 RSD. We stimulate them with the additional 8.000 RSD per month. And that gave the effect. Only negligible damage was recorded in Arilje, while everything was destroyed in Kosjeric and Bajina Basta, Pozega and Guca (the neighbouring municipalities)."* (Producer/policy maker at the local level)

The way how innovations are disseminated is quite unusual. Farmers lost the trust in agricultural advisers who act as "input traders". They even started to experiment on a small size of their land property. They buy new varieties of raspberries (for example polka and polana), and rise new experimental plantations under green houses, apply different technologies, evident differences in the yields and quality of products. They do it completely independently from scientific research institutions. The clear links between technological research and the needs of the sector are missing. In the interview they noted that the last PhD dissertation defended at some of the faculties of agriculture in the country related to technology of raspberry production dates back before 2000.

## **7.7.4 Market conditions**

### **7.7.4.1 Price**

Farmers are very concerned about the raspberry price at the domestic market. The price is unpredictable, and a special problem arises when the harvest comes. Due to the lack of stable institutional arrangements in the food chain, agricultural producers are faced with numerous problems - they simply depend on price determinate by cold storages (traders). The interviewed producer gave following evidence: *"The biggest problem, year after year, is an enormous oscillation of price. The differences go up to 100% (for example, from 100 RSD to 200 RSD per kg of raspberries)."* (Producer)

Better price can be obtained for organic raspberry (3.95 euro/kg compared to 1.66 euro/kg for conventional production). Producers in the region (in Bosnia and Herzegovina and Kosovo) are starting with raspberry business. This is what our producer from the first focus group said about this issue: "Our



neighbours from Bosnia and Herzegovina worked during season at our farms as seasonal workers. Now they have their own seedlings, good quality planting material, they have a good opportunity to start successful business. Their land is "cleaner". I visited several farms. Through the process of cross-border cooperation, we are in a position to learn now from them which one couldn't imagine earlier." The yields are still far away from yields in Serbia, and quality of raspberry produced is at lower level. This situation didn't prevent Serbian traders from importing certain quantities from the region. The Serbian market is currently in the stage of hyper production. This year all storage capacities are fully loaded - what will happen if they face with barriers in selling current stock at the foreign markets?

**The reminder- Story from BLIC daily magazine, 02/16/2017**

**Title: In the last few months, Serbia has been recording a constant decline in export of raspberry compared to previous years, while cold storage units in Western Serbia have huge quantities of frozen raspberry on stock.**

The interest shown for Serbian raspberry abroad has been at its lowest in the last ten years – the exporters claim. They also say that the purchase price of frozen raspberry is lower than the one of the fresh which was in the region of around 230 RSD per kg.

Last year, this fruit was sold for upwards of 320 RSD per kg. The exporters say that the reason for that is the fact that Poland had a record-breaking year in 2016 when it comes to raspberry yield. Also, the drop in export sales is due to the fact that Serbian exporters mixed the raspberry of lower quality with the top quality sorts like Vilamet and Miker which make over 90% of the overall raspberry production in Serbia. Buyers abroad were unhappy with this decision and some of them even returned entire contingents back.

The agricultural experts claim that the bad situation with the export of this fruit will be resolved soon, adding that the exporters should not mix the two qualities together and be purely driven by profit. In 2015, Serbia was at the very top in the world when it comes to raspberry export with 105,000 tons. In 2014, the country generated 248 million EUR from exporting this fruit.

The advantage that our country has is that the two prevalent sorts in Serbia – Vilamet and Miker – are extremely tasty and that almost no country in the world can compete with that. Furthermore, Serbia is well-known all over the world for these two sorts so the winning formula should not be changed.

Source:

<http://www.blic.rs/vesti/ekonomija/kako-su-domaci-izvoznici-unistili-rod-maline-i-sada-ne-mogu-da-je-prodaju/438gb02>

Raspberry producers don't have contract price for their product. Furthermore, they are forced to buy inputs for own production using unusual forward agreements - the price of inputs is set and they make forward agreements without any information about the future price of commodity in which they are going to make final payment. It shed light on related issues: the sector structure - raspberry price - the institutional arrangements.

**The statements:**

*"We have a sort of "blind agreement" - there is no statement about raspberry price, but it has the price of all inputs we take from them. And everything is in euro. Traders they do not know what raspberry prices will be at the moment of realization. There is a lot of raspberry import from Bosnia, Kosovo, Albania and Macedonia, and all commodities is sold as "Serbian". The imported is at far lower quality. The cold storages had signed contracts with customers from abroad, but they didn't have quantities due to drought, so they*

*imported raspberries and mixed it with ours. Buyers saw that this was not an adequate cavity and they were returning the quantities. In March this year, 10000 tons of raspberries were exported, which is very unusual."* (Producer/policy maker at the local level)

*"The "polka variety" technology is much easier - it requires less investment, it is less exposed to the risk of disease, and the fertility is higher and does not require special agro technical measures - at the same time it cuts the market price."* (Producer)

*"The assortment must change - fresh raspberries can be exported."* (Manufacturer/Trader)

#### **7.7.4.2 Market structure and institutional arrangements**

Changes in raspberry prices on the world market are not as intensive as on the domestic, internal market. Consequently, it puts more attention on analysis of the market structure and the form of contracting. The great dependence on exporting companies is evident. According to our discussions, there are a few export wholesale companies in the region of Arilje (5-6 larger companies). All other cold storages (medium and small) "work for large exporters" (they are not acting as contractors or integrated companies, but they rely on export companies in their business). Farmers are at the bottom of the chain and in a very subordinate position in relation to other participants in the system.

##### **The statements:**

##### **How is the sector organized? Who plays the main role and who is in subordinate position?**

*"As a small exporter I always export over the huge export company. Even those who have up to 1000 tonnes in their capacity export through large traders. They are all part of the system and they work for big exporters in essence."* (Manufacturer/Trader)

*"Whatever happens in the market, only small producers or small cold storages suffer."* (Producer)

In order to improve the position, farmers who were able to build their own storage capacities did it to control the price during the harvest. Nevertheless, the cost of storage is extremely high (having in mind electricity and other payments), and it is uncertain when and under what conditions they will be able to sell frozen raspberries to the large warehouses. Currently, around 250 small cold storages operates in the Arilje municipality only.



Picture - Storage capacity / family farm in Kosjeric

Having in mind the market structure, strict compliance with the Competition protection law is necessary. At the same time, it is obvious that there are no instruments for which production will be negotiated in advance, for the known buyer and the pre-defined price. The current situation is unfavourable regarding position of farmers and it is certainly unsustainable in the long run.

**The statements:**

*"The state should take care about prevention from monopoly on the market, it must create an adequate environment. Let me say - the cake must be fairly divided."* (Manufacturer/Trader)

*"Raspberry producer signs a contract with cold storage. Producer takes a lot of obligations, but trader doesn't have any obligation to producer. This contract is not fair, this contract is a fraud. The contract obliges you to give a certain amount of raspberries (kg/a in 1st class), in turn you can take chemicals, fertilizers, bind to the existence of certain hygienic measures, the workers can be educated how to harvest raspberries, but there is no evidence of the final price."* (Producer)

*"You should know the price below which you cannot go. Also, if the price is 2 euro / kg, 60% should belong to the producer, and 40% to the dealer / processor."* (Producer/policy maker at the local level)

#### **7.7.4.3 Financing**

Farmers in Serbia are very cautious. If they borrow, they belong to the best clients in terms of loan repayment. Family farmers usually use their own resources combined with subsidies to develop or technologically improve their production.

The first formal model of a short-and long-term lending program for agriculture was established in 2004 by the Ministry of Agriculture. The system allowed more favourable conditions than credits available from banks. The loans can be given to eligible producers - they have to be registered in the Register of Agricultural Holdings governed by the Ministry of Finance. The loans were exclusively provided to the natural persons. The interest rate of short-term loans was 5% with a repayment period of 12 months. Long-term loans were disbursed by commercial banks. Loans were given for specific purposes: building and purchasing of irrigation systems and equipment, purchasing of agricultural machinery, establishing plantations, establishing greenhouses, as well as investing in livestock production. Under this system, banks contributed 10-30% of the capital, and the Ministry of Agriculture provided 70-90% of the capital (USAID BEP, 2013). In 2010 a new model of credit support by the Ministry of Agriculture was introduced - interest-rate subsidies are provided in order to encourage banks to lend to the sector. The Ministry of Agriculture facilitates very low interest rates to individuals, agricultural households and SMEs via a number of partner commercial banks. This model has been implemented since 2010.

**A statement:** *"It's not all about subsidies. We need a healthy system that young agricultural producers can get affordable loans that these young people, who have remained on the property of their forefathers, remain on them to work and prosper, not to go to urban areas. Maybe someone from the city, seeing how beautiful life in the village is, may wish to return to new, modern village in the future. (Expert)*

Smaller producers, as a rule, have limited access to these resources. Very often they are in less unfavourable position because they purchase all inputs through the "blind agreements", which have already been discussed. It recalls to some earlier systems of exchange with parities that were defined against the primary producers.

### **7.7.5 Strategies mentioned by interviewees**

What can be derived from our interviews - how our stakeholders see their position and strategies? The main focus is on overall importance of the sector for the Serbian agriculture and economy. However, they are aware of the fact that the food chain, even overwhelmed with numerous problems, gives as much as possible support to the local community development. During the transition, many factories were closed down, unemployment increased and overall economic situation was very bad. The only opportunity to ensure fair living standards for a family was to use local knowledge and tradition, evidently present in the cultivation of raspberry. The system still doesn't work properly, it is faced with numerous barriers, but there are also opportunities and solutions for better response to the contemporary challenges. Our respondents pointed out the following options:

1. The new production alternatives such as
  - technology improvements and new varieties,
  - labelling using quality food schemes,
  - development of fruit processing.
2. Cooperation between the food chain stakeholders
  - less formal forms (trainings, education, coordination etc.),
  - formal cooperation within cooperatives/producers groups,
  - cooperation between small cold storages.

#### **The main focus**

*"Listen, all Serbia is under raspberry production. I have worked for projects, agricultural producers in the south of Serbia and Vojvodina started to do "our" business." (Producer/policy maker at the local level)*

*"Based on their export importance, raspberries are the forth product in Serbia. But we did absolutely nothing to double or multiply our income. It is sold as bulk commodity. We didn't make our brand or commodity mark..." (Producer)*

#### **7.7.5.1 Production alternatives**

##### **Technology improvements**

The conducted research shows the need to change to the new types of raspberries that are sold as fresh produce. The current varieties (Vilamet and Miker) are sold in the form of frozen product. Price of the

frozen products is less than for the good quality fresh produce. Simultaneously, it requires a new form of food chain organization starting from the producers, through development of systems for packaging specifically designed to cover all requirements in fresh produce transport and storage, to completely new marketing logistics (transport and retail).

### Quality schemes

Recognition of the originality of products has become increasingly important in recent years. It is important in terms of diversity, recognition of traditions, as well as in terms of prevention of counterfeiting (misleading). Protecting autochthonous products for each country means, at the same time, the contribution to the protection of a particular area and encouraging rural people to produce high quality products in accordance with international food safety standards. The quality of food products is also a strategic requirement in the context of international integration. As far as raspberry is concerned, our interviewees put attention on labels such as Made in Serbia, PDO and Organic.

The label Made in Serbia is important due to the fact that other producers from the region already started to produce raspberry (it wasn't their alternative in the past) and there is a need to capitalize on tradition and to mark strategic product that is recognized at the international level. On the other hand, producers should also think about the regional capacity to cover world demand for this specific product. It is also evident that the frozen raspberries are sold in packages that are defined by the end customer without any sign of geographical origin.

In Serbia up to now 24 agricultural food products have been protected by a geographical indication, of which 12 are promoted through printed and web material: eight are registered names of origin and Ariljska malina belongs to this group. In raspberry production, Serbia has a PDO standard - a product name identified as a geographical indication, closely linked to a specific production area. Additionally, the importance of organic raspberry production is constantly growing. This alternative is supported by different public programmes and growing market demand. Our interviewees emphasized that foreign companies ask for share of organic products in total quantity set by agreement. Even more, they ask for supply of mix of berry fruits (large buyers are looking for raspberries, blackberry, cherry, and blueberries).

**A statement:** *"We have good conditions for the production of organic raspberries. Every year there is a congestion of raspberry exports, as it happens that cold storages have a surplus of goods, and therefore the price goes down. Producers suffer from all the burdens, and we want to avoid this." (Producer)*

### Fruit processing

The other alternative in adding value is connected with fruit processing. The current situation can be described as follow: (1) small amount of raspberries is consumed directly and traded as fresh commodities both at domestic and foreign markets; (2) although it can be processed into a multitude of food products - preserved fruits (jams, marmalades and dried) or juices, raspberries are generally sold as frozen fruit (bulk market). We asked our interviewees to explain were there any other solutions regarding this issue? The positive response appeared only during the second discussion (with stakeholders who deals with storage and trading).

### The statements

*"We thought about building of processing capacity in Arilje devoted to the first stage of processing - classification of products by quality and retail packaging. Everyone could work for their own cold storages". (Manufacture/Trader)*

*"The interesting investors could be our people who live abroad. They can invest in a factory that would deal with the processing of raspberries - the production of jams, juices, etc. This factory would deal with other fruit processing as well. A man from Austria thinks about it, and he says that he is currently working on marketing plan - analysis market preferences and possible partners for selling such produce." (Manufacturer/Trader)*

### 7.7.5.2 Cooperation

The interviewees and stakeholders agreed on importance of strengthening of cooperation in the food chain. Cooperation can be implemented as the less formal (different forms of trainings, education, coordination etc.). Previous trainings and educations have been realized within various project activities supported at the local, national or international level. The producers were placed as the passive users of "knowledge transfer" in these programmes. There is a need to foster cooperation between different stakeholders that can educate producers to improve their practices in different areas - technology, marketing, standards implementation etc. The local action groups can act on the behalf of local stakeholders. Unfortunately, LAGs don't support these activities in a full capacity yet.

Formal cooperation can be organized throughout cooperatives or producers groups. Our participants spoke a lot about cooperatives. Serbia has got a long tradition in cooperative movement development (starting from 1846). The cooperative Radobudja exported fruit produce from the Arilje region to Egypt after the 2nd world war. Today, this cooperative is just an old building and storage capacity in the village with a few younger inhabitants. However, our respondents ask for better understanding of cooperatives role in the sector development. They made a lot of reflections regarding this issue.

The statements: <b>Reflections about cooperatives</b>	
Positive attitudes	Negative attitudes
<i>"We thought that it was a characteristic of the Communist times. That's not true. Throughout the world, cooperatives function properly, and this sector has faced many obstacles in our country. Well, we had co-operatives when the majority in the world didn't know even what it was." (Manufacturer/Trader)</i>	<i>"Nobody trusts anyone anymore. There are also honest people, but the people lost their confidence in cooperatives, in general." (Manufacturer/Trader)</i>
<i>"And fruit producers in Italy are members of cooperatives, like our families were in the past." (Producer)</i>	<i>"And we all make associations that should gather producers. And I am the president, and he is the president, we have hundreds of some presidents of associations, and who cares about the people?*. (Producer)</i>
<i>"I have to mention Dobrilo Nenadic, Jova Popovic, who worked in the Agricultural Cooperative Arilje. They are the true creators of the Arilje Raspberry. In the 1970s, they persuaded people to plant raspberries. While they did it in the right way we had a yield of over 200 kg/a." (Producer/policy maker at the local level)</i>	

It is also clear that a large number of small scaling capacities of cold storages belong to the family farms sector. They can play a vital role in the market if they increase their power. They can do this by joining a cooperative.

**A statement:** *"As cold storage with small capacity I am not interesting for anybody at the market. And 200 of us are in the same position. What can we do, to close the business? And small cold storages have built a price for producers. They are those who help and can even more contribute in building of a more rightful system of created value distribution among food chain stakeholders." (Manufacturer/Trader)*

### 7.7.6 JUST IMAGINE YOUR BUSINESS IN 2027

At the end of conversation we asked our participants to address the vision of their business in the next 10 years prospect. Surprisingly, only one vision appeared.

#### **The statements:**

*"It's only necessary to copy the calendar from the 1970s or 1980s, as it was then." (Interviewer: What do you mean?)*

*"Easy, during that time producers didn't use chemicals as they are using today, 2-3 times a year they implemented chemicals under strict control of engineers, the plant material was not infected, we had a cooperative in which the engineers were doing the experiments, they never wanted to recommend the preparation until they checked everything. We had a yield of 30 kg/a by the river, and now the river is flooding productive area; there was no "nursery" lobby. We could have decent living standard from the raspberries, we our houses and bought land, no one else in the region dealt with raspberries, and now we have raspberry producers all over the Serbia and region as well." (Producer)*

**Or**

*"If we don't change anything, we will stop dealing with raspberries." (Manufacturer/Trader)*

Farmers need to face with all problems and use the existing knowledge and experience they have. With publicly available complex analyses of the market conditions in the country, region, Europe and the worldwide (Economic Research Unite, the Ministry of Agriculture), they can improve their business. Otherwise, the only way out is the abandonment of raspberry production, which in the case of Arilje raspberry, given the tradition of dealing with this activity, will not happen.

Parallel, it is necessary to move from traditionally oriented to entrepreneurial-oriented farming integrated within a larger food supply system as a part of national, regional and international flows. This type of reform requires both macro and micro approach (using bottom-up and top-down approach). The region we have observed is specific. They have a very long tradition in raspberry production as far as Serbia is concerned. Local milieu can be combined with exogenous factors which can improve local communities and regional perspectives in different aspects of sustainability (economic, social and environmental).

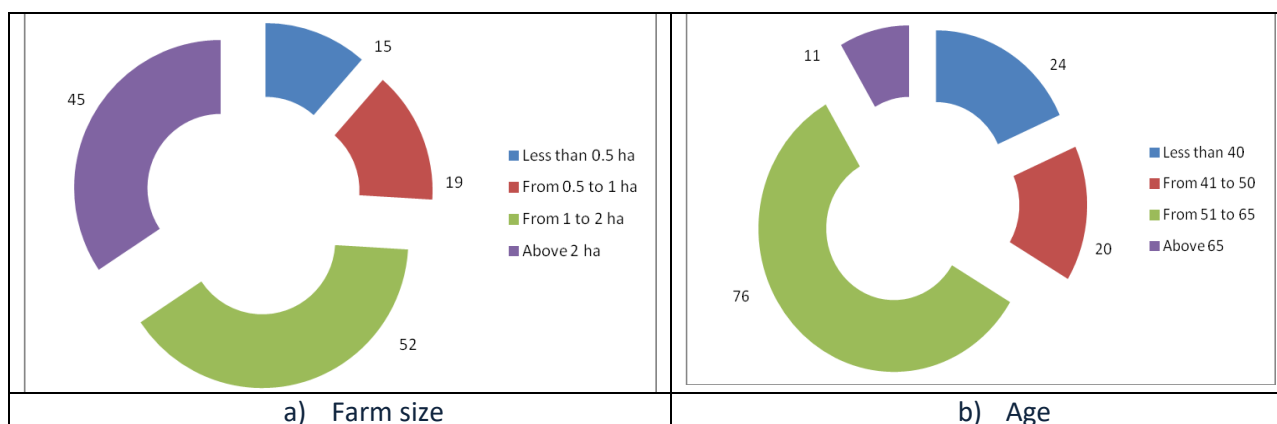
## 7.8 THE RASPBERRY SECTOR - SURVEY RESULTS

### 7.8.1 Introduction

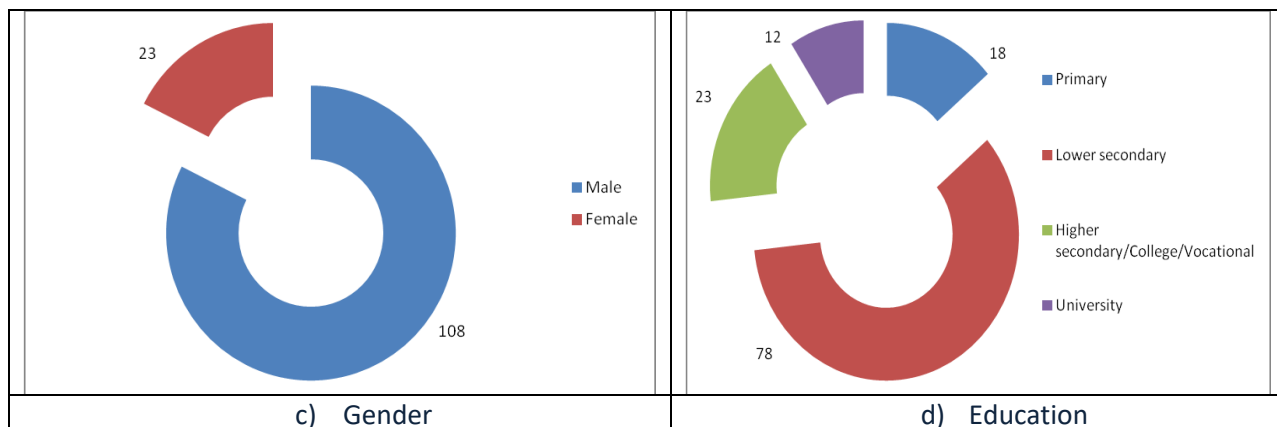
A random selection of the sample units is made based on farm size in the Arilje Municipality as the stratification criteria. The sampling frame, i.e. the list of primary producers is obtained using the Municipality data on the raspberry producers at the local level. Due to high cost of interviewing (collection of data) Arilje Municipality was selected as the representative of total area of Sumadija and Western Serbia with almost 85% of all raspberry producers officially enrolled in the agricultural holdings register in Serbia. The analysis focuses on small family farms (from 0.5 to 1 ha for raspberry and with long tradition in producing raspberry). The sample of primary producers in the region for study is representative of the target population (Annex 3).

The data collection was supported by the Municipality of Arilje. The interviews were conducted in December 2017 / January 2018. The interviews were lasting on average 35 minutes and conducted using the face-to-face method. The interviewers were trained based on the guidelines prepared by the WP leader. The questionnaire was translated in Serbian while the regular procedure of translation and back translation was used. The sample size is 150 and the final database contains 131 responses (19 interviews were rejected due to inconsistency in answering, e.g. very low understanding of questions by farmers – in these cases the lowest level of understanding is marked in the questionnaire).

The main characteristics of our farms in the sample are presented in Figure 45. Based on total area, farms above 1 ha dominate in our sample. However, observing only the farm area used for raspberry production, small family farms are more represented in the sample than others (mainly larger family farms). Young farmers represent a group of slightly more than one third of our sample. Traditional gender structure is manifested by the larger share of male farmers, while the share of lower secondary education level among farmers is almost 60%.



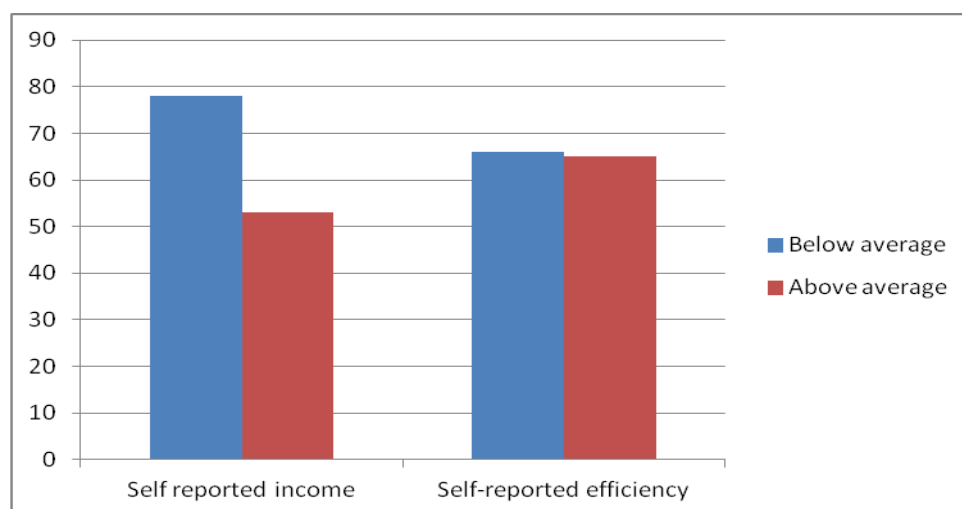




**Figure 45. The number of interviewed farms by a) farm size, b) age, c) gender and d) education.**

Source: SUFISA farms survey (RS – raspberry)

Self-reported income is calculated using data on average price and quantity sold per farm during the observed period (Figure 46). The average income per farm is EUR 11,180. The information about the cost of raspberry production is collected as well, and the average share of cost in total income collected in raspberry production is 64.85%.



**Figure 46. Self-reported income and efficiency of surveyed farms**

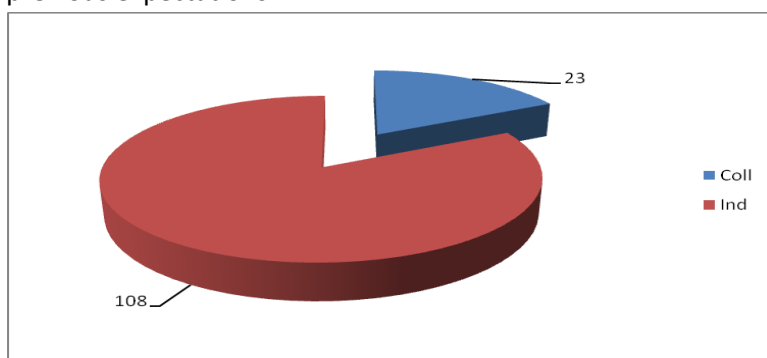
Source: SUFISA farms survey (RS – raspberry)

The objectives of the survey are to map existing institutional arrangements across the raspberry sector in the Region of Sumadija and Western Serbia and to identify the main attributes characterizing institutional arrangements in the sector. Additionally, the survey aims to explore the sustainability through producers' opinions regarding quality of institutional arrangements and its role in achieving sustainable farm businesses (in economic, social and environmental context) including collection of information on the adoption of good environmental practices and sustainability standards. Finally, the survey addresses the factors driving primary producers' decisions about farming strategies in the future in response to potential emerging issues (adverse climatic conditions and pests, market changes and price volatility, policy and regulatory reforms).

The objectives are reflected in the structure of the questionnaire. Section A (QA.1 - QA.5) informs about surveyed farm business characteristics. The purpose of this section is to collect data on the farm's structure which will be subsequently used to explore the extent to which some institutional arrangements are more likely to be adopted by certain farmer groups. Section B (QB.1 – QB.34) asks questions about the raspberry case study - amount of production sold in the last completed financial year 2016/17, sales channels - collective (cooperatives, POs and unions) or individual (wholesalers, retailers, exporters, local shop and markets, restaurants or processors). Different characteristics of dominant institutional arrangements (the main sale channels) are further observed by asking questions in the section C. This part of the questionnaire is mainly consisted of yes-no questions (characteristics related to formal or informal sale contracts, duration of contract arrangements, involvement of different criteria for price definition, payments and standards involved), average price for the raspberries obtained during the last completed financial year 2016-17, self-perceived level of farm efficiency and farmers perception of overall quality of sale arrangements, particularly in the context of achieving sustainable farm practices (section C1). Finally, section D (QD.1 – QD.24) covers future strategies related to main challenges farmers are faced with. This section also addresses farmers' attitudes towards importance of the main factors that will influence the sector sustainability in the future. The key farmer socio-demographic characteristics are collected in the section E (QE.1 – QE.5), while section F (QF.1 – QF.10) is designed as the administrator sheet completed by the interviewer, including interviewers mark on overall quality of farmers understanding of the questionnaire.

### **7.8.2 Sales channels: reporting the results of section B of the questionnaire**

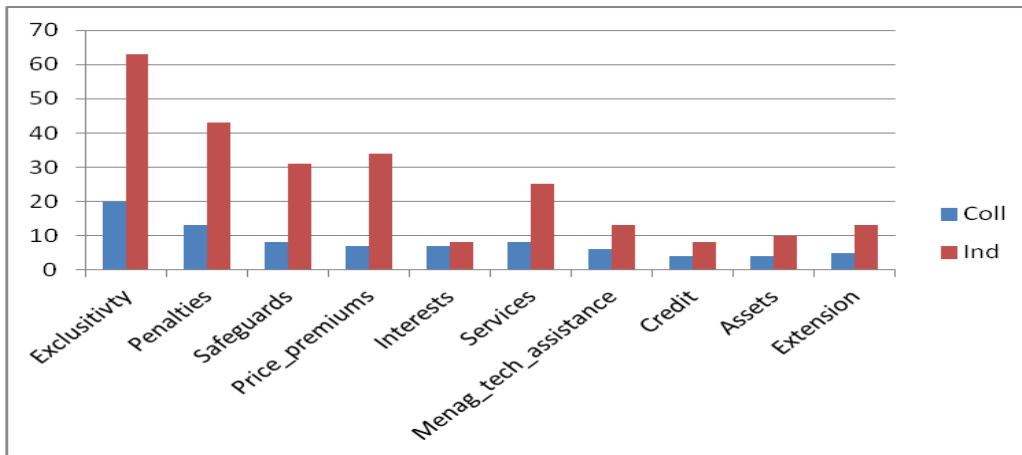
Figure 47 depicts the sales frequency (in our sample) related to the collective (Coll), and individual (Ind) sales channels in the raspberry sector (n=23 for collective vs. n=108 for individual). The majority of „individual“ sales channels could be expected because Serbian agricultural production owns a long history of cooperatives with, unfortunately, bitter end, connected to the terminus of the socialist era. Individual sales channels are a logical reaction to the establishment of the market economy, after the socialist era, and devastation of the previous system. As for the raspberries point of view, the lack of „collective“ sales channels is previously indicated as one of the leading obstacles and, at the same time, the opportunity for development of this particular agricultural sector. Markets „invisible hand“ cannot be expected to solve the critical sales issues in this case. Even without insights into the survey data, this kind of frequency range could be expected, which is reported in the qualitative research. So, this result is in line with some of our previous expectations.



**Figure 47. Collective and individual sale channels in the raspberry sector**

Source: SUFISA farms survey (RS – raspberry)

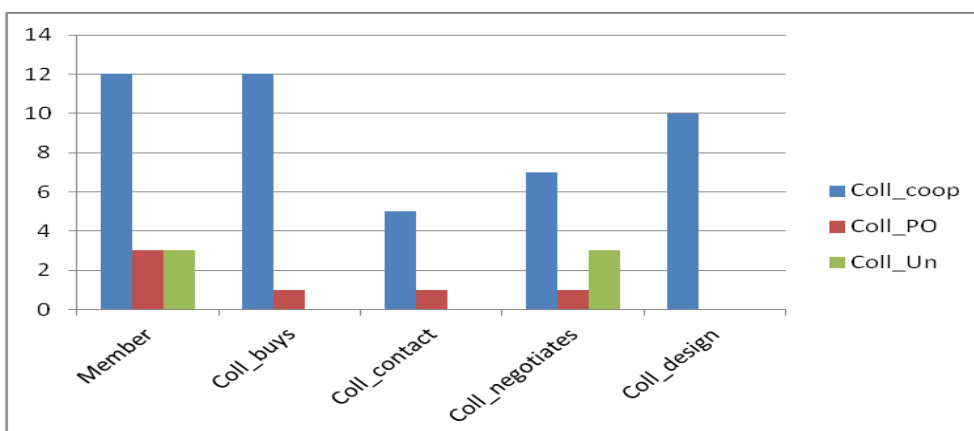
Besides general Coll-Ind frequencies, Figure 48 shows detailed primary characteristics of collective and individual sale arrangements. Relative to the frequencies presented in the previous figure (Figure 47) it seems that most elements in our sample of the collective sales pose those characteristics, while the opposite is of the dominant, individual part of the sample. It is especially the case with the “exclusivity” of sales and paid “penalties”. The moral of the sample analysis can be interpreted as follows: “more collective arrangements when it comes to sales are associated with more detailed and structured contracts in favour of primary producers”.



**Figure 48 The characteristics of collective and individual sale arrangements**

Source: SUFISA farms survey (RS – raspberry)

Finally, Figure 49 further deepens the analysis of collective sales channels by answering the question what collective organisations do on behalf of their members. There are three categories of interview subjects that use some aspects of the collective sales channels – members of cooperatives (Coll\_coop), members of producer’s organisation (Coll\_PO), and members of farmers’ union/association (Coll\_Un). The major part of the total of these three categories belongs to the cooperatives. This organisation mainly serves as the buyers of their member's production and helps them to define and design their buying contracts. In some cases, cooperatives negotiate the price terms on behalf of their members with the final buyer, but rarely provide members with contacts with essential contacts. On the other side, there is the producers’ organisation, which rarely helps their participants in buying, contacting and negotiating activities. Finally, farmers’ unions/associations are utterly passive regarding the listed characteristics.



**Figure 49. Collective sale characteristics –What do collective organisations do on behalf of their members?**

Source: SUFISA farms survey (RS – raspberry)

### 7.8.3 Characteristics of sales agreements: results of section C

Based on the data of total area of the farm, both rented and owned, and also area for raspberry, as expected, we see that higher average income is generated on farms of larger size. However, it is interesting to notice that the average raspberry price is higher on smaller farms. In addition, individual sales channels dominate the collective ones in number of farms (n=108 vs. n=23).

**Table 28:** The interviewed farms characteristics based on farms size (total area)

Raspberry_Total_Area	< 0.5 ha	From 0.5 to 1 ha	From 1 to 2 ha	> 2 ha
Total_area_av	0.30	0.66	1.50	4.65
Comm_area_av	0.29	0.56	0.92	1.54
Comm_income_av	3657	7348	10661	15931
Comm_price_av	1.325	1.319	1.294	1.265
Cost_share_(%)	67.94	53.58	67.94	69.55
Comm_sold_(%)	100	99.47	100	99.77273
Coll_channel	1	2	12	9
Ind_channel	14	17	40	35
Total_no	15	19	52	44
Age_av	51.00	45.58	53.04	50.50

Source: SUFISA farms survey (RS – raspberry)

**Table 29:** The interviewed farms characteristics based on farms size (raspberry area)

Raspberry_comm_area	< 0.5 ha	From 0.5 to 1 ha	From 1 to 2 ha	> 2 ha
Total_area_av	0.84	1.67	2.87	7.78
Comm_area_av	0.36	0.67	1.35	2.81
Comm_income_av	4279	8685	14218	29683
Comm_price_av	1.309	1.298	1.284	1.271
Cost_share_(%)	53.39	63.51	72.45	63.75
Comm_sold_(%)	99.77	99.77	99.80	100.00
Coll_channel	1	11	6	5
Ind_channel	27	33	45	3
Total_no	28	44	51	8
Age_av	50.07	50.16	52.27	45.13

Source: SUFISA farms survey (RS – raspberry)

Concerning the age of farm owners/managers (see Table 31), the highest number of farms (n=58) is in the age range of 51-65 years with an average age of 56.55 years, while, the group of younger farmers (<40 years) with an average age of 35 years consists of 24 farms. Although the total number of farms is smaller in the lower age ranges, the average income generated and average raspberry price is higher in that subsample. It is interesting to notice that individual arrangements dominate in all age groups. The highest average size is registered in the group of farmers between 40 and 50 years, while the highest price is achieved by younger farmers (below 40 years). This group implements high technology in their practices, resulting in the lowest share of cost in self-reported average price of product (56.46%). From the local community point of view, raspberry production is considered as the additional business (or second business), while at least one family member is employed out of the farm.

**Table 30:** The interviewed farms characteristics based on age structure

Raspberry_age	Less than 40 years	From 40 to 50 years	From 50 to 65 years	Above 65
Total_area_av	2.19	2.59	2.30	2.07
Comm_area_av	1.01	1.02	1.01	0.86
Comm_income_av	12883	10303	11104	10804
Comm_price_av	1.322	1.285	1.288	1.284
Cost_share_(%)	56.46	64.41	68.65	64.00
Comm_sold_(%)	100.00	99.73	100.00	99.00
Coll_channel	4	6	9	4
Ind_channel	20	31	49	7
Total_no	24	37	58	11
Age_av	35.00	46.16	56.55	69.70

Source: SUFISA farms survey (RS – raspberry)

Dispersion of farms based on education criteria (see Table 32), indicates that the highest number of farms is managed by farmers with lower secondary education (n=78), followed by higher secondary education (n=66). The number of farmers with university degree is at the moment relatively low (n=12). However, price reached in sales agreements is higher on farms managed by higher educated farmers.

**Table 31:** The Interviewed farms characteristics based on education

Raspberry_edu	1	2	3	4
Total_area_av	2.29	2.53	1.78	2.14
Comm_area_av	0.96	1.12	0.79	0.72
Comm_income_av	9607	12721	9472	6793
Comm_price_av	1.286	1.287	1.313	1.303
Cost_share_(%)	70.00	67.69	58.61	51.08
Comm_sold_(%)	100.00	99.74	100.00	100.00
Coll_channel	6	12	3	2
Ind_channel	12	66	20	10
Total_no	18	78	23	12
Age_av	63.00	50.73	44.91	42.67

Source: SUFISA farms survey (RS – raspberry)

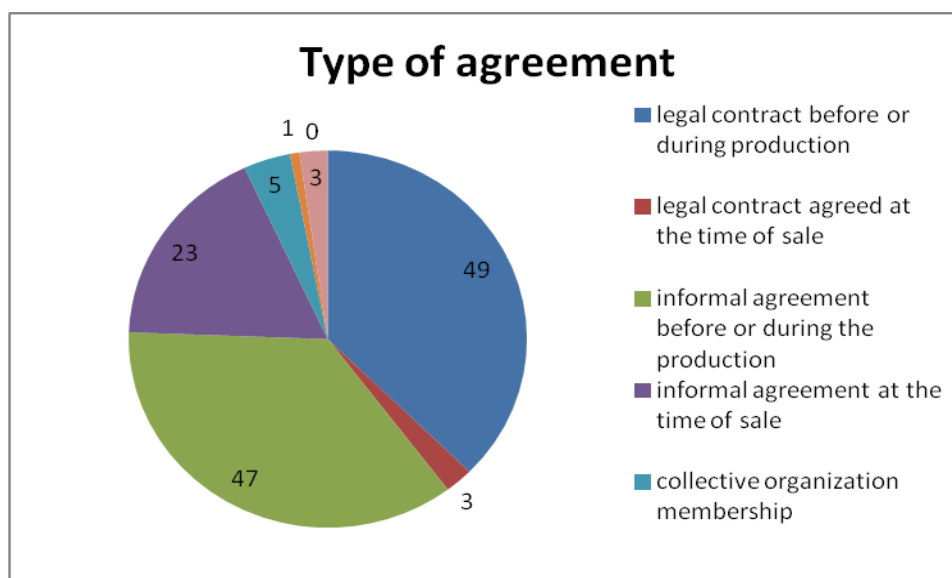
The farms in collective sales channels generate higher income and reach higher raspberry price. Collective arrangements are mainly used by larger, commercial raspberry farms (2.84 ha with 1.24 ha used for raspberry on average). For both individual and collective arrangements almost 100% of production was sold during the observed period (2016-17). However, it doesn't mean that market institutions are highly efficient, but it refers to the fact that raspberry producers are highly dependent on the counterpart (buyers of their products) as they don't have storage capacities which are of extreme importance particularly in the case of perishable goods. Collective sales channels are more often used by slightly older farmers than those who operate in the frame of individual arrangements with buyers (traders, processors, exporters etc.).

**Table 32:** The interviewed farms characteristics based on sale channels

Raspberry_sale_channel	Coll	Ind
Total_area_av	2.84	2.22
Comm_area_av	1.24	0.95
Comm_income_av	15388	10235
Comm_price_av	1.315	1.288
Cost_share_(%)	64.91	64.84
Comm_sold_(%)	100.00	99.81
Total_no	23	108
Age_av	53.04	50.12

Source: SUFISA farms survey (RS – raspberry)

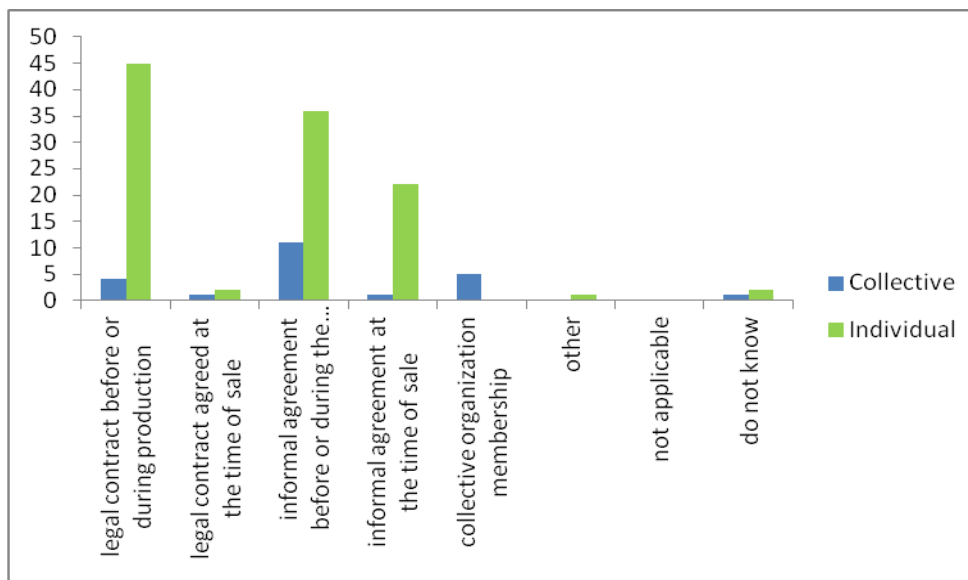
Concerning the type of sale agreement (Figure 50), a legal contract before or during production is present in 49 cases, followed by legal contract at the time of sale (n=3), and significant number of informal contracts, 47 before or during the production and 23 at the time of sale.



**Figure 50. Type of agreement**

Source: SUFISA farms survey (RS – raspberry)

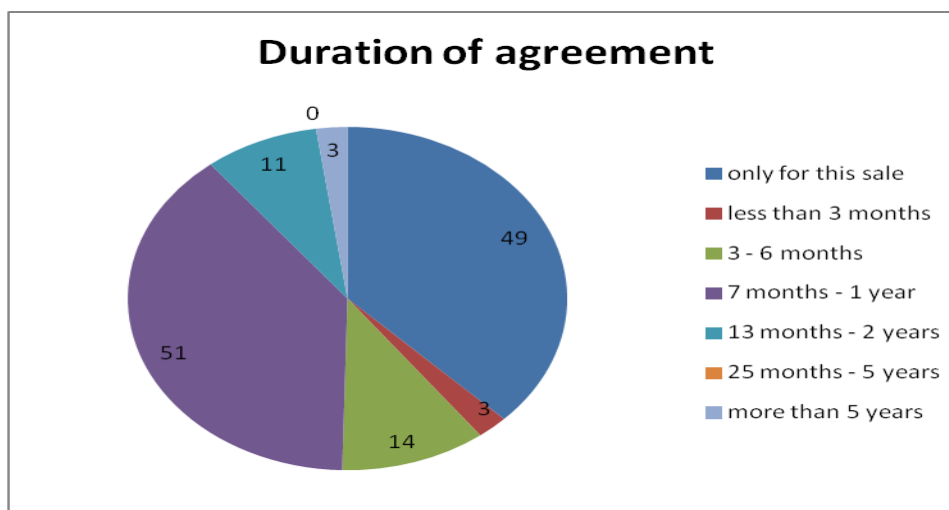
Informal sales contracts are the dominant type of contracts in both individual and collective sales channel.



**Figure 51. Type of agreement – collective vs. individual**

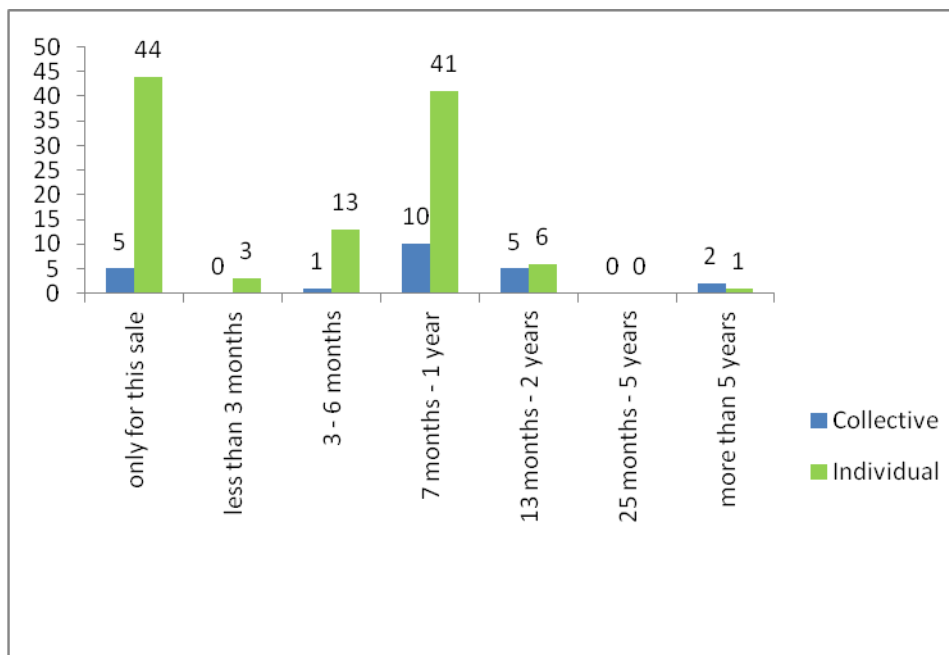
Source: SUFISA farms survey (RS – raspberry)

Most sales agreements are made either for particular sale (n=49), or they last between 7 months and 1 year (n=51). There is small number of very short, up to 3 months (n=3), or very long contracts, above 5 years (n=3). Those duration characteristics are applicable to both individual and collective sales channels (Figure 52).



**Figure 52. Duration of agreement**

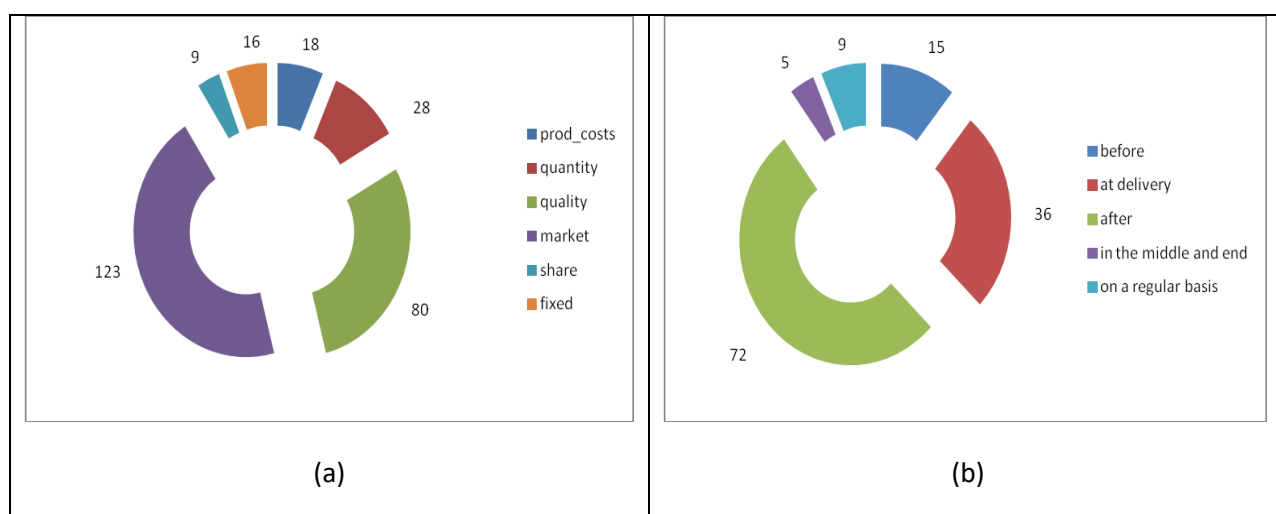
Source: SUFISA farms survey (RS – raspberry)



**Figure 53. Duration of agreement – collective vs. individual**

Source: SUFISA farms survey (RS – raspberry)

The price is self-reported and based on average raspberry price during the observed year (2016/17). The interviewees were also asked to explain how the contract arrangement was set related to price discovery process and payments to farmers.

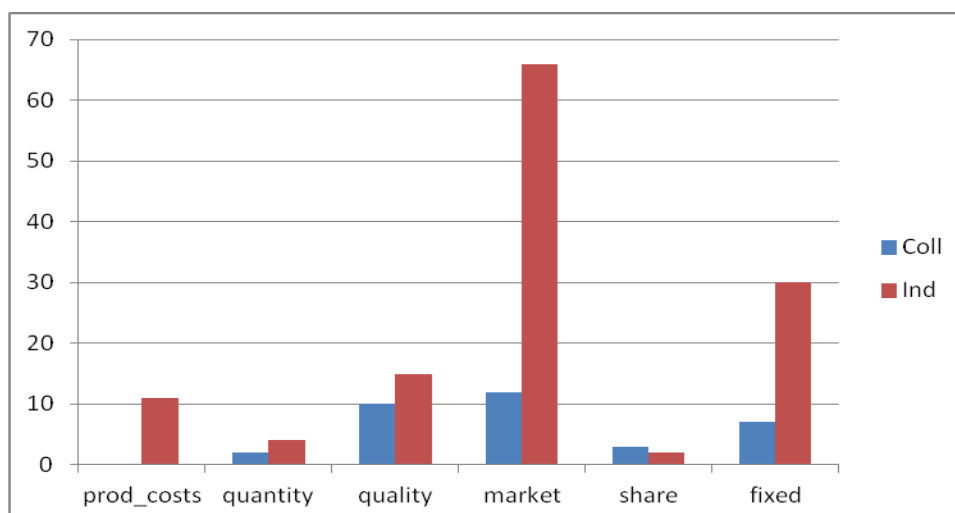


**Figure 54. Price and delivery settlement: (a) how is the price defined? (b) when are the payments made?**

Source: SUFISA farms survey (RS – raspberry)

The majority of farmers indicated (n=123) that the raspberry price is variable and linked to market price at the time of delivery, while for a significant number of farms the price is based on the quality of delivered raspberries (n=80). If we look at individual vs. collective sale channel subsamples (Figure 55), variable price market determined is mainly chosen above other types of price determination.

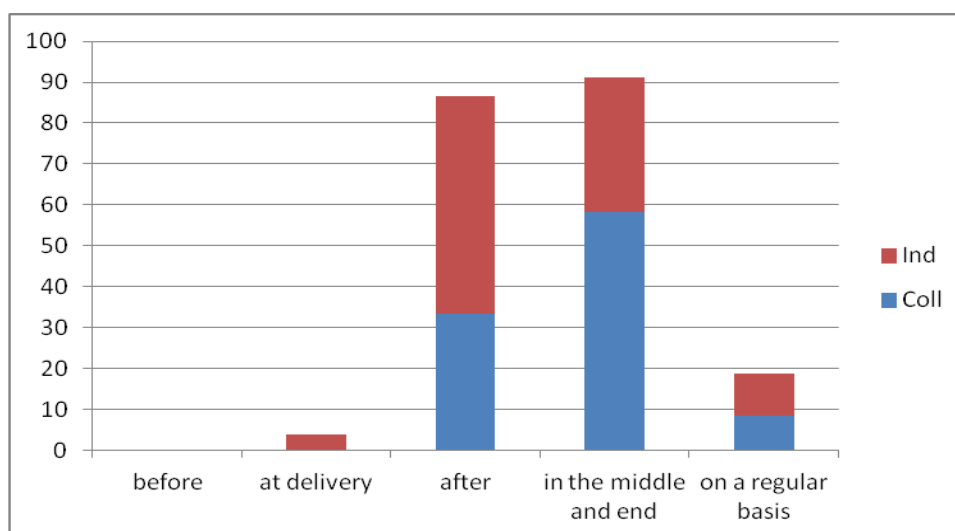




**Figure 55. Price formation - collective vs. individual arrangement**

Source: SUFISA farms survey (RS – raspberry)/individual sale channels

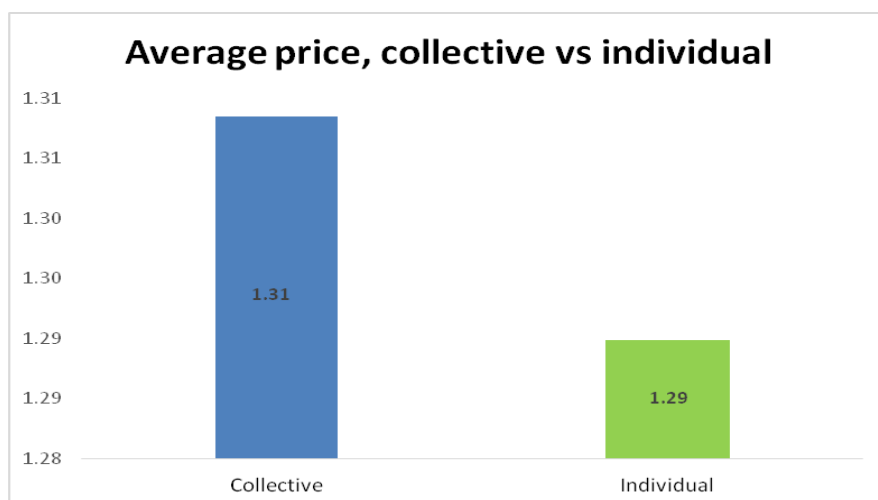
Payments for delivered products (see Figure 56) are commonly made after delivery (n=72), or at the time of delivery (n=36). When the agreement to sell products include in the middle and end of production payment, it often refers to specific individual arrangements with local traders who sell inputs such as fertilizers or other chemicals for raspberry production, and finally buys products in the harvest season. In the case of small producers, traders also offer different products for their household consumption.



**Figure 56. Payments - collective vs. individual sales channels**

Source: SUFISA farms survey (RS – raspberry)

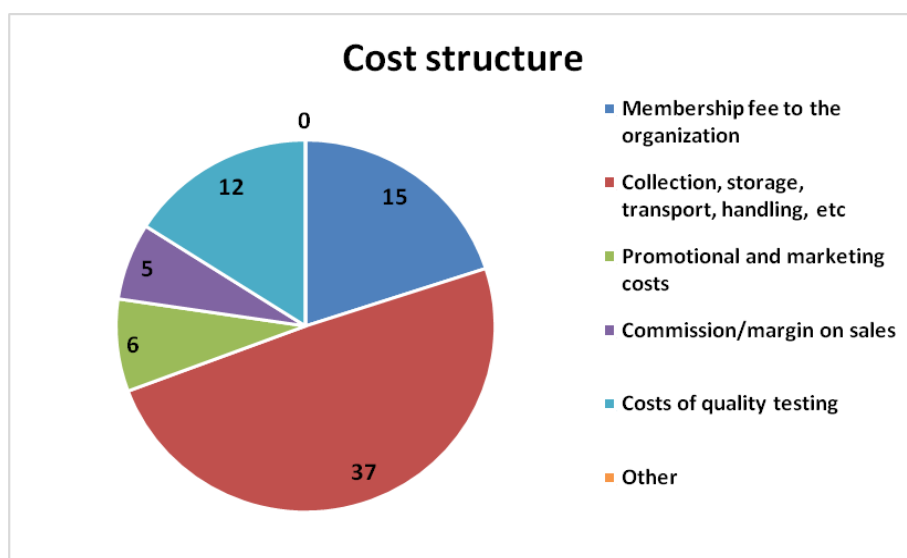
The average raspberry selling price was EUR 1.29 per kg in the total sample of farms. Collective sale channels managed to reach a higher commodity price of EUR 1.31 per kg in comparison to individual ones with a price of EUR 1.29 per kg, on average (Figure 56).



**Figure 57. Average price for selling raspberry**

Source: SUFISA farms survey (RS – raspberry)

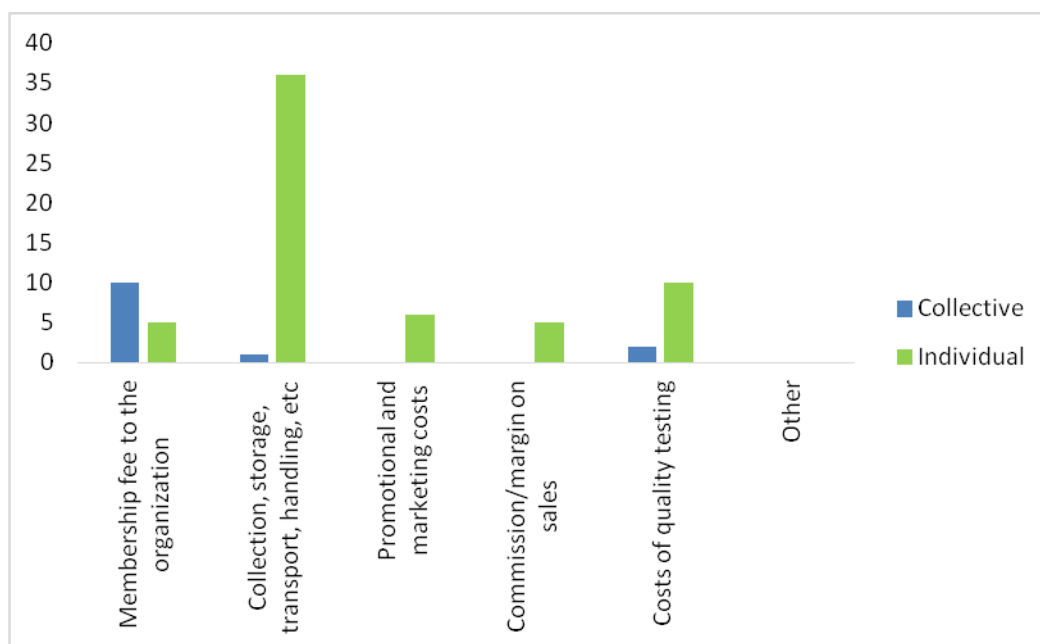
In the total sample of farms, production costs as share of selling price vary between 33-95% (being on average 64.85%). Concerning the cost structure, 37 farms stated that their main costs are related to bearing the costs of collection, storage, transport, handling, etc. while 15 farms have to pay membership fee to organization. Twelve farms bear the costs of quality testing. Five farms bear the costs of promotional and marketing costs. Two farms bear the costs of commission/margin on sales. One farm bears the costs of other.



**Figure 58. Cost structure of surveyed farms**

Source: SUFISA farms survey (RS – raspberry)

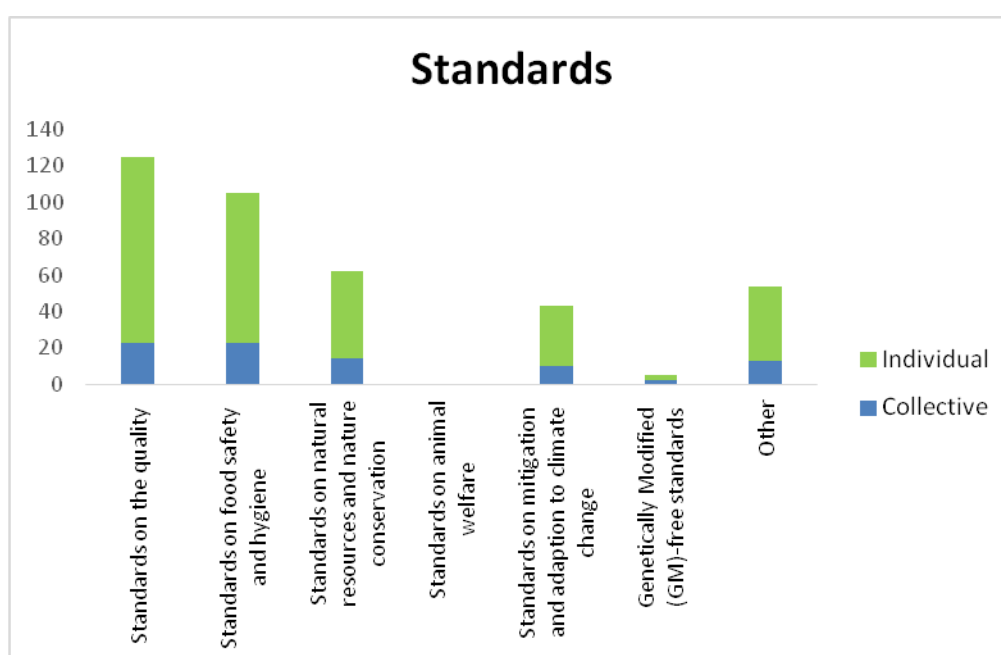
Further look at subsamples indicates that while in individual sale channels dominant costs are the costs of collection, storage, transport, handling, etc., in collective sale channel, the main cost category is membership fee to organization.



**Figure 59. Cost structure - collective vs. individual sales arrangements**

Source: SUFISA farms survey (RS – raspberry)

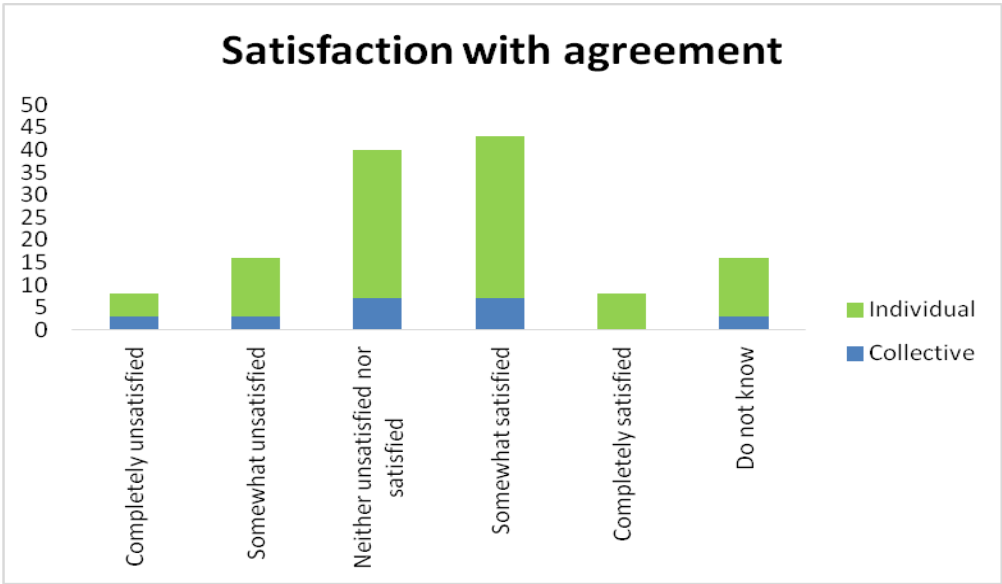
Among the relevant standards, the ones on quality and food safety are dominantly imposed to both collective and individual sale channels. Animal welfare is not mentioned at all among implemented standards, while standards related to preservation of nature and environment, as well as standards related to mitigation and adoption to climate change are recognized as less important. Finally, all agricultural production in Serbia is under strong regulation of non-GMO standards.



**Figure 60- Standards implemented in sales agreements**

Source: SUFISA farms survey (RS – raspberry)

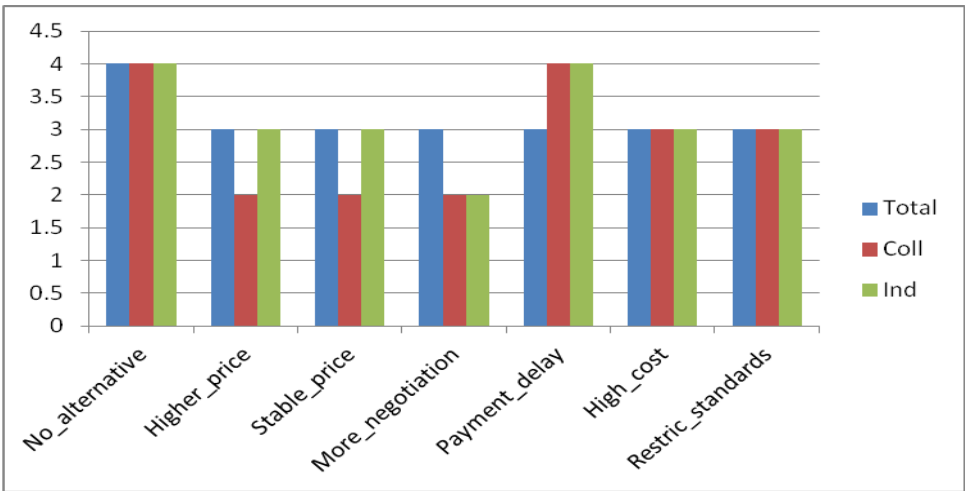
Finally, the level of satisfaction in both subsamples indicates that farmers are (somewhat) satisfied with sale agreements (Figure 60). This also provides opportunities for further improvements in the future.



**Figure 61. Satisfaction with sales agreement**

Source: SUFISA farms survey (RS – raspberry)

Figure 62 shows how farmers perceive the level of their satisfaction with existing sale arrangement regarding specific issues such as the achieved price level, the quality of negotiation process, control of costs and standards involvement in contracting. The respondents highly agree that there are no other alternatives to sell their products in practice, and that delay in payments are common for observed types of sales channels (collective and individual).

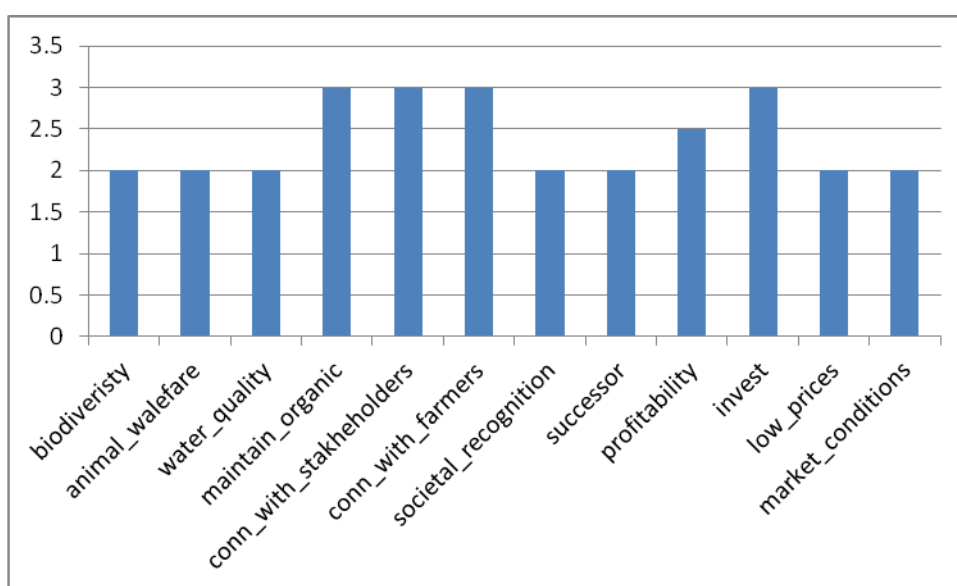


**Figure 62. Farmers’ perception of overall quality of sale arrangement (median mark)**

Source: SUFISA farms survey (RS – raspberry)

#### 7.8.4 Sustainability: results of section C1

This section is about the potential impact on sustainability of sales agreement. The farmers were asked about the production choices they made in relation to their main sale agreement/membership. They supposed to score (1 strongly disagree - 5 strongly agree) different aspects of: environment (biodiversity, water quality, animal welfare, and soil quality), society (relation to the buyers and input providers, relation with other farmers, social status, and successor aspects), and economy (profitability, investment, prices, and market conditions).



**Figure 63. The perception of the overall arrangement influence on farms sustainability**

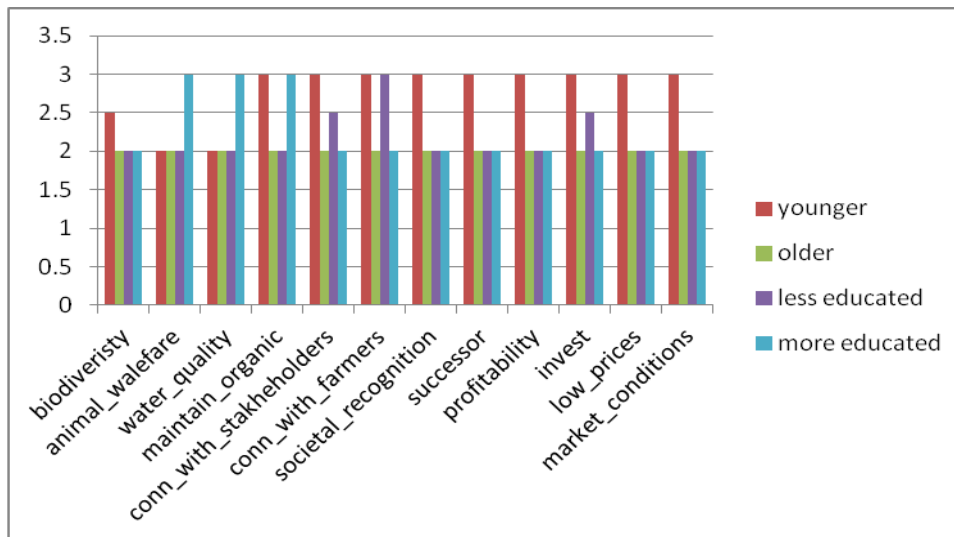
Source: SUFISA farms survey (RS – raspberry)

The results show that the perceived knowledge of raspberry producers/farmers about overall sustainability is rather low (Figure 63). The lowest level of knowledge is about the ecological aspects. The farmers relatively more agree with the issue considering soil quality (the ecological conditions of the raspberry production are mostly connected to the soil type and quality, as well as the microclimatic conditions). However, the biodiversity and the water quality maintenance are considered to be not so important. The farmers probably do not have enough knowledge about the consequences of the fertilizers and chemicals usage to the ecosystem, and consequently to their raspberry production as well. On the other side, the farmers highly appreciate the influence of the social network developing with other stakeholders and farmers in the sector, and this influence is reported as the most important aspect of the social sustainability. This should be considered in the context of the experience that raspberry producers in Serbia had in the Arilje region, where is the highest raspberry production and the most developed market, and experience in other, less developed regions. It is confirmed that association of the raspberry producers/farmers results with better economic conditions for their sales agreement. And also, cooperation with buyers or input providers, provide the farmers much more sustainability.

However, the analysis of the economic sustainability indicates strong division between farmers and other actors in the market chain. The farmers do not think that market conditions or the factors that shape the

final market prices are so much important in their economic sustainability, as investment in production and profitability maintenance are. This is important because the raspberry producers and buyers/exporters in Serbia still couldn't achieve sustainable raspberry production yet, in which both sides will be satisfied with the agreed minimum. So, the farmers think that their personal engagement through investment and profitability is the most important for the economic sustainability and that other conditions do not influence greatly on them.

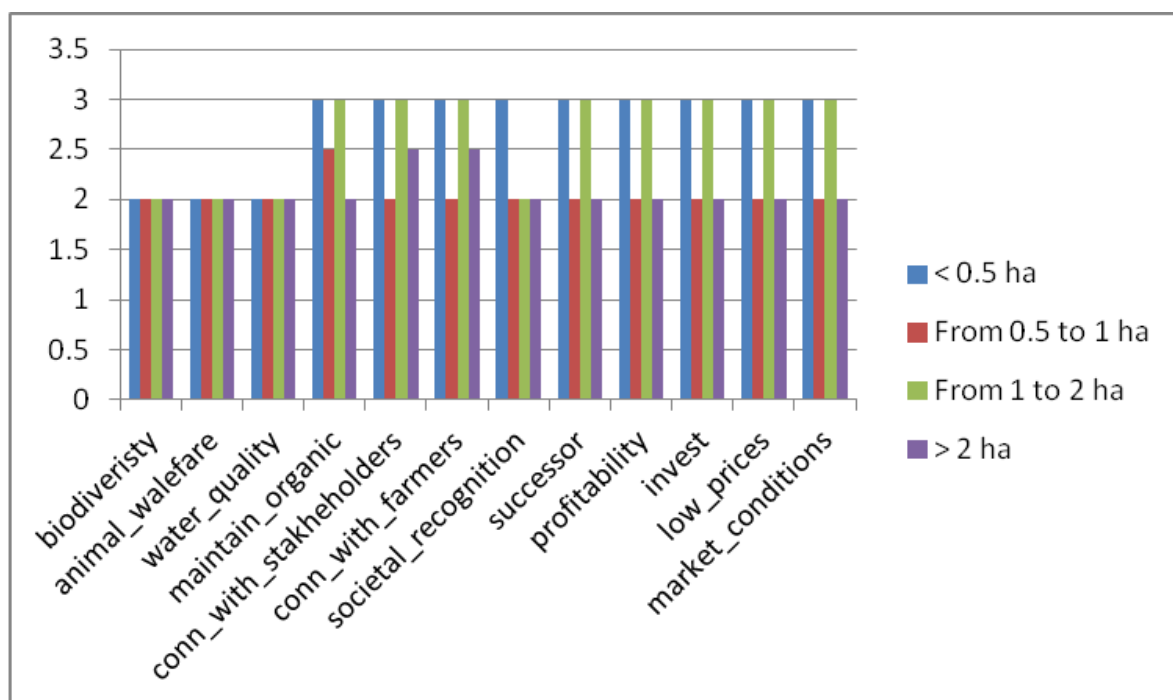
It is, also interesting, to analyse the perception of the overall arrangement influence on farms sustainability according to different producers groups, based on age and education structure (see Figure 64).



**Figure 64. Perception of overall arrangement influence on farms sustainability according to the producer's age and education structure**

Source: SUFISA farms survey (RS – raspberry)

It is evident that younger producers perceive more of the social, economic and environmental conditions of the sales agreement sustainability to be important than older producers. But, it must be mentioned here that considerable number of older producers did not understand many of the asked questions considering these sustainability conditions. So, they answered the most of them as they "do not know" with their influence over the production sustainability. Considering the producers' educational structure, it is noticed that more educated producers were more conscious about ecological and environment conditions of sustainability, while less educated farmers were much more convinced that connections with other farmers and stakeholders as well as the investments, are the most important factors of their production sustainability. In the overall analysis, the results are quite expected: the older and probably less educated producers rely much more on the personal or other producer's experience as well as on the financial support, while the younger and more educated producers take into account some other conditions as well.



**Figure 65. Perception on overall arrangement influence on farms sustainability according to the farm size**

Source: SUFISA farms survey (RS – raspberry)

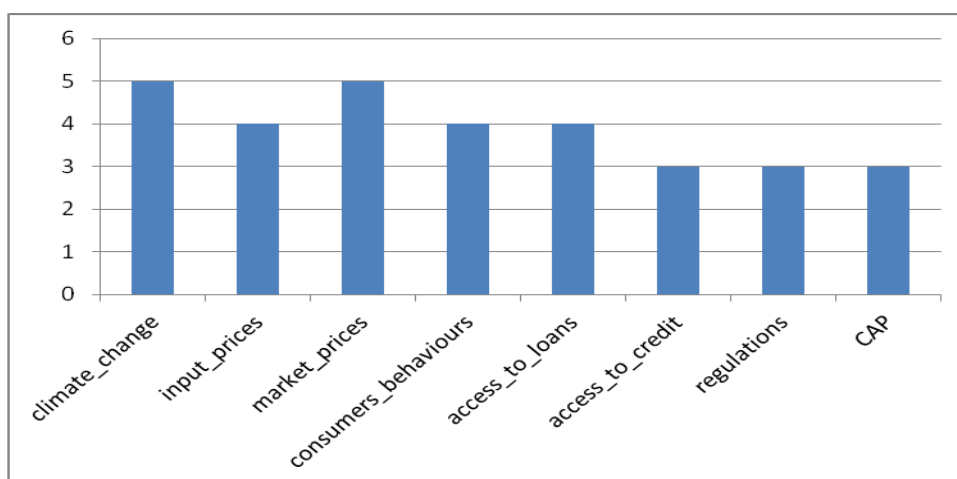
The results about sale agreement sustainability factors must be analysed also among the farm size aspect (Figure 65). The raspberry production in Serbia is mostly distributed in the western and south-western parts of the country, which is hilly and mostly represented with small average farm size (mostly up to 3 ha). This production is also mostly family type production, where one family, having small arable area, produce raspberries on most of its arable land and mostly as an additional economic activity (one or two family members are employed somewhere else, in industry for example, and have raspberry production as an additional income). From that point of view, these small producers (farm size up to 1 ha) are more specialized in raspberry production (they produce only raspberry). However, the producers with the average farm size over 1 ha, usually produce something more apart from raspberry (the larger the farm size is, the smaller the share of arable land for raspberry plantation is). One could say that they have larger raspberry production, but that they are less specialized. However, these producers could be much closer to the “industrial production” (their production requires much more investment and their income are much bigger, so their opinion about the production sustainability will differ from the small ones).

Environmental sustainability is the least important according to all kinds of producers (the exception is the soil quality). For the most farms networking, as well as cooperation with buyers, are rated as the most important factors from the social sustainability aspect. Additionally, in the economical sustainability analysis it is interesting that the same answers were given by two different groups according to the farm size. The only logical interpretation of such results could be the fact that their agriculture production structure is similar in some aspects (farm size from 0.5-1 ha and over 2 ha). The most of those farms are less specialized in raspberry production (the share of the arable land for raspberry production ranges from 10% for the largest farms up to 80% for the smallest farms). So, the other agriculture production could be used as some sort of “buffer” in the years when market conditions and the prices of the raspberry production are not so good. Also, those farmers do not invest everything in raspberry but also in some other agriculture products.

### Farmer's perceptions of different factors that will influence sustainability in the future

The final part of the questionnaire was dedicated to the wider strategies producers adopt in their farming activities. The analysis started with the questions about potential factors that can drive farming decisions, such as adverse climatic conditions, pests, and market volatility. It was interesting to find out to what extent certain factors might influence the producers' decisions regarding their production and farming strategies. It considers environmental factors such as climate conditions and biological aspects (pests, plant disease), market conditions (drop in market prices, consumer behaviour, state regulations that affects market), and institutional conditions (CAP). The answers were scored from 1 (not at all) to 5 (strongly).

The obtained results are in the range of expectations: the largest influences are related to climate change and market conditions (Figure 66). According to the scientific researches, the climate conditions are changing (more often climate hazards such as drought, late frosts, hail), but this confirms the producer experience as well. On the other hand, among different market conditions, the volatility of market price has been valued as the most important. According to the raspberry producers, the least influence on the future farms sustainability will be institutional regulations and some state regulations (Serbia still isn't an EU member although it is in the process of pre-accession negotiation, and a lot of people do not know anything about CAP or its possible influence once Serbia becomes a part of the EU. Only the largest producers are interesting in some financial instruments such as loans for capital investments, and the credits are not so popular among small producer because of the uncertainty of the production itself.



**Figure 66. Different factors influence on the farms sustainability in the future**

Source: SUFISA farms survey (RS – raspberry)

The results of this analysis among different group of producers (Table 34) are not so much different (age and educational structure) as well as among different farms (according to their size). Almost every group singled out the same set of the factors that will have the largest influence on the production sustainability in the future: climate change, market prices, and input prices. Slight differences appear among older and less educated producers when the input prices are questioned (they think it is less important). Also some differences are noticed for access to loans, which is more important for larger producers.



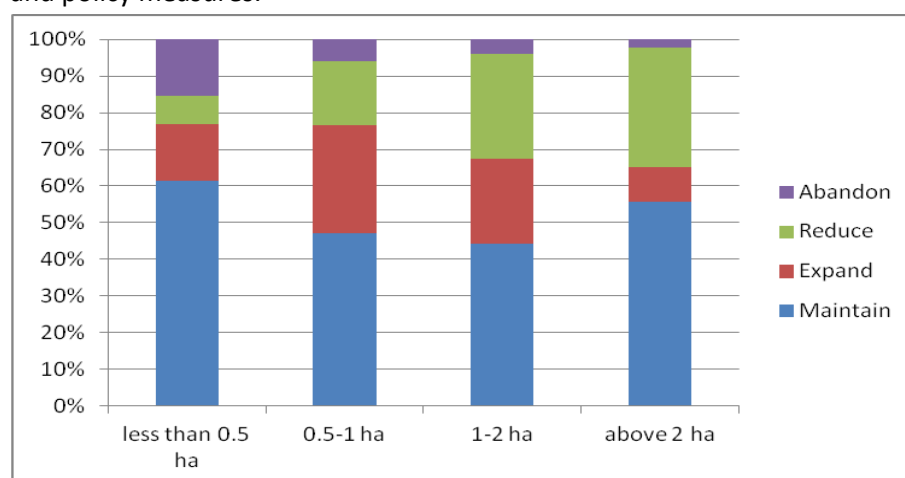
**Table 33: Different farmers groups and the factors influence on the farmers sustainability in the future**

	younger	older	less educated	more educated	< 0.5 ha	0.5 to 1 ha	1 to 2 ha	> 2 ha
climate_change	5	5	5	5	5	5	5	5
input_prices	5	4	4	5	5	5	4	4
market_prices	4	4	4.5	5	5	5	4	5
consumers_behaviours	4	4	4	4	4	4	4	4
access_to_loans	3	4	4	3	3	3	4	4
access_to_credit	3	3	3	3	3	3	3	3
regulations	2.5	3	3	3	3	2	3	3
CAP	3	2	3	3	3	2	3	3

Source: SUFISA farms survey (RS – raspberry)

### 7.8.5 Strategies and drivers of farming: results of section D

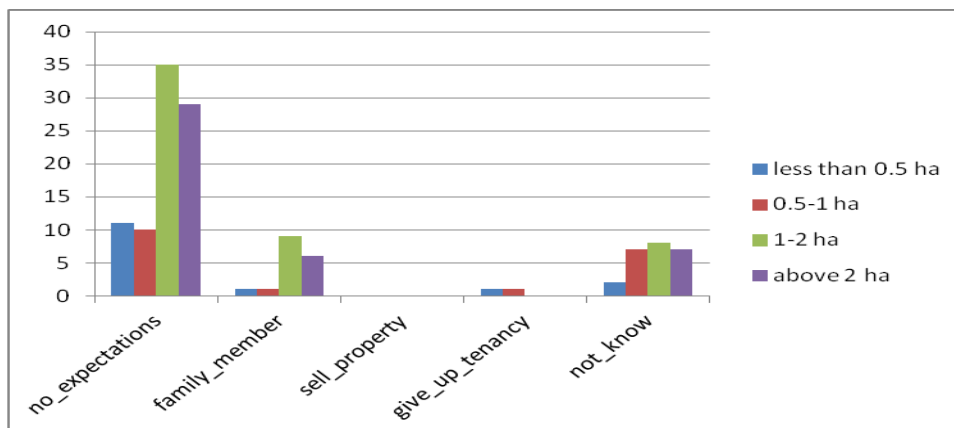
One of the main goals of this research is to stress out future perspectives of small family farms in the Region of Sumadija and Western Serbia in the raspberry sector. These results are derived from producers' point of view and how important they think different factors that will influence sustainability of farmers businesses in the next five years are. Farmers were asked to mark importance of different factors that were previously identified during the qualitative research such as climate change, price fluctuations (both of inputs and outputs), changing of consumer preferences, access to loans and credit, and changing regulation and policy measures.

**Figure 67. Strategies in the coming five years**

Source: SUFISA farms survey (RS – raspberry)

The surveyed farmers reported what their strategies for the development of raspberries within the context of their farm business in the coming five years are. The majority of farmers indicated to maintain production (see Figure 67). A slightly different result holds the group of farmers with total area from 1 up to 2 ha, where a higher share of other strategic alternatives were noticed. Further expanding production is more important for this group of farmers, as well for the group above 2 ha than in other groups. The highest share of response "to abandon farming" was reported in group of micro (very small) farms with area under 0.5 ha. In line with previously mentioned intentions, most farmers don't have specific

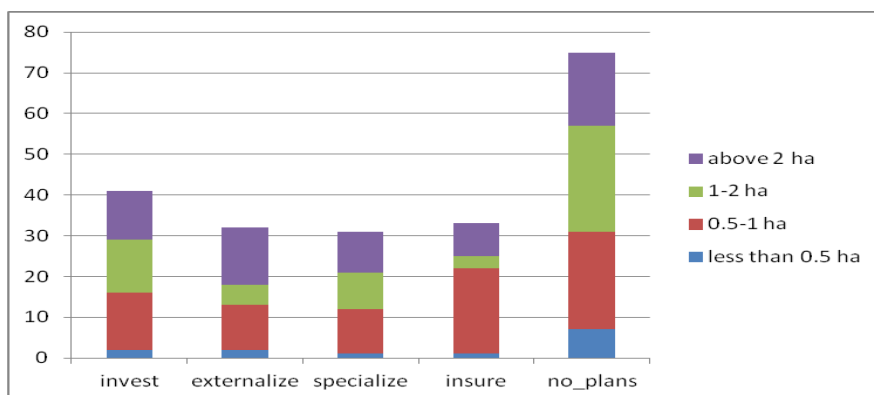
expectations regarding farm succession. This situation addresses huge demographic problems rural communities are facing in the geographic area covered by the research. If we add the answer “don’t know”, it reaches more than 4/5 of the sample. However, farmers don’t consider selling the property as the valid solution (see Figure 68).



**Figure 68. Succession of the farm**

Source: SUFISA farms survey (RS – raspberry)

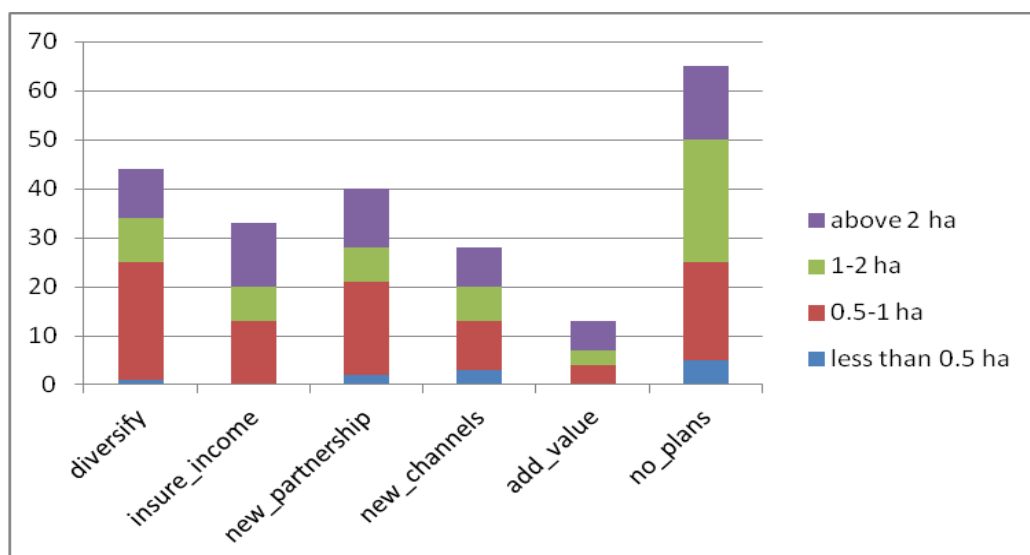
When it comes to the specific strategies to be implemented in farmers’ production activities (Figure 69), our research shows highly indifferent answers of raspberry farmers in general, as they usually don’t have specific production plans. The largest farms (above 2 ha) want to externalize their production more than other farm size groups, while farms from 0.5 up to 1 ha pay a lot of attention to insurance against different kind of risks they are exposed to. It is indicative that, compared to other strategies to be implemented, insurance is the least represented in the case of farms from 1 up to 2 ha. This result can be explained by the fact that these farms, more than others, intend to invest in the future, which will reduce the available amount of funds for payment of the insurance premium. However, such a situation is not favorable in terms of the financial stability of these farmers, because their yields are exposed to the same risks as in the case of smaller farms, while the losses due to the realization of these risks, in the absolute amount, may be higher. In general, the indifference of raspberry producers in terms of strategies to be implemented does not support the future development of their production. It is therefore necessary to intensify country-level activities in order to encourage farmers to adopt and implement these strategies, including consideration of the possibility of introducing obligatory agricultural insurance.



**Figure 69. Future actions in production reported by farm size**

Source: SUFISA farms survey (RS – raspberry)

Similarly to production, market plans are without a clear vision in most cases (Figure 70). However, small farms (up to 0.5 ha) put attention on diversification and new partnership as the main strategies they are going to implement in the future. The largest group of farmers plan to improve income insurance as well as develop new partnership. The sector obviously seeks for further improvements in the area of institutional arrangements as the high demand for new, high quality marketing channels exists. It is also important to note that the farmers did almost not select the answer option "planning to add value to raspberries that they produce (e.g., conversion to organic).



**Figure 70. Future actions regarding market plans reported by farm size**

Source: SUFISA farms survey (RS – raspberry)

The main results of our quantitative research on Serbian raspberry farmers can be summarized as follows:

- The analysis is focused on small family farms (from 0.5 to 1 ha used for raspberry production and with a long tradition in producing raspberry). Small family farms with specialized raspberry production are more represented in our sample.
- The average income per farm is EUR 11,180, and the average share of cost in total income collected in raspberry production is around 65%.
- Individual sales channels dominate the collective ones in number of farms (n=108 for individual vs. n=23 for collective). The lack of „collective” is previously indicated as one of the major obstacles and, at the same time, the opportunity for development of this particular agricultural sector in Serbia.
- Farmers are (somewhat) satisfied with the sale agreements. This also leaves the room for further improvements in the future.
- The average income generated and average raspberry price achieved is higher for the group of younger farmers (below 40 years). This group leads also with technological improvements resulting in the lowest share of cost in self-reported average price of product (56.46%).

- The price reached in sales agreements is higher on farms managed by higher educated farmers as well.
- A legal contract before or during production is mostly used. Most sales agreements are made either for this particular sale, or they last between 7 months and 1 year.
- The raspberry price is mostly variable and linked to market price at the time of delivery. Payments for delivered products are commonly made after or at the time of delivery.
- The standards on quality and food safety are mainly imposed to both collective and individual sale channels. Animal welfare is not mentioned at all, while standards related to preservation of nature and environment, as well as standards related to mitigation and adoption to climate change are recognized as less important.
- There are no other alternatives to sell their products and payments to farmers are made with significant delay. Even farmers that use collective arrangements report a lower level of agreement with statements related to higher price achievement, stabile price and fair negotiation.
- Farmers do not know much about overall production sustainability (the ecological aspects are considered to be the less important).
- Farmers perceive the largest influences on farms sustainability in the future related to climate change and market conditions, while the least influence on the future farms sustainability will be the regulations.
- The surveyed farms reported the dominant intention to maintain production in the future. The majority of farmers don't have specific expectations regarding farm succession. This situation addresses a huge demographic problem in the rural community.

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## 8 Annex 1 - The qualitative research guidelines (FGD in Serbian)

**I STARTING** from the key issues (UoG) and in the final Task 2.3 guidelines developed by Evora, Gloucestershire and Leuven teams.

### II General Structure

Introduction - 5 min

Exercise 1. The sector issues and sustainability - 15-20 min

Exercise 2. Discussion regarding the issues identified in WP1-WP2 regarding the sector sustainability - 25-30 min

Exercise 3. The sector sustainability in the future - 15-20 min

### III STRUCTURE OF THE FGDs / IN-Depth interviews in Serbia

Group	Stakeholder	Form/no of groups
Primary sector	Small family farms	1 (6-10 participants)
Primary sector	Larger farms/associations	1 (6-10 participants)
Secondary and Tertiary sector	Food industry/Traders/Financial organizations (6-8)	IN-depth (experts interviews) 13
Policy level	Policy Makers	1 (6-10 participants)  Representatives of Ministry, Chambers (national and regional), experts in the field

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<sup>13</sup> Based on the our experience, it is always hard to ask and to make appointment with high officilas in companies and banking/insurance sector. Therefore, we would prefer short conversation individually with their representatives based on the in-depth interview technic. The FGD questions will be slightly modified based on the expertise and the role of the interviewee organization in the food chain.

## Part 2 - FGD Wheat sector (in Serbian)

### UVOD

Cilj je da zajednički pričamo o problemima, poslovanju i strategijama svih učesnika u sistemu snabdevanja pšenicom.

#### Vežba 1. Problemi i održivost.

1a. Kada kažem ODRŽIVOST, koje su vaše prve misli / razmišljanja na ovu temu? Objasnite.

- Napredni proizvođač:
- Srednji proizvođač:
- Marginalni proizvođač:

Koje aktivnosti preduzimate kako bi obezbedili održivost vaših aktivnosti / poslovanja?

- Napredni proizvođač:
- Srednji proizvođač:
- Marginalni proizvođač:

1b. Molim Vas da identifikujete tri najvažnija problema sa kojima se susreće sektor malinarstva u proteklih pet godina.

- Napredni proizvođač:
- Srednji proizvođač:
- Marginalni proizvođač:

Zašto ste izdvojili baš te probleme?

Koji je problem po vašem mišljenju najvažniji od izdvojenih?

Koja su moguća rešenja?

Kako se borite protiv ovih problema, koje su vaše strategije?

#### Vežba 2. Šta su naša istraživanja pokazala? Koji su najvažniji problemi?

Analizirali smo regulatorne uslove poslovanja, mere agrarne i ruralne politike i tržište u okviru našeg istraživanja i identifikovali četiri bitna problema sa kojima se suočavaju poljoprivredni proizvođači (ne samo u sektoru malinarstva). To su:

1. Organizacija sistema snabdevanja hranom / odredjenim proizvodom (položaj pojedinih aktera unutar sistema, ko kreira netododatu vrednost, horizontalna i vertikalna integracija, forme ugovora...) -

Da li saradjujete sa ostalim proizvođačima ili akterima unutar sistema?

- Napredni proizvođač:



- Srednji proizvođač:

- Marginalni proizvođač:

Kako to funkcionira? Da li je bilo problema?

- Napredni proizvođač:

- Srednji proizvođač:

- Marginalni proizvođač:

2. Promene na tržištu (cene, tržišni rizici, finansijski problemi - mogućnost dobijanja kredita, investicije i nove tehnologije...) -

Koja su vaša najvažnija tržišta?

Kako se promene na ovim tržištima odražavaju na vaše poslovanje?

- Napredni proizvođač:

- Srednji proizvođač:

- Marginalni proizvođač:

Da li promene preferencija potrošača imaju uticaja na Vašu poziciju?

- Napredni proizvođač:

- Srednji proizvođač:

- Marginalni proizvođač:

Da li razmišljate o certifikaciji proizvoda i kako to da iskoristite najbolje (organska)?

- Napredni proizvođač:

- Srednji proizvođač:

- Marginalni proizvođač:

Kako finansirate svoju aktivnost?

- Napredni proizvođač:

- Srednji proizvođač:

- Marginalni proizvođač:

3. Zemljište i okruženje - vlaništvo, lizink, državno zemljište i odnos prema okruženju (korišćenje hemikalija, degraacija zemljišta, klimatske promene i efekti i dr.).

Šta bi ste rekli o zakupu zemljišta?

- Napredni proizvođač:

- Srednji proizvođač:

- Marginalni proizvođač:

Da li odgovarate adekvatno na izazove vezane za zaštitu životne sredine?

- Napredni proizvođač:

- Srednji proizvođač:

- Marginalni proizvođač:

Da li vodite računa o socijalnim ciljevima (zaposlenje, lokalni razvoj...)?

- Napredni proizvođač:

- Srednji proizvođač:

- Marginalni proizvođač:

4. Okvir za vođenje politike - mere ruralne i agrarne politike -

Da li postojeći okvir pomaže da unapredite svoje poslovanje?

Da li možete da utičete na donošenje odluka?

- Napredni proizvođač:

- Srednji proizvođač:

- Marginalni proizvođač:

Šta mislite o ovim grupama problema?

Koje bi probleme izdvojili kao posebno važne iz vaše perspektive?

Kako ovi problemi utiču na održivost?

Šta možete da učinite da bi se ovi problemi rešili?

- Napredni proizvođač:

- Srednji proizvođač:

- Marginalni proizvođač:

NAPOMENA: Sa sličnim problemima se suočavaju i poljoprivredni proizvođači u drugim zemljama Evrope (mi istražujemo poziciju u više zemalja - Srbija je jedina kandidat za članstvo, sve ostale su članice EU, jedna izašla iz EU - VB, uključeni Nemačka, Italija, Portugalija, Francuska, Poljska, Holandija, Danska, Španija). Naš je cilj da u narednoj godini istraživanja sistematizujemo probleme i tražimo moguće solucije po ugledu na najuspešnije zemlje.

Vežba 3. Održivost sistema u budućnosti

Zamislite Vaše poslovanje u 2027. godini (za deset godina). Opišite svoj položaj na tržištu. Koji će faktori uticati najviše na poslovanje poljoprivrednih proizvođača?

Koje ćete strategije primenjivati kako bi poslovali uspešno?

Koja bi strategija dovela do najboljih rezultata u ekonomskom smislu? Da li razmišljate i na koji način o efektima na socijalno i životno okruženje?

- Napredni proizvođač:

- Srednji proizvođač:

- Marginalni proizvođač:

Kraj.

### **Part 3 - FGD Raspberry sector (in Serbian)**

#### **UVOD**

O SUFISA projektu, uloga nacionalnih partnera (Ekonomski fakultet Beograd, Opština Arilje)

Cilj je da zajednički pričamo o problemima, poslovanju i strategijama svih učesnika u sistemu snabdevanja malinom koje mogu dovesti do poželjnog rezultata u razvoju sektora malinarstva u Srbiji.

Vežba 1. Problemi i održivost.

1a. Kada kažem održivost, koje su vaše prve misli / razmišljanja na ovu temu?

Koje aktivnosti preduzimate kako bi obezbedili održivost vaših aktivnosti / poslovanja?

1b. Molim Vas da identifikujete tri najvažnija problema sa kojima se susreće sektor malinarstva u proteklih pet godina.

Zašto ste izdvojili baš te probleme?

Koji je problem po vašem mišljenju najvažniji od izdvojenih?

Koja su moguća rešenja?

Kako se borite protiv ovih problema, koje su vaše strategije?

Vežba 2. Šta su naša istraživanja pokazala? Koji su najvažniji problemi?

Analizirali smo regulatorne uslove poslovanja, mere agrarne i ruralne politike i tržište u okviru našeg istraživanja i identifikovali četiri bitna problema sa kojima se suočavaju poljoprivredni proizvođači (ne samo u sektoru malinarstva). To su:

1. Organizacija sistema snabdevanja hranom / određenim proizvodom (položaj pojedinih aktera unutar sistema, ko kreira netododatu vrednost, horizontalna i vertikalna integracija, forme ugovora...) -

Da li saradjujete sa ostalim proizvođačima ili akterima unutar sistema?

Kako to funkcioniše? Da li je bilo problema?

2. Promene na tržištu (cene, tržišni rizici, finansijski problemi - mogućnost dobijanja kredita, investicije i nove tehnologije...) -

Koja su vaša najvažnija tržišta?

Kako se promene na ovim tržištima odražavaju na vaše poslovanje?

Da li promene preferencija potrošača imaju uticaja na Vašu poziciju?

Da li razmišljate o certifikaciji proizvoda (organska, ariljska...) i kako to da iskoristite najbolje?

Kako finansirate svoju aktivnost?

3. Zemljište i okruženje - vlaništvo, lizink, državno zemljište i odnos prema okruženju (korišćenje hemikalija, degraacija zemljišta, klimatske promene i efekti i dr.).

Da li odgovarate adekvatno na izazove vezane za zaštitu životne sredine?

Da li vodite računa o socijalnim ciljevima (zaposlenje, lokalni razvoj...)?

4. Okvir za vođenje politike - mere ruralne i agrarne politike -

Da li postojeći okvir pomaže da unapredite svoje poslovanje?

Da li možete da utičete na donošenje odluka?

Šta mislite o ovim grupama problema?

Koje bi probleme izdvojili kao posebno važne iz vaše perspektive?

Kako ovi problemi utiču na održivost?

Šta možete da učinite da bi se ovi problemi rešili?

NAPOMENA: Sa sličnim problemima se suočavaju i poljoprivredni proizvođači u drugim zemljama Evrope (mi istražujemo poziciju u više zemalja - Srbija je jedina kandidat za članstvo, sve ostale su članice EU, jedna izašla iz EU - VB, uključeni Nemačka, Italija, Portugalija, Francuska, Poljska, Holandija, Danska, Španija). Naš je cilj da u narednoj godini istraživanja sistematizujemo probleme i tražimo moguće solucije po ugledu na najuspešnije zemlje.

Vežba 3. Održivost sistema u budućnosti

Zamislite Vaše poslovanje u 2027. godini (za deset godina). Opišite svoj položaj na tržištu. Koji će faktori uticati najviše na poslovanje poljoprivrednih proizvođača?

Koje ćete strategije primenjivati kako bi poslovali uspešno?

Koja bi strategija dovela do najboljih rezultata u ekonomskom smislu? Da li razmišljate i na koji način o efektima na socijalno i životno okruženje?

Kraj.

## 9 Annex 2 - Quantitative research guidelines (in Serbian)

### UPUTSTVO ZA SPROVODJENJE UPITNIKA

Poslednji odeljak upitnika (Odeljak E) se popunjava na kraju. Za identifikaciju upitnika se koristi broj RS-SZS-1 do 100 (odnosno do poslednjeg broja upitnika koji je popunjen). Ukupno ima 100 odstampanih upitnika podeljenih u 10 delova buduci da na deset mesta po 10 upitnika treba podeliti i sačekati da proizvođači popune iste. Nije dozvoljen razgovor sa više lica iz jednog gazdinstva.

Ispitanik treba da bude vlasnik ili menadžer gazdinstva. Po pravilu, budući da su u pitanju privatna lica, u našem slučaju ispitanici će biti vlasnici gazdinstava. Ukoliko je ispitanik menadžer neke veće poljoprivredne organizacije, onda je reč o pravnom licu (kompaniji).

Ispitivanje se vrši za ekonomsku 2016/17. godinu koja je završena, odnosno o kojoj poljoprivrednik ima kompletne informacije.

Na većinu pitanja ispitanik odgovara izborom jedne od ponudjenih alternativa, tj. davanjem odgovora DA/NE, ili izražavanjem stepena slaganja sa iznetim tvrdnjama od 1-5. U nekoliko pitanja se traži navod tačnog broja, kao što su pitanja vezana za veličinu poljoprivrednog poseda, sertifikovane površine pod organskom proizvodnjom (ukoliko ih poljoprivrednih ima), procenat prodaje preko različitih kanala marketinga (vodite računa da ukupan zbir treba da bude 100 i da se odnosi na prisutnu prodaju kroz kolektivne kanale prodaje ili individualne).

Kod nekih pitanja je jasno naznačeno da li se vrši preskakanje ukoliko je negativan odgovor dobijen na osnovno (početno pitanje). Pratite uputstva. Takva su pitanja, na primer, QB.17, QB.23 i QB.29.

Kod pitanja QC.1 ubacite pretežni način prodaje (preko kog kanala marketinga – kolektivnog ili individualnog) na osnovu prethodno datog odgovora u pitanju QB.8 i QB.16. Ovim pitanjem fokusirate ispitanika na dalja pitanja i tražite potvrdu da mislite na isti kanal prodaje, jer se dalje ispituju forme ugovora i institucionalnog povezivanja u agraru.

Trudite se da odgovor ne znam bude što manje zastupljen. Ukoliko primetite da postoje problemi u realizaciji upitnika i imate dodatna pitanja, slobodno pozovite na dati broj telefona radi daljih razjašnjenja.

Od Vas se očekuje da kompletirate upitnike zaključno sa 7. januarom 2018. godine i da iste predate najkasnije u periodu između 8-10. januara 2018. godine. Nije potrebno da unosite upitnike u bazu.

Unapred hvala na saradnji,

Ekonomski fakultet Beograd

## 10 Annex 3 -The survey design and sample

### WP2.3 - Survey / BEL / Survey in Serbia

#### Sampling strategy

The **target population** is defined at the regional level:

NUTS 2	NUTS 3	Commodity
Serbia North	Vojvodina Region / Banat	wheat
Serbia South	Sumadija and West Serbia	raspberries

#### Obtaining a sample size

The **sample dimension**: n = 150 for each commodity group

Source: Census, 2012.

#### Case A/ Wheat producers - regions and farms population based on farm size

Region	Total	0-5 ha	5-20ha	20-100ha	>100 ha
Serbia North	126640	90741	26763	8624	512
Vojvodina	104617	71274	24425	8420	498
Banat	42825	27538	10842	4191	254
South Banat	19049	12099	4912	1948	90
Pančevo	4717	3444	928	336	9

Source: Agricultural Census 2012.

Focus is on commercial farms - **above 20 ha**.

$$ME = 1.96 \sqrt{\frac{p(1-p)}{n}}$$

Calculation of ME: Sample size allows a margin of error <10% for a significance level of 95%.

Region	Total	n/N	1-n/N	n/N*(1-n/N)	(n/N*(1-n/N))/150	sqrt	1,96*sqrt
Serbia North	9136	0,016419	0,983581	0,016149	0,000108	0,010375932	0,020337
Vojvodina (region)	8918	0,01682	0,98318	0,016537	0,00011	0,010499843	0,02058
<b>Banat (district)</b>	<b>4445</b>	<b>0,033746</b>	<b>0,966254</b>	<b>0,032607</b>	<b>0,000217</b>	<b>0,014743813</b>	<b>0,028898</b>
South Banat (subdistrict)	2038	0,073602	0,926398	0,068184	0,000455	0,021320472	0,041788
Pančevo (Municipality)	345	0,434783	0,565217	0,245747	0,001638	0,040476058	0,079333

N<sub>wheat</sub>= 4445 / Banat



Map of Serbia / Banat district within Vojvodina Region

## Case B / Raspberries - regions and farms population

Focus is on small family farms - less than 5ha.

Calculation of ME: Sample size allows a margin of error <10% for a significance level of 95%.

$N_{\text{raspberry}} = 10635 / \text{Sumadija and West Serbia - Total number of raspberries farms in the region}$

$n/N = 0,014$

ME= 0,019



Map of Serbia / Sumadija and West Serbia Region

Note: 72% of raspberries producers are located in two out of eight districts in the region. It might be useful to think about face-to-face surveys only in Zlatiborski and Macvanski districts.



## Ensuring representativeness

Primary producers that will be (randomly) contacted for inclusion in the survey. Representativeness is based on the regional distribution and farm size. Missing observations will be replaced by similar ones. Sample will be completed by recurrent checks for representativeness during data collection, contacting additional producers of underrepresented strata.

Tab.2 – Sample stratification by farm size of wheat farms in Banat

Holding dimension	Number of holdings in Banat by farm size	Proportion of holdings by farm size (weight of strata)	Sample of holdings by farm size
20-29,99 ha	1623	36,51	55
30-49,99 ha	1458	32,80	49
50-100 ha	1110	24,97	37
More than 100 ha	254	5,71	9
Total	4445	100,00	150

Source: BEL calculation on Agricultural Census 2012. data

Tab.3 – Sample stratification by farm size of raspberry farms in Region of Sumadija and West Serbia

Holding dimension	Number of holdings in SWS by farm size	Proportion of holdings by farm size (weight of strata)	Sample of holdings by farm size
Less than 0,5 ha	859	8,08	12
0,5-1 ha	1814	17,06	26
1-2 ha	2701	25,40	38
2-5 ha	5262	49,48	74
Total	10635	100,00	150

Source: BEL calculation on Agricultural Census 2012. data

## Data collection

**Method:** Face-to-face interviews (possibility: Interviews will be conducted throughout the agricultural extension offices located in the selected regions).

**Questionnaire:** 20 minutes maximum duration

**Total amount:** €6,400.

Tab. 4 – Timing of the producer survey in Serbia

Task	Timing	Comment
1 <b>Survey design guidelines and questionnaire</b>	March (Month 23) till Sept 2017 (Month 29);	Partners to comment on draft guidelines June 2017; further discussion at Aarhus meeting in July 2017
2 <b>Pilot producer survey in Serbia and feedback</b>	Sept 2017 (Month 29) Early Oct 2017 (M30)	BEL will interview about 10% of the primary producers in the sample in the selected regions and prepare the feedback form.
3 <b>Preparation for final survey</b>	Early Oct 2017 (M30)	Translation of the questionnaire Data entry form test
4 <b>Run producer survey</b>	Nov 2017 (Month 31) till Jan 2018 (Month 33)	
5 <b>Merge individual survey databases</b>	End Jan 2018 (Month 33)	Data Entry - Individual partner survey databases returned to UoG.
6 <b>Producers' survey report (D 2.4)</b>	April 2018 (Month 36)	WP leaders complete

#### Data entry:

The data collected will be delivered in the same dataset format and with the same coding of response data, based on a) an Excel template for the dataset and b) a list of codes for responses. A preview of the Excel dataset format is clear, two separate Excel files (one per region/commodity) will be sent to UoG based on the instructions.

Belgrade, 06/23/ 2017.

## **11 Annex 4 -The CSP inventory - the main inputs**

The Wheat Case Study inputs for CSP							
Issues	Condition	Strategy Group	Strategy	Indicators	Notes Condition	Notes Strategy	Notes Indicators
Land leasing	Factor access (land, labour, finance)	Political support	Lobby access	9. Social benefits.	The land-lease market in Serbia is currently more important than the land-sales market due to lacks of the proper legislative framework for the latter. The land market functioning is under the supervision and control of different mutually independent institutions: (1) The Government Geodetic Authority (GGA) manages the land cadastre. The lease market is characterised by insecure property rights and a relatively high lease tax that result in many lease transactions not being officially reported. Most of these transactions take place in the Region of Vojvodina with high quality soil. Due to unstable conditions, the land-lease contracts are often short-term and do not encourage medium-term investment in the	According to rules established by the Privatization Law, The Republic of Serbia has remained the owner of vast areas of arable agricultural land. The land owned by the Republic of Serbia is leased out to natural or legal persons after conducting the relevant leasing procedures before the authorities of local municipalities. Every agricultural producer (farmer), due to limited character of land as a fixed asset, has been interested in leasing as large an area of state-owned agricultural land as possible. However, the land market in Serbia still remains not functional, due to poor tended proprietary registers (institutional prerequisite for a good functioning land market is updated land registry	With better access to land market, farmers could think about productivity and profitability growth, which can lead to social benefits connected with farm sector age structure and other characteristics.

					land or in the development of the farm infrastructure.	which is not the case in our country). Additionally, in Vojvodina farmers have even resorted to physical altercations, blocking roads and similar methods in order to achieve the goal of leasing as much land as they can (derived from the public media sources and blogs). For example, the farmers often claim that they have been negatively affected by the actions in land leasing by municipalities which are denying them the right to purchase state-owned land under the same terms as big companies.	
Markets and logistic support	Market access	Markets, contracts and institutional arrangements	Market orientation (e.g. developing new markets, differentiation, standards and certification, adding value)	4. Improved access to markets.	The Organization of the Black Sea Economic Cooperation was founded on 1 May 1999 based on the Agreement for Black Sea economic cooperation of 25 June 1992. The BSEC Headquarters are located in Istanbul. The members of the organization are	The creation of a single transport system in the Black Sea region. The creation of logistics and transport infrastructure will significantly simplify physical access to joint agri-food value-added chains and improve their effectiveness.	

					Azerbaijan, Albania, Armenia, Bulgaria, Greece, Georgia, Moldova, Russian Federation, Romania, Serbia, Turkey and Ukraine		
Fragmented ownership structure	Ecological / environmental	Competitiveness, viability and risk management	Diversifying income sources, both on- and off-farm	3. Greater profitability, 5. Greater financial stability, 9. Social benefits.	Recently, the strategy took in importance particularly if we have in mind environmental protecting policy context: Steady planting of wheat and other winter crops occurred since winter crops suffered almost no damage from the extreme drought of the previous years and even experienced higher yields. Diversification also refers to their sources of income (around the agriculture).	Diversification.	Diversification might lead also to other benefits such as implementation of complementary activities of rural economy at the local level, such as tourism, trade and processing.
Market power of agricultural producers	Price levels / volatility	Markets, contracts and institutional arrangements	Collective arrangements (e.g. cooperatives, producer organisations, partnerships, horizontal cooperation, vertical	4. Improved access to markets, 5. Greater financial stability, 8. Strengthened negotiation power.	The weakest position in the Serbian food chain belongs to the farmers. They are unorganized, fragmented and left without adequate representation in different bodies responsible for governance. Even wheat	Straightening producers' power throughout producers groups, cooperatives, contracting. Institutional: Law on Competition. Law on Cooperatives; Farms level: production and marketing contracts and	Share of agricultural producers in added value and income distribution.

			integration)		producers who are larger than other agricultural producers on average have faced with problems during harvest when the price of their product is underestimated. The role of LAGs and producers groups in bottom-up approach of decision making could be of crucial importance for the straightening of agricultural producers' position within the food chain.	straightening producers' organizations. Cooperatives are seen as organization with less capacities to help agricultural producers than producers groups - producers have got negative experience with ag.coops due to socialist period and applied YU model of cooperatives.	
The extension service functioning	Technological	Competitiveness, viability and risk management	Reducing production costs	3. Greater profitability, 5. Greater financial stability, 6. Enhanced farm / business resilience, 7. Improved information and communication, 10. Environmental benefits.	There are huge possibilities for introduction the precision agriculture in Serbia, no matter which product we are talking about. Modern technology and sensors connected through Internet of Things and put in the spatial context, provide exact data for the exact location in real time. In such way the producers are able to manage their production in real time (they can see in which	Research institutes ask for better understanding of information economy and management system that is governed by more informed choices. The Agricultural Service advice agricultural producers how to use their resources in the most efficient and productive way. They use ITC system to communicate and to have on-line connection (system of prompt replay). Yields are increasing as more	Implementation of new technologies (IT) in agriculture, no. of registered users of specific free available public services (see illustration on ICT implementation in Vojvodina Region).

					parts of their parcels there is lower humidity, in which part of soil the chemical composition is different or changed, where the plants are damaged so that certain treatment is needed, and etc. the information could be classify in different levels: parcel level, or even on the level of individual perennial plant.	land is cultivated by professional producers who are better informed about new technologies and modern production equipment. Serbian wheat farmers use less than half the amount of chemical fertilizers than farmers in developed countries.	
Wheat quality	Regulation and policy	Markets, contracts and institutional arrangements	Contractualisation (e.g. short-, long-term contracts, hedging)	2. Added value, 3. Greater profitability, 4. Improved access to markets, 5. Greater financial stability, 8. Strengthened negotiation power.	Every year, agricultural producers are facing the same challenges like preserving the quality of their goods, deciding whether to sell their produce immediately after sowing or store it, securing finances for the entire production process etc. The warehouse receipt system enables agricultural producer to keep his produce in a warehouse which provides guarantees that the produce will be safe, and that its quality and quantity will be preserved.	Institutional: Public warehouse low, improvement of laboratories for fast quality control of wheat. Farms level: With warehouse receipts, agricultural producers can obtain favourable short-term loans to finance the production process, until that process is completed, without having to pledge the goods or use mortgage as a collateral.	No of warehouse receipts accepted as collateral for credit, use of long-term contracts and hedging.



Excessive and uncontrolled use of chemicals	Ecological / environmental	Social and environmental sustainability	Deliberate focus on environmental issues	1. Increased productivity, 3. Greater profitability, 5. Greater financial stability, 10. Environmental benefits.	Soil degradation due to excessive and uncontrolled use of chemicals.	Institutional level: The extension service development - development of the specific educational programs for end users (farmers), BIG data system development and efficient dissemination of knowledge; Farm strategy: Right to be educated and protected - workshops, trainings, LLL programmes, farmers are seen as the end users of transferred knowledge who actively support definition of training programmes etc.	Quality of soil, quality of water, quality of planting materials, pest use.
High uncertainty due to weather risk exposure	Ecological / environmental	Competitiveness, viability and risk management	Insurance	5. Greater financial stability, 6. Enhanced farm / business resilience, 10. Environmental benefits.	The state subsidizes insurance premiums for agriculture, while the municipality has the system of protection against heavy rains. Although awareness of the necessity of insurance is growing in recent years, the supply of insurance services is inconsistent. In many municipalities, the organization of the	A better organization is needed, the state does not support meteo-stations with adequate payments (often there are not enough missiles). In the practice better results are given by local initiatives in this area. Development of the state or local community meteo-stations that will help farmers to avoid unnecessary weather	% of producers, or % of land in ownership covered by insurance.

					<p>protection against heavy rains service is inadequate or doesn't even exist.</p>	<p>risks (heavy rains with hail), creating of the global reinsurance system (EuropaRe). Better irrigation is requested as well. Serbia is known for very low investments in irrigation systems. Having in mind climate change, it will be necessary to increase investments in technology improvements related to better use of water.</p>	
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The Raspberry Case Study inputs for CSP						
Issues	Condition	Notes Condition	Strategy Group	Strategy	Notes Strategy	Indicators
Infected planting material	Ecological / environmental	The infected planting material was imported 14 years ago. They are still in use influencing the appearance of fungi in the rainy years. It is a huge problem as raspberry producers don't know how to deal with it. It significantly reduces yields, although the planted surface is larger, and the root of the plant is dried.	Social and environmental sustainability.	Deliberate focus on environmental issues.	Integrative import control on input suppliers, The extension service development - development of the specific educational programs for end users (farmers). Farms level: Right to be educated and protected - workshops, trainings, LLL programmes, farmers are seen as the end users of transferred knowledge who actively support definition of training programmes etc.	10. Environmental benefits.
Lack of adequate scientific research that would support dissemination among farmers, Lack of laboratories	Technological	Primary raspberry producers are forced to experiment by themselves. They buy new varieties of raspberries and raise new experimental plantations under greenhouses, apply different technologies, monitor differences in yields and product quality. There is a lack of a common scientific approach to the advisory service that should help agricultural producers to overcome various barriers. There is also a lack of link between technological research and the needs of	Competitiveness, viability and risk management.	Technological innovation.	Institutional level: Public financing of data analysis for farm management decision making - Big data implementation for management purposes; Farms level: Intensive use of IT technologies for knowledge transfer - how we can make big data systems easily available for the average farmer: what chemicals and when should they use in their production to minimize environmental effects and maximize profit.	1. Increased productivity, 3. Greater profitability, 5. Greater financial stability, 7. Improved information and communication, 10. Environmental benefits.

		the sector.				
Inconsistent agricultural policy and inadequate state support	Regulation and policy	Policy is often changed without a clear goal, it does not deal with rural development at all. The agricultural budget is constantly changing, but its structure deviates from the EU model. There is a trend to reduce budget expenditures for the food and rural development sector over the past five years.	Political support.	Subsidies and grants.	Institutional level: Consistent agricultural policy & long term planning: what should be our priorities in the next 10-15 years? Farms level: To be prepared for efficient use of available additional resources such as subsidies both on national and local level.	5. Greater financial stability, 9. Social benefits.
Financing production	Factor access (land, labour, finance)	The Ministry of Agriculture has introduced short-term and long-term lending programs, under more favourable terms than bank loans give, but these conditions can hardly be met by small producers.	Competitiveness, viability and risk management.	Financial management (including liquidity, loans, debt).	Establishment of micro-finance institutions (particularly important for small businesses), designing of the specific farms credit arrangements - banks should be supported to create the specific contracts for agricultural producers such as landing based on warehouse receipts, designing of the specific credit arrangements that fits farmers needs due to specific cash flow.	3. Greater profitability, 5. Greater financial stability, 6. Enhanced farm / business resilience.
Uncontrolled import of raspberries from Bosnia and Herzegovina, Kosovo, Albania	Market access	Uncontrolled import of raspberries from Bosnia and Herzegovina, Kosovo, Albania and Macedonia, which is of poor quality. It is usually mixed with domestic	Markets, contracts and institutional arrangements.	Market orientation (e.g. developing new markets, differentiation, standards and	Ariljska malina as PDO product, organic raspberry production development etc.	2. Added value, 4. Improved access to markets, 5. Greater financial

and Macedonia		raspberry as traders cannot deliver the contracted quantity. Due to poor quality raspberries are often returned from export.		certification, adding value).		stability.
A very fragmented ownership.	Factor access (land, labour, finance)	Serbian raspberry farms are small, usually organized as a seasonal family business. The average area of the raspberry farms is between 0.5 and 1 ha, making it difficult to take advantage of the economies of scale and production costs are usually high. The farms are poor technology equipped.	Markets, contracts and institutional arrangements.	Contractualisation (e.g. short-, long-term contracts, hedging).	Family farms do not meet the requirements of the Law on Agricultural Land for long-term lease. Therefore, state land that could be used to increase the production of raspberries is simply unused / out of production. It is necessary to change the conditions for leasing the land to 20-30 years so that they can satisfy family farm's needs. Land market institutions: better functioning of Real Estate Cadastre, Law on agricultural land and long term leasing, commassation, inheritance law and agriculture (right of pre-purchase). Farmers' level: Cooperation in the new equipment use between farms at the community level.	1. Increased productivity, 4. Improved access to markets, 5. Greater financial stability.
Great dependence on export companies and the lack of	Market access	Small and medium-sized cold storages work for a few big market players / exporters. The weakest position in the Serbian food	Markets, contracts and institutional arrangements.	Collective arrangements (e.g. cooperatives, producer	Producers' organizations should play a key role in the development of the sector.	4. Improved access to markets, 5. Greater financial

producer organizations.		chain belongs to farmers. They are unorganized, divided and without adequate representation in the various governing bodies. There is a limited number of organizations (cooperatives) that can help farmers to sell their raspberries to wholesalers and processors.		organisations, partnerships, horizontal cooperation, vertical integration).		stability, 8. Strengthened negotiation power.
Unpredictability of price.	Price levels / volatility	Due to the lack of strong institutional arrangements in the production chain, agricultural producers depend on the price determined by cold storages (traders). Producers of raspberries do not have an agreed price for their product. In addition, they are forced to buy inputs for production using unusual contracts - the input price is set, but not the future raspberry price in which they will make the final payment	Markets, contracts and institutional arrangements.	Contractualisation (e.g. short-, long-term contracts, hedging).	Creating the environment for effective and efficient price control: Public warehousing (warehouse receipt model), use of innovative financial instruments - the agricultural commodity derivatives (forward contracting, futures contracting, options on futures etc.).	3. Greater profitability, 5. Greater financial stability.
Very small share of processed raspberry products in export.	Market access	The bulk of the raspberry production is for export. Almost 90% of raspberry production is frozen, while only 10% is used for processing or fresh retail sale. Exports are fairly	Competitiveness, viability and risk management.	Flexibility in production and marketing.	Long term contracting with processors, traders and exporters, Labelling - farms orientation toward PDO/PDI or organic production, Processing - juice industry, frozen fruit industry etc.	4. Improved access to markets, 5. Greater financial stability.

		variable and dependent on several markets (almost 60% of exports go to 2 countries and more than 80% of exports in 6 countries in the World).				
Declining competitiveness in the international market	Technological	The low presence of market-oriented producers is evident, with intensive production and modern technology applied in their practices. It is necessary to innovate and improve technology. Production systems must be significantly improved in the future. Educational programs supported by the government or municipalities in the region of Sumadija and Western Serbia should play a key role. Particular attention should be paid to the implementation of food quality standards.	Competitiveness, viability and risk management.	Technological innovation.	Improvement of food quality standards.	1. Increased productivity, 3. Greater profitability, 4. Improved access to markets.
Unfavourable market structure	Market access	In order to improve the position, farmers who were able to build their own storage capacities did it to control the price during the harvest. Nevertheless, the cost of storage is extremely high (having in mind electricity and other	Competitiveness, viability and risk management.	Flexibility in production and marketing.	Cooperation among small cold storages.	

		payments), and it is uncertain when and under what conditions they will be able to sell frozen raspberries to the large warehouses. Currently, around 250 small cold storages operates in the Arilje municipality, but they are not acting as a group.			
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