

16 Critical factors for risk reduction in the Serbian agri-food sector¹

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Abstract

Climate change and uncertainties related to energy sector in terms of the high degree of globalization of markets can in a relatively short period of time cause a significant change in demand, scope and structure of agricultural production, causing both price volatility and threaten food security. The lack of predictability in the business of agri-food sector is conditioned by the lack of long-term contractual relationship between the food industry and manufacturers of raw materials, as well as lack of market integration, primary agricultural production and industry that the benefits for their input just agricultural products. Accordingly, the article analyses the key risks to which the group is exposed to the agri-food sector in Serbia. It is primarily about: institutional, financial, market, technical and operational risk. In article is shown the risk matrix in which are listed the specific risk events and their potential effects, the probability of the event, as well as the proposal of some of the key measures to overcome them.

Keywords: risks, competition, critical factors, the agri-food sector

JEL Classification: D81, Q12, Q14

16.1. Introduction

To organize business environment for agricultural producers, companies, associations and other interested parties, in fact means, way to organize individual institutions, their relationships on market principles, and all these relations regulate in a consistent system. The condition for this is to organize and functions of the state on a modern way, in terms of stimulating, development-oriented factors of the economy.

It should be noted that the macroeconomic environment is so organized that works in harmonious interaction of individuals and institutions. In this context should function individuals with new rights and obligations, with the new own im-

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age. The same applies for all institutions, which along with the new rules must have individuals and groups with clearly defined roles.

Serbia has great potential in the agricultural sector, which is not fully utilized [Simonović et al., 2012]. With adequate strategic planning and risk reduction, agriculture can make a major contribution to the economic development of the country. This is because of its connections with and influence on other sectors, which is extremely important for the development of Serbia, due to the fact that it employs, directly or indirectly, a large number of people involved in significant work in foreign trade, ensure food security for citizens, contributes to rural development and ecological balance.

Realization of agricultural competitiveness requires from macroeconomic management to change the basic elements of agricultural development strategies, primarily in the direction of creating a sustainable agricultural system, which leads to the growth of knowledge and innovation, as well as in the direction of market development and agricultural chain products. Namely, agricultural production in Serbia insufficiently fulfils the requirements of the market in terms of quality, price, range, delivery of products and organic production standards. Low capacity utilization and the inability to product placement are result of the business philosophy, which is the production of an end in itself, where the ecological aspect of production was relegated to the background. This attitude towards the economy led to higher inventories, which were further maximizing already high production costs [Mihailović, 2007].

At the same time, the necessary business decisions were not made on time; technology, labour and production discipline were not at a satisfactory level. The condition for achieving sustainable development is the introduction of automation, flexible manufacturing system, achieving high-quality products, revitalization funds for the work, which should contribute to reducing the risks in agri-food sector in Serbia.

16.2. Factors having positive and negative impact on the flow of agricultural development in Serbia

Agriculture is one of the pillars of economic development of the Republic of Serbia, and its importance to the national economy, in addition to economic has also and social and environmental component. The main characteristic of changes in the agrarian structure of Serbia during the transition is that they take place between the conversion of state / public property into private (investors bought large estates with infrastructure, equipment and facilities), while the turnover of land between private owners was not significant (private property was not subject to major transactions involving large, external capital accumulated outside agriculture).

At this point we will give an overview of the basic parameters that have decisive influence or which in the future could affect the flows (both positive and negative) of agricultural development in the Republic of Serbia. The following lists represent the most important factors of positive impact on flows of agricultural development:

1. *Favourable natural resources (location, soil)*. The Republic of Serbia has favourable natural conditions for the development of a variety of agricultural production, because it is located in the most suitable area of north latitude. Along with climate, soil is the most important natural condition for the development and arrangement of agriculture. According to the Statistical Office of Serbia agricultural land makes 65.6% of the territory of Serbia [Republic Statistical Office, 2013]. The Republic of Serbia possesses 5,346,597 ha of land (agricultural, forest, other land), or 3,437,423 ha of utilized agricultural land (0.48 ha utilized agricultural land per capita) [Republic Statistical Office, 2012]. Even 73% of utilized agricultural land makes arable land and gardens (more precisely 2,513,154 hectares).
2. The Republic of Serbia possesses sufficient quantities of water to meet their needs, but only if it is used on rational way and protected against possible accidental or deliberate pollution. Significant wealth represents mineral and thermal mineral water, whose variety of physical and chemical characteristics put in order of the places with the richest areas in the European continent. From all available water less than 8% originated from national territory, while the remaining 92% of the transit of water. In such conditions cooperation with countries in the Danube basin receives great importance, as well as developing regional cooperation in the field of management of water resources [Mihailović et al., 2014b].
3. Numerous free trade agreements (especially the CEFTA agreement, preferential exports to the EU market, free trade agreement with the Russian Federation, the General System of Preferences with the United States), the Republic of Serbia has created favourable conditions for foreign trade in goods in the field of agri-food sector. These agreements provide a chance to domestic producers and exporters to the market several times larger than the domestic, overcome the problem of small markets and to increase capacity utilization, with the exercise price competitiveness and increase product quality.
4. Certain number of companies is located at the top of the technical equipment and has highly educated personnel, while other companies are lagging behind the modern technological and marketing requirements. Since the beginning of privatization process, most of investment are recognized in the oil industry, beer, milk, confectionery products and in industrial water treatment, on

the other hand less investment and less technological equipment are recognized in the industry for the processing of sugar, meat, fruits and vegetables.

Factors of negative impact on the flow of agricultural development:

1. As a result of the uncontrolled use of chemicals most of the arable soil is acidic and in Vojvodina is salted. Consequently, there exist need for implementation of agrotechnical measures in order to improve soil structure – calcification, greater use of organic fertilizers etc.
2. Water regime, although it is favourable but is not sufficiently utilized. River flows are little use for irrigation. Irrigated areas on farms of agricultural holdings (family farms, legal entities and entrepreneurs) covered 99,773 ha, which represent 2.9% of using agricultural plots [Agriculture Census, 2012]. Consequently, agricultural production depends on rainfall, which are, depending on atmospheric processes and relief characteristics – unevenly distributed in time and space.
3. The ownership structure of agricultural land makes small and fragmented agricultural holding (used agricultural land per farm amounts to 5.44 ha) [Agriculture Census, 2012].
4. There is a relatively low capacity utilization of the food industry.
5. The basic limiting factors for greater and more effective involvement of the food industry in the international market are the following: insufficient range of food products in relation to the offer in the developed world; fluctuations in market quality products, either due to lack of standards, either because of non-compliance and poor control of applicable standards; lack of long-term and solid contractual relations or proprietary connection between the food industry and primary agricultural production;
6. Trade liberalization and the reduction of tariff protection (in the framework of the WTO and the Stabilization and Association Agreement);
7. Low competitiveness and innovation of agricultural producers in Serbia. It is necessary to involve small-scale producers in modern market chain, because they are not sufficiently competitive, traded in the informal channels, and their cost of implementation of the standard is high.
8. Areas of primary agriculture and food industry for greater investment are not attractive. Reasons are: institutions are not still developed; institution of negative/non-stimulating business environment; high investment and political risk; high capital costs; the presence of a large number of cost; and many other factors.
9. Changes in customers' behaviour, in their demand or habits and cause changes in the functioning of market chains. It is expected that when the ongoing global crisis these changes are even more pronounced [USAID, 2009].

16.3. Institutional risks in the agri-food sector in Serbia

There are different perceptions of risk. Primarily, it should be known the main factor of risk insurance, something without insurance could not exist. The risk could be defined as the threat of occurrence of economic or social damage events that include insurer obligation to pay damage or payment of the sum insured in accordance with the terms of insurance [Petrevska et al. 2010]. Table 1 shows the risk matrix in the agri-food sector in the Republic of Serbia. Below are analysed institutional risks that affect just the performance of the agri-food sector in Serbia.

1) Unpredictable agricultural policy. One of the main characteristics of agricultural policy in the past is its unpredictability. Inconsistency in the formulation and implementation of agricultural policy in the past has caused many consequences, such as: (1) reduction of investment and productivity in the agricultural sector; (2) non-market spillovers profit between economic actors in the supply chain; (3) the slow adjustment of food safety standards.

Measures to overcome the risks. In the coming period are evident need to adopt new laws and by-laws and regulations in the field of agriculture, the application of existing laws, as well as for the further development of an institutional framework, primarily through reform the Directorate for Commodity Reserves, through the establishment of appropriate laboratory and inspection organizations (in accordance with EU standards), through reforming the system of advising, supporting institutions, etc. Institutional support to the country (administrative simplification) is necessary and in the field to facilitate and expedite the construction of the necessary infrastructure for agriculture.

2) Insufficient use of the program to support rural development. The programs to support rural development can have significant effects if they are aimed to increase the competitiveness and innovation of agricultural production, increase employment in rural areas, improvement of the environment and quality of life in rural areas.

Measures to overcome the risks. Rural social capital and stimulation of the involvement of citizens in decision-making processes at the local level – must be encouraged more information and educating the rural population about their role and importance in the process of creating public-private partnerships, local action groups (LAG) and the like. Especially important is good cooperation of the population / stakeholders with local authorities on issues of rural development and agriculture, as well as with non-governmental sector in joint implementation of various activities. Integrative approaches to local development are very useful, especially in terms of building local capacity and help

government agencies and Ministry of Agriculture and Environmental Protection of the Republic of Serbia in the direction and control of state aid / support.

3) Insufficient development of institutional support and the legislative framework. Insufficient development of institutional support and the legislative framework is reflected in non-reformed Directorate for Commodity Reserves, Advisory services and water management organizations which still operate as state-owned enterprises. Actual situation is aggravated because it is not implemented the reform of scientific institutions supporting agriculture. On the other hand, chambers of commerce, cooperative unions and professional organizations, due to the reluctance to carry out internal reforms, still do not represent the holders of agricultural development. However, in this period was formed several major state institutions: the General Inspectorate for the Veterinary Administration; plant protection; water; forests; land; agricultural payments; established a Register of agricultural holdings.

Measures to overcome the risks. In order to approach extension service needs of agriculture it is necessary to decentralize and networking consulting work. Support for these process should be decentralization of the advisory bodies of individual ministries, which would create conditions for more adequate answers to the needs of individual farms and agricultural enterprises, and the possibility of a partnership approach to solving business problems. Also, in order to allocate resources efficiently, requires regional exchanges of consultants, including networking consulting work. Agricultural companies and manufacturers are insufficiently informed about the role and importance of counselling services and the education of people, in this sense, is not enough.

4) Undeveloped business infrastructure. Building integrated business infrastructure in order to stimulate investment activity, attracting foreign and domestic investment and increase employment.

Measures to overcome the risks. Industrial zones and parks are successful and efficient mechanisms for the promotion of industrial development. Projects balanced development of business infrastructure to consolidate resources in terms of business infrastructure so that they are balanced and do not compete with each other, but, rather, supplemented by offering facilities that are complementary with other industrial logistics centres.

Table 1. Risk matrix in the agri-food sector in Serbia

Institutional risks		
Risks	Influence	Measures to overcome risks
Unpredictable agricultural policy	- Impact assessment: average - Probability: medium	New laws and by-laws and regulations in the field of agriculture.
Insufficient utilization of support program for rural development	- Impact Assessment: High - Probability: Medium	Rural social capital and stimulating involvement of citizens in decision-making processes at the local level.
Insufficient development of institutional support and legislative framework	- Impact assessment: average - Probability: medium	In order to approach extension service to requirements of agriculture, it is necessary to decentralize and networking advisory work.
Undeveloped business infrastructure	- Impact assessment: average - Probability: medium	Industrial zones and parks are successful and efficient mechanisms for the promotion of industrial development.
Financial risks		
Risks	Influence	Measures to overcome risks
Rural poverty	- <i>Impact assessment: average</i> - <i>Probability: medium</i>	The active role of the state in terms of adoption and application of the law; direct financial support, advice and logistic role of the state.
Unfavourable long-term loans for the purchase of new agricultural machinery and equipment	- Impact Assessment: High - Probability: Medium	Collecting of documents of the applicant and its processing etc.
Unfavourable short-term loans for export financing	- Impact Assessment: High - Probability: Medium	Approval of loans for financing working capital for production and exports of goods and services of domestic origin.
Investment risk	- <i>Impact assessment: average</i> - <i>Probability: medium</i>	Reducing investment risk through diversification of funding sources.
The global financial crisis	- Impact Assessment: High - Probability: Medium	To encourage the development of new processing capacity according to available strategic raw materials and market requirements etc.
Market risks		
Risks	Influence	Measures to overcome risks
Insufficient quality of the labour force in the rural labour market	- <i>Impact assessment: average</i> - <i>Probability: medium</i>	Improving knowledge and skills of the population in rural areas.
Delayed restructuring of agricultural companies	- Impact assessment: average - The probability: high	Restructuring of agricultural enterprises must be made in the direction of the end of the process of ownership restructuring, and then the market etc.

Table 1 (cont.)

Low utilization of processing capacities	– <i>Impact assessment: average</i> – <i>Probability: medium</i>	Expanding the assortment of food products, standardize the quality of products and others.
Changes in customer requirements	– Impact Assessment: High – Probability: Medium	The development of the food industry that is focused on meeting the needs and desires of consumers, with an emphasis on innovation, quality and the like.
Lack of modern market chains	– Impact Assessment: High – Probability: Medium	It is necessary to involve small-scale producers in modern market chain, enhance competitiveness at the level of processing facilities.
Technical risks		
Risks	Influence	Measures to overcome risks
Technical and technological backwardness of agriculture	– Impact Assessment: High – Probability: Medium	Investments in the modernization of agriculture, which would contribute to its greater competitiveness on the world market.
Environmental pollution	– <i>Impact assessment: average</i> – <i>Probability: medium</i>	It is necessary to pass to the technology in agricultural production that are friendly to the environment etc.
Production risks		
Risks	Influence	Measures to overcome risks
Floods and droughts	– <i>Impact Assessment: High</i> – <i>Probability: High</i>	The introduction of irrigation systems and drainage systems.
Hail (storm) and frost	– <i>Impact Assessment: High</i> – <i>Probability: Medium</i>	Modernization of the anti-hail protection and development of varieties tolerant to adverse climatic conditions.
Pests in the form of plant and animal diseases	– <i>Impact assessment: average</i> – <i>Probability: medium</i>	The development of varieties tolerant to diseases and pests

Source: authors' estimate.

16.4. Financial risks

Most people are risk averse, which can be interpreted so that people do not like bad things, but they love the good things, and this is a behavior that is characterized by an aversion to uncertainty [Latham and White, 1994]. Unfortunately, financing of agricultural production in Serbia, as its yields and associated high financial risks.

1) Rural poverty. Serbian rural areas cover 85% of territory, with 55% of the population, and form 41% of the country's GDP [Bogdanov, 2007]. Poverty of rural areas is closely linked to great dependency rural economy from agriculture. From the point of poverty, especially the vulnerable categories of farms small and medium size (the farm holdings which have 5 ha), which deals only in

agriculture, but this category is the most numerous. These households are exposed to high income and market risk due to: the growing competition in the domestic and foreign markets; small taking a loan and investment; reduced job opportunities outside of agriculture; the devastation of the area and the lack of institutional support. Also, the socially vulnerable category includes elderly people and pensioners, women, youth, internally displaced persons.

Measures to overcome the risks. Although the association of farmers can reduce the high rural poverty, and improve the productivity and competitiveness of farmers, without the active role of the state in terms of adoption and application of the law (which regulate the field of primary agricultural production, trade, credit, financing, merger), and without direct financial support and advisory and logistical role of the state – It cannot be expected positive effects of the merger.

2) Adverse long-term loans for the purchase of new agricultural machinery and equipment. Creating conditions for easier access to credit lines to banks under more favourable conditions than the market, farmers who are holders of registered family farms acquired a new agricultural machinery and equipment.

Measures to overcome the risks. Informing potential beneficiaries through:

- Presentation for associations of agricultural producers;
- Delivery of promotional material of local economic development to local administrations;
- Promoting vacancy in professional journals;
- The collection of documents of the applicant and its processing.

3) The unfavourable short-term loans to finance exports. Ensuring financial assets to support the preparation and implementation of export programs, employment, increase exports, increase profitability, increase competitiveness.

Measures to overcome the risks. Approval of loans to finance working capital for production and exports of goods and services of domestic origin, with a repayment period of up to 180 days, and in accordance with the terms of the individual competition.

4) Investment risk. For example, investments in infrastructure and irrigation equipment are significant, in some cases, per unit of area is the very high, and it is necessary to orientate towards a market economy and competitiveness of agricultural production. For irrigation is necessary to choose the very income plant, which can pay off expensive irrigation practices. Drip irrigation system (“drop by drop”) is only suitable for very intensive and income plant species, which cannot pay the high costs of construction, operation and maintenance of this system.

Measures to overcome the risks. Reducing investment risk can be achieved through diversification of funding sources. For example, the sources of funding for the construction of an integrated water supply system of Srem areas can be, among other things:²

- The assets obtained from the Development Fund of Abu Dhabi (the funds are intended for irrigation projects);
- Potential loan assets from the Kuwait Development Fund, the Development Fund Emirates, etc.;
- Donor/credit funds and funds of the European Union.

Loan funds of international financial institutions, such as: the World Bank, International Bank for Reconstruction and Development (IBRD), International Finance Corporation (IFC), European Investment Bank (EIB), European Bank for Reconstruction and Development (EBRD).

5) The global financial crisis. Lack of investment capital will cause adverse trends in the agricultural sector in Serbia, which is sublimated can be summarized as follows: reduced predictability of business due to the difficulty in maintaining macroeconomic stability; increasing the cost of capital; dinar depreciation increases the purchase price of the agricultural production inputs and deteriorating creditworthiness of farmers; reduced purchasing power of the population affected by the decline in demand; insufficient funds at EU and national level can lead to an increase in the tax burden, but also the abolition or reduction of agricultural subsidies.

Measures to overcome the risks. In such circumstances, increase the pressures of foreign producers to sell products on the Serbian market, while it is difficult placement of Serbian goods abroad, and this raises the issue of lack of competitiveness of Serbian agriculture. Accordingly, it is necessary to:

- improve the marketing activities for agricultural and food products in order to gain new markets or return to some of our traditional markets;
- support the development of brands in the food industry;
- encourage the development of new processing facilities available to strategic raw materials and market demands;
- encourage and support investments towards increasing the number of small and medium enterprises with a market propulsive export programs and production.

² Previous feasibility study of the general project of the regional water supply system Srem with previous feasibility study, Belgrade Banking Academy, to the Institute of Economic Sciences, Institute of Agricultural Economics, Konzit, Belgrade, 2014.

16.5. Market risks

In order to reduce risk and uncertainty in the agri-food sector in Serbia, it is necessary to have adequate information about the changes which happens in the environment, especially in the market. Market risk cannot be eliminated, but through market research it can be significantly realize reduced [Mihailović, 2007]. There are many agricultural companies in Serbia which are considered to have fully mastered the business and to know the market. However, a growing number of enterprises, agricultural producers and agricultural associations engaged consulting companies, marketing agencies, institutes and other independent advisors to solve business problems. The main market risks in the agri-food sector of Serbia are given below.

1) Insufficient quality of the labour force in the rural labour market.

The quality of the workforce is one of the limiting factors of economic development in rural areas, because investors “bypass” the city that does not offer high-quality and skilled workforce. On the other hand, more educated populations are difficult to retain in rural areas with no attractive economic environment and jobs appropriate for their specific needs and preferences.

Measures to overcome the risks. Improving knowledge and skills of the population in rural areas (knowledge of economics, marketing, management, information technology and use of the Internet, etc.) is a very important factor, as for agricultural production and for diversification of activities in non-agricultural sectors.

2) Delayed restructuring agricultural enterprises. The complex business systems in Serbian agriculture provide greater production, the application of scientific solutions, and technical and technological inventions. These systems have a larger number of organizational units, which are characterized by a relatively large extent autonomous business decisions. In doing so, these systems are composed of a number of specific economic entities, companies that have special legal and economic status.

Measures to overcome the risks. Restructuring in our conditions, shall cover all areas of functioning of agricultural enterprises and the result is a delayed reaction and adaptation to changes. Restructuring of agricultural enterprises must be made in the direction of:

- completion process of the ownership restructuring and privatization of agricultural enterprises;
- market restructuring which represents a redefinition of the market in which the company performs with the aim to improve sales and business operations;
- organizational restructuring and changes in the organizational model and the concept of enterprise operation;

- business restructuring that should result in significant changes in the affairs of the agricultural company;
- financial restructuring that involves a change in the capital structure of the company, which is changing the relationship between ownership and debt.

3) Low utilization of processing capacities. There is a relatively low capacity utilization of the food industry (capacity utilization, which are designed for the market of the former Yugoslavia, ranges from 30% to 50%). The highest level of use there is at capacity for the production of mineral water, oil refineries, mills, capacity for fruit and vegetables, confectionery products, breweries, dairy and sugar refineries. The lowest level of use is the capacity for processing animal feed and slaughter houses, causing inefficiencies in operations and weak competitiveness of the sector.

Measures to overcome the risks. Factors for greater and more effective involvement of the food industry in the international market, thereby increasing capacity utilization, are the following: (a) expanding the assortment of food products in relation to the offer in the developed world (not wide enough range of existing products, a small number of the introduction of a completely new products or improving existing products and processes, is a small degree of added value products through increasing role of knowledge, innovation, etc.); (b) standardization of product quality; (c) entering into long-term and solid contractual relations or proprietary connection between the food industry and manufacturers of raw materials (primary agricultural production).

4) Changes in customer requirements. Changes in customer requirements, their demand or habits and cause changes in the functioning of market chains. It is expected that under the ongoing global crisis, these changes are even more pronounced. Due to decreased demand in some markets, manufacturers must adapt its production to new requirements, traders need to find new markets and adapt to the new conditions of sale with a delay in payment, or to find a new point of sale or new sources of funding. In such circumstances, the goal is to reach marketing strategy to capitalize on the benefits on the basis of scale, synergies and external flexibility [Kotler, 2003].

Measures to overcome the risks. In the following period emphasis must be placed on the development of the food industry that is focused on meeting the needs and desires of consumers, with an emphasis on innovation, quality, high level of food hygiene and food safety standards. Development policy of the food industry must follow global economic trends (such as the concentration capacity and capital, the introduction of highly sophisticated technology), and in this process the role of the state is important, both from the standpoint of security and protection of competition and control of abuse of monopoly position, and from

the aspect of fiscal and investment support, especially small and medium processing capacities in the rural areas of the country.

5) Lack of modern market chains. The modern market chains in Serbia are not still built in appropriate way. In the area of primary production, there is present a high level of competition, while at the processing level is present small competition as a result of an unattractive area for investment because of undeveloped institutions; failure to fulfil a EU export standards for a large group of products; as well as unfamiliarity of real competitiveness due to high tariff protection [Cvijanović et al., 2009].

Measures to overcome the risks. It is necessary to involve small-scale producers in modern market chain, because they are not sufficiently competitive, traded in the informal channels, and their cost of implementation of the standard is high. Also, it is necessary to improve competitiveness at the level of processing capacity, which would thus find new markets and increase consumption. Due to decreased demand in some markets, producers must adapt its production to new requirements, traders need to find new markets and adapt to the new conditions of sale with a delay in payment, or to find a new point of sale or new sources of funding.

16.6. Technical risks

On the basis of the surveyed 154 companies (small, medium and large enterprises) in the whole of Serbia, the data indicate that in the food industry, the average age of machinery and equipment is 27.17 years.³ In central Serbia, the average age of machinery and equipment in the food industry is also about 27 years. It is clear that without modern machinery goods produced in Serbia cannot reach high quality standards and be competitive on foreign markets.⁴

1) Technical and technological backwardness of agriculture. Constant technical and technological improvement of agriculture often supports the need for labour in many segments of the national industry; the results of agricultural production can be significantly enlarged with relatively small amounts of additional capital invested; Given that requires a relatively small investment, agricultural development can represent significant savings of human capital.

Measures to overcome the risks. Having regard to the obsolescence of the equipment used and technology solutions, or lack of equipment in primary agriculture (here are understood and irrigation systems), there is a need for significant capital investments in the modernization of agriculture, which would contribute to its greater competitiveness on the world market (especially the EU

³ The Union of Employers of Serbia, 2010, p. 4.

⁴ The Union of Employers of Serbia, 2010, p. 5.

market). It should be noted that the introduction of modern technology and production solutions in agricultural practices requires usually large and financially strong (commercial) farms.

2) Environmental pollution. One of the conditions for the sustainable use of resources is the monitoring of the environment and this can be achieved through the establishment of appropriate inspection services whose professional staff will be able to perform quality control of land and water resources. Coordinated actions of all services that are related to agriculture, starting from the national to the local level, it is possible to reduce the level of pollution originating from agriculture. In this way the state of the environment would improve in areas that are involved in agriculture which would result in the production of healthier and safer food.

Measures to overcome the risks. In agricultural production it is necessary to transform on technology that are friendly to the environment. Also, through forming services for monitoring the condition of land and water resources gained to access to a quality of land / water. This service, in cooperation with other professional services on local or city level have a detailed insight into the quality of soil and water in the territory of their municipality and its order accordingly unable to plan all activities related to the further use of soil / water. Also, data service that could serve as a centre for informing the local population and all stakeholders on the environmental situation of the municipality in which they live.

16.7. Production risks

Agricultural production depends on biological processes affected by weather conditions, soil fertility, pests, diseases, etc. Consequently, in agricultural production in Serbia “uncertainty is the only certainty”. Production risk is significantly linked to agricultural production, in contrast to the production processes which are technologically determined and almost always create identical products. The entropy of the system in this production is the minimum and maximum predictability. In agricultural production is vice versa, because agriculture is under the influence of unfavourable factors that are very difficult to be controlled or avoided. It's about the bad weather, such as insufficient or too rich rainfall, hail (storm), cold, extreme low or high temperatures, pests in the form of plant and animal diseases, etc.

Measures to overcome the risk. The introduction systems for irrigation and drainage, modernization of anti-hail (storm) protection, the development of varieties plant tolerant to adverse climatic conditions, as well as the development of varieties plants tolerant to diseases and pests.

16.8. Networking scientific-research and consulting activities in the function of minimizing risk in agriculture

In economic theory, but in contemporary practice, it is well known: if the total capital, as production potential, conditionally divide to natural (K_p) and manmade – physical and intellectual (K_h); it is necessary that the total stock of capital ($K_p + K_h$) not decline during doglednog time [Milanović et al., 2008]. The obvious prerequisite for this is to ensure a certain degree of substitution between different forms of capital, i.e. inevitably reduce natural capital is replaced by increasing the available human, and primarily intellectual capital. It is, therefore, only achieved by increasing the application of already acquired and new knowledge and the best of modern manufacturing practices, i.e. the use of resources overall scientific and technical and cultural potential.

A substantial contribution to the major role in meeting this important conditions precisely belongs to science, art, or the appropriate network institute that would provide the necessary support to enterprises in the management of the transformation process. Over time, the institutes in Serbia have adjusted their activities and went to meet the needs of the economy.

According to some estimates, in the financing of research projects in Serbia the state accounts for 70% and the private sector with 30%; In developed countries the situation is inverse: the country accounts for 30% and the private sector with 70%. In such circumstances it is necessary to stimulate meaningful partnership between the public and private sectors, primarily in the form of: 1) intrasectoral mobility of researchers; 2) intersectoral mobility of researchers. Namely, in solving business problems interdisciplinary approach is necessary, as they often occur unstructured business problems for which they cannot apply simple solutions. Also, the results of empirical research show that it is necessary to do two things: a) decentralization of consulting work, and b) networking of research organizations.

Analysis of demand for consulting services in agro-complex indicates that the most engaging are private consulting organizations (70%), and scientific research organizations (20%) [Mihailović, 2011]. The most important criteria for the selection of consultants are business integrity and professional competence [Mihailović et al., 2014a]. The offer consultancy services of research organizations can be based on contingent approach, with maximum adaptation to market requirements. The selection of consulting services that would be the focus of business deals institutes in Serbia can be customized aspects of which are given below.

- The results of empirical research show that in the area of operational management in companies of agro-complex greatest demand in the area: production consulting, standardization of production and creation of business plans;

in the field of corporate strategy significantly the share of marketing research and strategic planning [Mihailović, 2011]. Accordingly, it could be enforced short-term adjustment of consulting business offers services with special attention would be given to consulting in the implementation of certain standards in production.

- Long term adjustment would be made in accordance with the experience of some countries that have had at the stage of EU accession and after accession phase. Past experience indicates that certain sectors are potential winners after joining the EU. Potential winners are: tourism, transport, construction, financial services and consulting services in the field of environmental protection. Traditional manufacturing industry is essential modernization and introduction to marketing logic. Consulting services connected with ecology and environment requirements are relatively new issue, but it is believed that in the future this segment of the market of consulting services will have a greater significance. In support of this conclusion is the fact that this sector is stronger in many countries that have joined the EU. What is certain is that these services are interdisciplinary.
- Development of consultancy services in the field of environmental protection is under the influence of Serbia's accession to the European Union. The EU market accounts for about 500 million customers. Accessing this market imposes harsher operating conditions that are reflected in tougher competition and a number of regulations in the field of environmental protection, protection of producers and consumers, etc., and it is inevitably to adapt to these trends.
- In line with this business environment, and bearing in mind the current business of institutes in Serbia, it would be useful to require specific organizational and personnel adjustment: eventually formation a sector of consulting; training of individual employees for the introduction of certain standards in production, in order to have certified researchers and consultants in this field; stimulating networking with other scientific research organizations and private consultancies.
- In the field of environmental management, there are at least three types of consulting projects that may be included in the job offer: (1) diagnosis of the environmental conditions, corporate social responsibility and sustainable development; (2) education and implementation of standards for organic production; (3) interrupting production and technology. The offer of consulting organization depends on the needs, i.e. market demand for consulting services. At the same time, the offer is conditional on human potential of consulting organizations. The most important are the experience and expertise

of consultants who make it possible to meet the demands of clients on the issue of environmental management.

- At the same time, it is important to emphasize the necessity of increasing specialization of consultants for specific areas. Specifically, in order to meet the standards of organic production, it is necessary that consultants have a new highly specialized knowledge. Ideal for consultants (the so-called CMC – “Subject Matter Specialist”) involves knowledge of specific areas such as socio-economic consulting, environmental consulting, as well as the introduction of new regulations and standards in the EU. Consequently, the assumption of a successful consulting includes the continuing education consultants and exchange business experience and innovation through consulting associations.

16.9. Associating of farmers as a response to increased risks in the agri-food sector in Serbia

Associating or through modern terminology speaking networking, is being widely spread in the world trend. The aim of association is a synergy that contributes to the networked actors better use of individual performance in the market. Global business networking has become a contemporary strategic need, a new model of entrepreneurial behaviour and global megatrend, which is just based on the search key competence of the company and the efficiency of organizational and procedural networks, and consists in creating a flexible, synergistic and competitive organizational structure [Drasković, 2004].

The key objective of the network business connections consists in the realization of its useful economic and organizational effects (direct and indirect). It is in the literature explains over its fundamental principles of formation and functional specifics of existence, which is reflected in the dynamic tendency of organizational development, continuous expansion and development in order to achieve better positioning and greater success in the market.

Practice has shown that through networking organizational structure, business processes, scientific research and so on, comes to the key knowledge, skills and other benefits that are on the market valorised as competitive. Networked partners in business processes is increasingly common use their core competencies in order to faster, cheaper, more flexible, better quality and greater results, which creates a competitive advantage in the global marketplace. Accordingly, below are some models of networking contributing to the spread of innovation and risk reduction in the agri-food sector in Serbia.

The formation of cooperatives of agricultural producers in the principles of modern cooperatives, creates the necessary conditions to achieve satisfactory production and economic results. This concept can be applied to the formation

of an entire production chain, from primary production, through obtaining a number of semi-finished products, to the highest level of finalization. Cooperatives of agricultural producers, built on the principles of modern cooperatives, can be seen as a business system – company, with all of its business functions, which would be implemented through a service or employees of relevant specialists. Producers would enter subject of works, tools and their own labour; on the other hand cooperatives would provide all other services which are necessary for successful functioning of production: commercial – procurement of raw materials, product sales, marketing; financial – the provision of loans for fixed assets, the provision of loans for working capital; accounting – keeping accounting records for the farm; logistics – warehousing, transportation, distribution.

From the standpoint of available resources, organization, technology and management, it is assumed that the cooperative is much functional in relation to family farms. From the above mentioned reasons, observation of cooperatives of agricultural producers with this aspect would be significant, both in the theoretical and in practical terms for planning and organization in a variety of conditions making. For example, the organizational model of cooperatives of agricultural producers should be designed so that producers did not transport fruit to the buying centres, but it submitted them directly from the plot. This concept requires finding the optimal program transport fruit, with clearly defined levels, from a number of starting places to destination. The final destination may be controlled, some processing facilities or shopping centres. Number of starting places will depend on the number of fruit producers who are members of cooperatives, as well as the number and location of their plantations. By the optimal program of transport, which will enable the efficient transport and distribution of products, with the rational use of means of transport and the lowest transportation costs, could be reached by the methods of linear programming [Dimitrijević et al., 2006].

Clusters can be defined as a critical mass of companies and institutions in one place, an unusual competitive success in certain fields [Porter, 1998]. According to Porter, a strong competitive advantage in the global economy lie mainly in local things – knowledge, relationships, motivation – differences that competitors cannot easily copy, which can best be developed through clusters [Porter, 1998]. Cluster associating characterized by cooperation and connections (unification and complementarity) of members, their geographical or local limiting, active channels for business transactions and communications, creation of joint products and/or services or joint resolution of some need or objective.

The main factors in development of clusters should be companies which participate in them. Only through their active participation, the cluster will strengthen and develop. Educational institutions also play a role, and in some cas-

es have proven to be an important catalyst in the development of clusters. Colleges can have an educational role, but can also be the key factors in research and development and innovation in the single clusters. Also, part of the cluster represent organizations for provision of business services with expertise who can be responding for needs of clusters such as marketing, consulting, etc. organizations. All these bodies can contribute to the strengthening and development of a cluster can have a legitimate role in its development. Finally, local authorities, regional development agencies and other corporate bodies have a significant role in the promotion of cluster development through interventions, strategic guidance, grants, creation of favourable conditions for the development, organization of seminars in the regions, reducing the risk of entering the job or when taking loans, etc. In most cases, clustering along the line of “bottom-up” leads to the so-called quasi clusters, namely associations, which in the future have a perspective to become clusters. Worth highlighting the following “clusters”, namely associations, formed at the initiative of members, not for obtaining state subsidies, but to companies within the cluster strengthen its position in the market [Mihailović et al., 2007]: Association of Fruitland, Cluster of farmers in Kraljevo, “Rakovica agriculture cluster”, Begečka Vegetable Association.

Business incubators are instruments of local economic development to support the newly established small businesses in the early years of their growth and development when they are most vulnerable [Danilović Grković, 2005]. Namely, in the initial stage of the creation of new small businesses they minimize the ignorance and lack of experience in management, accounting, market knowledge and conducting business; these functions are integrated through a common hosting service and occasionally consultants provide such activities for all companies in the hall – incubator of new enterprises. According to the same source, the most important services they provide facilities for incubation include organized access to expertise, experiences, advisory services, advice and mentoring in key business networks and groups is also an important element of these capacities. Offer of physical premises and these services to entrepreneurs increases the likelihood of success of the company in relation to the company that operates independently: research at EU level shows that the mortality rate (in the first five years of operation) of companies that have their business started in the business incubator is less than 15%, unlike other companies, where it is known that the mortality rate as high as 50%. The incubator operates as a capacity in which companies enter and exit, or stay in the incubator companies is limited (usually 3 years).

Contracting community farmers – it usually combine several farmers (4-5), inside or outside the cooperatives to their farms to be able to rationally make use of agricultural machinery. However, in Serbia to this contractual community should

be much higher by the farmer, should go to the exploitation of more powerful tractors and corresponding machine, but in the present size of our family farms. In addition, when joining larger farms, can be used more powerful tractors within each individual farms, because the plots have sufficient size (5-10 ha). With that in mind, here should be to seek appropriate solutions through a special performance for land consolidation. In addition to the grouping of land ownership, land consolidation should be characterized by the same grouping of land utilization methods. Joining farmers to monitor association plots. By combining farmers makes it easier to perform tasks with the help of machines and reduce the costs of production, because the machines fully exploit the larger surface area of associated farmers.

Contracting Community of Fruit Growers, winegrowers and other users for the time being. These communities usually formed cooperative or producers outside the cooperative, which in certain favourable locations have their own plots, and are willing to switch to the advantages of large (plantation) production [Mirić, 1994]. Plant was erected on the land of farmers as a single territory, regardless of the limits of individual parcels of farmers, which may or may not be marked, to indicate ownership of individuals. All activities and in raising and later in the exploitation, which can run mechanized, are performed in the plantation regardless of the limits of individual parcels. All handicrafts conducted individual on his land, or even better in his or her lines, that are defined distribution in proportion to the entered land. In distribution of the resulting product jointly participate according to involved work. The transition to a modern organized production break free members of cooperatives of many heavy handicrafts, while the secured placement of raw materials. Also, materials other than the production can still participate in the processing. Manufacturing Cooperative achieved thanks to these communities best supply sufficient quantities of raw materials required quality, with appropriate time-sharing and low-cost procurement and transportation.

The contracting community of livestock breeders – farmers can come together to jointly produce milk. Herd is size that can provides efficient operations. Such contractual community milk producers have significant advantages over the tendency with us to form a mini-farm in terms of small family farms. Instead of 3 cow house for a dozen cows, it's cheaper to raise a barn with 28-30 cows. Also, instead of three rooms with devices for cooling milk, raises one with better mechanized devices. In our case, each producer must every day perform tasks in the barn, which deters many to devote to the job. Without stating the other rationality in cow houses with larger capacity, in which members of the business community contracting milk producers can easily understand the advantage of contracting communities. It is natural that the community can be educated herders and livestock production lines in others [Mirić, 1994].

Associating according to the model of machinery rings – machinery rings are a special form of organization of farmers in countries with developed agriculture (mainly in Western Europe and Japan). The basic idea is to use the most rational and most productive agricultural machine. Such an approach to the problem of soil cultivation led to the separation of farmers in two basic categories. Those who receive the service and those who provide these services. Such division came to the service providers who are highly specialized only for specific operations, so that the quality of services at the highest level. In addition, the maximum exploitation of mechanization, so the price of the services provided is lower. On the other hand recipients can devote to other problems in its agricultural production (inputs, product placement) and not be burdened with their “unused” equipment. Taking into account the fragmentation of holdings in Serbia, as well as the dispersion of the necessary equipment and machinery, creating mechanical earrings would be achieved more efficient production due to more rational use of existing resources, where to simultaneously fulfil the economies of scale. In such conditions, the cooperative should be in their future work primarily oriented to the work related to the cooperative members. It is necessary for their activities in the future based on respect for the cooperative principles. Also, unions must be organizational restructure, expand membership, to formalize relations between the relevant normative acts and ensure their consistent implementation.

It is necessary that cooperative associations and cooperative unions, trains for cooperative revision to know-how to successfully sanction of previous and protect future negative phenomena such as for example, that only employees could be member of cooperative and that they only have right to managing with cooperative association; that the sale of property of the cooperative; that no procedure of the law on cooperatives, etc. On that way co-operative association could become organization of employee in truth sense of the word.

16.10. Conclusions

Reducing risks in the agri-food sector in Serbia can be achieved through networking of economic actors and ensuring a stimulating business environment, primarily through measures of agricultural and macroeconomic policy. In fact, with appropriate policies, which can cause an increase in productivity, agriculture of Serbia can build competitiveness and make a significant contribution to the economic development of the country.

Although in the field of systemic reforms have been lot done in the future is a key role of the state in creating a favourable and stimulating macroeconomic and business environment, which is the only basis for stimulating agricultural

policy, aimed at restructuring, market development and increase investment in the agricultural sector of Serbia.

Regulated state, developed market, financial, institutional and infra-structural base, is clear legislation and their effective implementation – today are the first and main preconditions to economic entities to compete in the market. In order to achieve the competitiveness of agriculture macroeconomic management must change the basic elements of agricultural development strategies, primarily in the direction of creating a sustainable agricultural system, whose growth leads innovation and knowledge, as well as in the direction of market development and agricultural chain products.

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