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STRATEGIC PLANNING OF SUSTAINABLE DEVELOPMENT OF AGRICULTURE OF LAJKOVAC MUNICIPALITY

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ABSTRACT

The paper explores the agricultural potential of the municipality for Lajkovac and accordingly defines the development priorities and strategic measures of sustainable development in this area. The purpose of the research is to examine the real possibilities for the development of agriculture and rural areas of the Municipality. Consequently, the analysis focuses on: the structure of the economy of the Municipality, the importance and role of agriculture and agro-industry in the municipal economy and the development priorities and strategic measures in the agriculture of the municipality. The research's results show that the Municipality of Lajkovac has favorable factor conditions for the development of agriculture. With regard to the development of Lajkovac agriculture in the coming period, it will be important to develop the processing sector, that is, capacity building, especially in the small and medium enterprises in agriculture (SMEA) sector, in the field of processing meat, milk, fruit and vegetables.

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Introduction

To organize business environment for agricultural producers, companies, associations and other interested actors, in fact, it means organizing individual institutions, their relations on market principles, to arrange all these relations in a consistent system. The condition for this is to organize the functions of the state in a modern way, in terms of an incentive, development-oriented factor of the economy. It should be not that the macroeconomic environment is a composition that functions as consistent

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interactions between individuals and institutions. In that whole, individuals with new rights and obligations need to function, with their new own image. The same is true of all institutions that, with new rules, must have individuals and groups with clearly defined roles.

The Serbia has great potential for the agricultural sector, which is not fully exploited (Simonović et al., 2012). With adequate strategic planning, agriculture can make a significant contribution to the economic development of the country. Because of its connection and influence on other sectors, it is extremely important to the development of Serbia, since it employs, directly or indirectly, a large number of people, participates in a significant part in the external trade, provides nutritional safety of citizens, contributes to rural development and ecological balance. The achievement of agrarian competitiveness requires macroeconomic management to change the basic elements of agricultural development strategies, first of all, towards the creation of sustainable agricultural systems, whose growth is driven by knowledge and innovation, as well as in the direction of market development and agricultural product chains. This is the only reason that agriculture is one of the most important economic activities in Serbia, and is a backbone of economic growth and development (Vojinović et al., 2017).

The municipality of Lajkovac, located in the region of Western Serbia, in the middle part of the Kolubara valley, is the rural municipality of high social responsibility towards sustainable rural development and preservation and improvement of the quality of the environment (Strategy for development of agriculture and rural development of Lajkovac in the period 2011-2015). The municipality has an attractive economic and social environment for the life, work and new employment of the population, as well as the business of business entities, and develops its stimulating business and social climate based on high investments in the development of institutions, infrastructure, human resources, knowledge, innovation and “clean “Technology.

The municipality is cultivating traditional values, continuously strengthening inter-institutional, interregional and inter-ethnic cooperation, contributing to balanced economic and social development and balanced regional development of the Republic, and enabling all inhabitants to have a lot of inclusion in the social and economic life of the community (Development Strategy for Agriculture and Rural Development Lajkovac 2011-2015).

When defining the priorities to the local level, the following documents need to be thoroughly consulted and refer to certain segments of documents depending on which of the listed sectors are appropriate. These include (Mihailović et al., 2007): 1. Serbia's National Strategy for Serbia's Accession to the European Union; 2. Serbia's Action Plan for Implementation of Priorities of the European Partnership; 3. Poverty Reduction Strategy; 4. Resource strategies; 5. Joint Program Document for Neighboring Programs; 6. Action plans for the Government of Serbia and 7. Policies of individual levels. Also, all local development plans that already exist or are being drafted should also be taken. Special attention should be paid to the overall goal during the development of

local development plans. The general goal should be defined at the level at which it is possible to check whether the envisaged changes and improvements occur and whether the desired situation is closer than in the definition period. Each local community should see and perceive its real possibilities and capabilities in the realization of the planned general goal. The mistakes that most commonly appear when defining the general goal are related to the over-expressing of the general goal. The general objective should be defined so that it includes the following principles (Mihailović et al., 2007): to contribute to the achievement of the overall strategic priorities of the Republic of Serbia; Not to be too general in character or too ambitious; To be expressed by pointing to the target groups and being expressed as the desired changed state, not as a process.

There are many types of strategies and a wide repertoire of strategic options on the field of agriculture and the food industry. It is important that the process of selecting the strategy is appropriate to the very nature of the strategic situation. In order to define a strategic situation, it is primarily important to deal with the analysis of the business environment and resources. The purpose of the analysis is to identify possible chances and hazards and thus create a basis of directing effort. Defining a strategic situation is part of a conceptual framework that shows the relationship between a strategic situation, a strategic focus, and a strategic option. When defining a strategic situation, we must analyze the environment and resources in agriculture. The environment can be: general and targeted, favorable and unfavorable, good and bad, urgent, delayed and permanent. Also, the impact on agricultural production can be negative, positive and stabilizing.

Today we see sustainable development through the ability to improve the quality of life and its maintenance for future generations arising from three basic factors: environment, economics and societies. Developed industrial countries place "health and knowledge" at the very top of their development priorities and define this as the essence of the quality of human life (Mihailović et al., 2007). Despite its widespread use, sustainability is a term used and interpreted in various ways (Dobson, 1996). For a long time, the concept of sustainability has largely remained a synonym for the sustainability of the human environment. Recently, it has been expanded not only to consider the environment, but also to economic and social development (Elkington, 1998). This extension of the concept of sustainability was created primarily because it is not only impractical, and sometimes even impossible, to analyze the sustainability of the natural environment without considering the social and economic aspects of relevant social communities and their activities.

Another argument for the continuation of this consideration is that if capital should be extended to future generations, then it is logical that it should also be extended to all of the present generation. Therefore, one of the primary goals set by the World Commission for Environment and Development is the eradication of world poverty and inequality. As noted, the sustainability of agriculture can be viewed through three components: ecological, economic and social. This points to the following definition: "Sustainability refers to the long-term maintenance of the system in accordance with the human environment, economic and social development" (Đuričin, 2006). Although

this definition serves to determine the basic content of the concept of sustainability, it is obvious that sustainability as a phenomenon represents a specific goal to be achieved. The design of sustainable development as the goal of the business activity of the company is most fully expressed through the term “triple bottom line.” The “triple bottom line” is a term that was formulated and strongly advocated by John Elkington, director of the Consulting Company for strategy of sustainability and author of numerous influential books on the corporate environment. His view of this concept is based on the idea that business does not only relate to one goal that is reflected of maximizing economic value, but has added an expanded set of goals that involves the involvement of the environment and the wider community.

Materials and methods

In order about accomplish the research task, all available sources of information will be used: 1) Official local statistics, i.e. The data onto the Republic Bureau of Statistics; 2) National and municipal strategies and development documents from a specific area; 3) Materials of the Serbian Chamber of Commerce and other domestic institutions and organizations; 4) Research of domestic and foreign authors in the thematic field; 6) Research carried out by the Institute of Agricultural Economics and its associates in the previous period.

In the realization of the research task, which refers to the assessment of agricultural potentials and defining the development priorities to the municipality of Lajkovac, the analysis of secondary data will be used (the Agricultural Census from 2012, etc.), spatial analysis of the relevant variables, as well as research based on focus groups made up of Stakeholders interested in the agriculture and food industry of the municipality of Lajkovac.

Also, a valuable support for the diagnosis of the condition in this area will be a “SWOT” analysis, based on which the development priorities and strategic directions of action will be formulated. By combining these methods of research, a more reliable answer to key issues arising from the analysis of agriculture, food industry and development priorities of the municipality of Lajkovac can be obtained.

Results

Given that the Gross Value Added (GVA) and Gross Domestic Product (GDP) statistics are not available at the JLS level (Local Self-Government Unit), the structure of GVA by activity for the level of the Kolubara region is given below (Table 1).

Table 1. Gross value added by activity in the Kolubara region, 2013.

Activity	Value, mil. RSD	Structure, %
Agriculture, forestry and fisheries	11,170	20.07
Mining, manufacturing, electricity, gas and steam supply, water supply and waste water management	15,509	27.87
Construction	2,024	3.64
Wholesale and retail trade and repair of motor vehicles, transport and storage, accommodation and food service	8,534	15.34
Information and communication	516	0.93
Financial and insurance activities	562	1.01
Real estate business	6,098	10.96
Professional, scientific, innovation and technical activities; Administrative and support service activities	1,234	2.22
State administration and compulsory social security, education, health and social protection	9,156	16.45
Arts, entertainment and recreation and other service activities	840	1.51
In total	55,643	100.00

Source: Statistical Yearbook of the Republic of Serbia, 2015

Note: GVA (Gross value added) is obtained as the difference between the value of production and intermediate consumption

The structure of gross value added by activities shows that according to this indicator in the Kolubara region dominate: 1) Mining, manufacturing, electricity, gas and steam to supply, water supply and waste water management (27,87%) and 2) Agriculture, forestry and the structure of the economy for the level of the municipality of Lajkovac was obtained through the employment indicators (Table 2) and based on the market analysis of the most important enterprises in the economy.

Table 2. Economically active population engaged in activity in Lajkovac, 2011.

Activity	Employee number	Structure (%)
Agriculture, forestry and fisheries	2,006	30.18
Mining	1,311	19.72
Manufacturing industry	734	11.04
Electricity, gas, steam and air conditioning supply	136	2.05
Water supply; waste water management control of the waste removal process and the like	87	1.31
Construction	285	4.29
Wholesale and market. on a little; repair of motor vehicles and motorcycles	367	5.52
Traffic and storage	367	5.52
Accommodation and food services	83	1.25
Information and communication	40	0.60
Financial and insurance activities	28	0.42
Real estate	1	0.02

Activity	Employee number	Structure (%)
Professional, scientific, innovation and technical activities	56	0.84
Administrative and support service activities	353	5.31
State Administration and Defense; compulsory social security	315	4.74
Education	230	3.46
Health and social work	161	2.42
Art; entertainment and recreation	31	0.47
Other service activities	47	0.71
Household activity as an employer; activity of households producing goods and services for their own use	-	0.00
Activities of extraterritorial organizations and bodies	1	0.02
Unknown	8	0.12
In total	6,647	100.00

Source: Census of Population, Households and Dwellings in the Republic of Serbia, 2011

According to the Census of Population, Households and Housing 2011 in the structure of the economically active population engaged in occupation in Lajkovac, the largest percentage of the population is engaged in (Table 2):

- agriculture (30.18%);
- mining (19.72%);
- manufacturing industry (11.04%).

In the structure of the Lajkovac industrial economy, the dominant sector is dominated by the individual sector (<http://skgo.org/municipalities/16/privreda>). Important are the following: agriculture, livestock, vegetable and fruit growing. According to the data onto the Department of Economy and Property Legal Affairs of the municipality of Lajkovac, there are two industrial zones. One is on the surface of 104.5 ha at the entrance to Lajkovac (privately owned land with infrastructure, here is “Vindija”, “Dairy MO”, silo), and the second zone (industrial zone 2, area of 149.7 ha In KO Nepričava) will be built along the highway, at the end of the road (Corridor 11). The main goal of creating a new industrial zone is attracting investors and assigning purposes of unearned land in accordance with their requirements and needs, which is a valuable asset for *Greenfield* investments. Environmental practice shows that greenfield investment has had an impact on economic growth, since this form of investment, apart from directly (increasing employment, exports, taxes paid by the state) indirectly affected their economic development - the arrival of Greenfield creates subcontracting chains and develops small And Medium Enterprises (Report on Strategic Environmental Impact Assessment of Detailed Regulation Plan, Industrial Zone 2, Lajkovac, 2014). This approach is justifiable since the key constraints of the local economy are: low level of economic activity, lack of market, underdevelopment of the private sector, entrepreneurship, management and marketing skills (Local sustainable development strategy of the municipality of Lajkovac for the period 2015-2025).

For the purpose of a more detailed introduction to the economic structure in the municipality of Lajkovac, the following companies are listed:

- Elmont-drive RB “Kolubara”. The company was founded in 1969. A small electro-machine, assembly and production company, which was founded by eight workers. As an independent business until 1983. Then it is part of the then SOUR REIK “Kolubara” in Lazarevac, more precisely in “Kolubara Metal”, and since 1990 in EPS. Today, the Elmont plant is organized in four work units: “Energy”, “Telecommunications”, “Metal Plant” and “Maintenance”.
- EPS RB “Kolubara” - Surface mine “Tamnava - Zapadnopolje” gave the highest amount of coal in the system of the Mining Basin “Kolubara”. Annually, out of a total of 29, about 14 million tons of lignite are produced in this coal mine. So it was before the flood, and it is expected that this figure will be re-established this year;
- - “Vindija” d.o.o., Lajkovac. Vindija’s business headquarters in Serbia is located in Lajkovac and unites the factory of poultry meat products of the Vojvodina Plandiste opened with May 2009. In installations covering an area of 7,000 m², more than 200 workers are employed, the majority of local residents. The high quality of products coming from Plandište was confirmed by obtaining an export control number for export of goods to the European Union (<http://www.vindija.hr>);
- Dairy MO, Lajkovac. It is located in the very town of Lajkovac. The company’s production program includes milk and dairy products. The most prevalent products are: yoghurt, pasteurized milk and hard cheese;
- Fruvlader for fruits “Fruvela” d.o.o. was founded in 2006. There is a cold storage in Serbia and this part of Europe. The main activities of the refrigerator are the processing, purchase, export and freezing of fruits. The main products are: strawberry, raspberry, blackberry, cherry, plum and apricot in various forms. Production of Fruvel refrigerator is based on ISO 9001: 2008 and HACCP standards. At the same time, strawberries, raspberries, cherries, plums and apricots are exported from the Fruvela refrigerator to EU countries. (<http://www.fruvela.com>);
- BorverkEurotrade. The area of activity of the company is the production of packaging materials from plastic masses, that is, the company is engaged in the production and sale of five preforms and bottles, from which the blowing gets the bottles of the desired shapes. Patented production and technology guarantee high quality preforms and bottles of various sizes, colors and sizes. (<Http://www.borverk.rs>);
- Iva Agrard.o.o. Lajkovac. This Comapany exists on more than 15 years and employs up to 50 workers. The leading producer of substrates for cultivating plants “Magic Land”, is the leader in the production of building stone and all types of stone agreras in the quarry OSTREŠ, and since 2008 the IVA GIFT SHOP (<www.iva-agrar.rs>) was opened with the company;

- “MikroElektronika” is engaged in the production of software and hardware tools for microcontrollers. As pioneers in Serbia, they have written and published numerous books in this field, and among their clients, they are even “Sony”, “Hitachi” and many others (<http://www.mikroe.com>);
- “Sanikomerc” is a family company with a tradition of over twenty years, based in Lajkovac. Products of carton transport packaging, more precisely “American boxes”. There are 1,300 products in the assortment, have capacities and opportunities to respond to the requirements of the European market. Currently, they work with thirteen employees;
- “Borverk” d.o.o. Lajkovac is a company for production, trade and import-export, established in 1990. Borverk is in the status of an active company. The main activity of the company is the exploitation of building and decorative stone (<https://borverk.ls.rs/rs>);
- “Nodel” is an enterprise for marketing, engineering, manufacturing, marketing and post-marketing services, doo Lajkovac. The company was founded in 1997. The main activity of the company is the production of knitted and crocheted socks.

In the Municipality of Lajkovac there are opportunities for development of service activities, among which are particularly deficient personal services, individual craft services, information and project services, marketing services, various consulting and business services to the SME sector, trade services, hotel and catering services, services in the agricultural sector And other activities (Local Sustainable Development Strategy of the Municipality of Lajkovac for the period 2015-2025).

In the following period, the improvement in the economic structure of the municipality of Lajkovac can be accelerated by the inflow of funds of investments in new enterprises and the recapitalization of existing ones. Also, infrastructure facilities for industrial zones as well as local facilities and incentives will be significant for further growth and development of the entire economy in the territory of the municipality of Lajkovac.

Importance and role of agriculture and agro-industry in the municipal economy. Participation in gross value added (GVA) of agriculture in the gross domestic product (GDP) of the Republic of Serbia in the period 2007-2014. The average annual amount is 6.6% (Economic accounts of agriculture in the Republic of Serbia 2007-2014).

Importance and contribution of agriculture the GDP of Serbia is especially high when the activities of agriculture, the contribution and value are created in the food industry, the production of beverages and tobacco. However, the export of agrarian farmers is dominated by primary agricultural products and products of low added value (Serbian Chamber of Commerce, 2016).

Given that the SBS does not have economic accounts of agriculture at the level of the region, the area and the local self-government unit (Local Self-Government Unit), The point of the municipality of Lajkovac is analyzed through indicators of employment,

factor conditions for the development of agriculture, companies operating in the agricultural food sector, etc.

The participation in active farmers (economically active population in the sector A, "Agriculture, forestry and fishery") in the total economically active population that is engaged in the occupation in the municipality of Lajkovac amounts of 30.18%, which is more in comparison with the republican level (14.8% , But still lower than the level of participation in the Kolubara region of 40.06% (Table 3).

According to the data onto the Department of Economy and Property Legal Affairs of the Municipality of Lajkovac, a large number of employees in the Kolubara Mining Basin and migration of young people for education and work engagement have resulted in a small number of farms mainly engaged in agriculture. Consequently, there are no large, market-oriented agricultural holdings, nor intensive agriculture.

Table 3. Number of active farmers in the Kolubara region and the municipality of Lajkovac, 2011

	Economically active population	Number of active farmers	Participation of active farmers in economically active population (%)
Republic of Serbia	2,304,628	340,186	14.8
Kolubara district	72,899	29,200	40.06
Valjevo	35,500	9,605	27.06
Lajkovac	6,647	2,006	30.18
Ljig	5,902	2,929	42.63
Mionica	6,339	3,594	56.70
Osecina	6,058	4,327	71.43
Ub	12,453	6,739	54.12

Source: Census of Population, Households and Flats in Serbia 2011 (Economically active population engaged in activity by activity)

The municipality of Lajkovac has favorable factor conditions for the development of agriculture. The favorable climatic factors, the diversity of the types of land, favorable hydrogeology and good road infrastructure are good conditions for the development of agricultural production, and above all, livestock, forestry and fruit growing (Local Lajkovac Development Strategy for the period 2015-2025).

Plant production, fruit and wine production do not take a significant place, although favorable conditions exist on this (Agricultural List, 2012). The municipality of Lajkovac has a significant tradition in livestock production, especially when it comes to cattle breeding.

Lajkovac, a traditional exhibition of breeding cows and heifers of the Simmental race, is being known, which has been holding and gathering in Lajkovac high quality Simmental throats, not only from the municipality of Lajkovac, but also from neighboring municipalities (Local Sustainable Development Strategy of the Municipality of Lajkovac for the period 2015-2025.).

Primary agricultural production is dominant in the sector of family farms. According to the Census of Agriculture in 2012, registered breed farms is 1,516, and the total number of agricultural holdings is 2,578. The utilized agricultural land (KPZ) is 10,291 ha and its share in the total area of JLS is 55%. The average size of the land (KPZ) per farm is 3.99 ha. Namely, the municipality is dominated by small, non-specialized agricultural producers without clear business and market orientation. The result of such a production structure and poor governance are low and irregular income with the absence of serious planning, development and major investments (Program of Measures for Support for Implementation of Agricultural Policy and Rural Development Policy for the Municipality of Lajkovac in 2016). According to the data onto the Department of Economy and Property Legal Affairs of the Municipality of Lajkovac (Report for the Focus Group meeting in the premises of the municipality of Lajkovac, 2016):

- Farming is represented only for crops that serve as animal feed, which means that valorization is done through livestock breeding;
- Vegetation is not developed;
- Orchards have plenty of farmers, but there are no large, modern orchards, or fruit market production. In the production of brandy, the most common plum is, and in the town of Bajevac there is one plantation of blueberries;
- Cattle breeding's in decline, with only a few larger farms in cattle production (fodder cattle, dairy farms) in Vračević, Strmovno, Pepeljevac (in this place there is also a larger farm of pigs of about 800 fattening animals), Stepanje, Bajevac;
- Vindija from Varaždin has a farm for fattening broilers in the town of Rubribreza, and in Lajkovac (Varos) there is a central and distribution center;
- Poultry is not significantly developed with the arrival of Vindija. There is no cooperation between Vindija and family farms. There are two larger broiler farms in the agricultural holdings sector;
- There is interest in sheep breeding and beekeeping, and the goat is poorly developed;
- There are no interested agricultural producers for organic production.

In the processing of agricultural products, a smaller number of subjects in the SME sector is registered: Processing of poultry meat ("Vindija" doo, Lajkovac); Cereal (mill of the company "Agraria Campo"); Milk ("Dairy MO", Lajkovac); Fruit (Fruvela Fruit); Production of substrates for cultivation of plants ("Iva Agrar" doo Lajkovac). With regard to the development of Lajkovac agriculture in the coming period, it will be important to develop the processing sector, that is, capacity building, especially in the MESP sector, in the field of processing meat, milk, fruit and vegetables. It will also be important to invest in plants for sorting, packaging and standardization of fruits and vegetables, as well as in the processes of implementation and certification of food safety and quality systems.

Discussions

Each local development initiative must take into account that the territory is a system or a set of complex elements that act on the basis of their own complex nature and properties (Mihailović et al., 2007). It can not be denied that the imposition of external (alien) development models often contributes to the banalization of those territories that have been the subject of such models. Each local self-government should itself find the best modality for making its own plan. The essence of the local agricultural development plan should be seen in obtaining a document that is based on integrity and integrity in order to obtain a genuine decision-making process.

The applied measures and activities aimed at overcoming the unfavorable situation in this sector did not yield the desired results (Nikolic et al., 2017). Consequently, when defining a strategy, there should be three key elements: participation of the population and local authorities, social consensus, sustainability. The overall objective of local agricultural development should be directed towards improving the material and social status of the local population, promoting an integral rural development model based on linking rural with the city economy and diversifying economic activities in the countryside. Consequently, the following results should be expected: increasing competitiveness, more complete use of all resources, harmonizing agricultural production, increasing employment and income of the population. Achieving these results requires the real creation of a “SWOT” matrix (Table 4).

The optimal strategy for the development of agriculture and food industry in the municipality of Lajkovac in the “SWOT” environment is a mini - maxi strategy that implies minimizing weaknesses and threats and at the same time maximizing power and chances in the environment such as regional integration, education and advisory services in agribusiness and etc. Agriculture provides food security for the population, but it is also the main source of raw materials for numerous industrial capacities (Vasiljević et al., 2011). Consequently, the strategic objective of the municipality of Lajkovac in the field of agriculture and rural development is to strengthen the competitiveness of developmentally oriented agricultural holdings, protect and preserve the environment and cultural and historical values, as well as to improve the living standards and conditions for employment and the life of the rural population (Development Strategy for Agriculture and Rural Development Lajkovac period 2011 - 2015).

Table 4. SWOT matrix of agriculture and rural development of the municipality of Lajkovac

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> • In Lajkovac municipality there are opportunities for development of service activities, among which are particularly deficient personal services, individual craft services, information and project services, marketing services, various consulting and business services to the SME sector, trade services, catering and hotel services, services in the sector Agriculture and other activities. • The participation IN active farmers in the total economically active population that occupies the profession in Lajkovac amounts to 30.18%, which is more in comparison with the republican level (14.8%). • The Municipality of Lajkovac has favorable factor conditions for the development of agriculture. Favorable climatic factors, diversity of soil types, favorable hydrogeology and good road infrastructure are good conditions for the development of agricultural production, and above all, animal husbandry, agriculture and fruit growing. • The Municipality of Lajkovac has a significant tradition in livestock production, especially when it comes to cattle breeding. • Lajkovac, a traditional exhibition of breeding cows and heifers of the Simmental race, is known, which has been holding and gathering in Lajkovac high quality Simmental throats, not only from the municipality of Lajkovac, but also from neighboring municipalities. 	<ul style="list-style-type: none"> • The municipality is dominated by small, non-specialized agricultural producers without clear business and market orientation. • The result of the production structure and poor governance are low and irregular income with the absence of serious planning, development and greater investment. • Undeveloped processing of agricultural products on family farms and the MESP sector. • A large number of employees in the Kolubara Mining Basin and migration of young people for education and work engagement have resulted in a small number of farms mainly engaged in agriculture. • There are no large, market-oriented agricultural holdings, nor intensive agriculture. • In the structure of plant production, fruit and vineyards do not occupy a significant place, although favorable conditions exist for this. • Farming is represented only for crops that serve as fodder, which means that valorization is done through livestock breeding. • Stock row is in decline, with only a few larger farms in cattle breeding. • Poultry is not significantly developed with the arrival of Vindija. There is no cooperation between Vindija and family farms. • Insufficient activities in the domain of adding value to agricultural products.
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> • Transition in Serbia started in 2000, when the basic preconditions for its implementation were acquired. Liberalization of trade relations and capital balance enabled the integration of Serbia's economic system into international financial and commodity flows. • Completion of market institutions, in particular the development of financial markets, the development of an efficient market for goods and services, the construction of infrastructure, more efficient state administration and the judiciary, and the reduction of corruption - are necessary preconditions for developing a stimulating macroeconomic environment. 	<ul style="list-style-type: none"> • In the macroeconomic environment of Serbia there are various gaps that can be eliminated by a new approach that implies major changes, which are aimed at establishing a new relationship towards the macroeconomic environment. • Companies have long been doing their business activities that characterized the inefficiency and lack of motivation of employees. • Inadequate economic development of Serbia is determined by a number of factors, among which the unfavorable structure of the economy, the loss of traditional markets, financial indiscipline, insufficient investment, etc. are distinguished.

Source: Author's Research, 2016

The pillars of the realization of the goal will be based on high investments in the construction of social, physical and economic infrastructure, while encouraging greater application of knowledge and innovation and respecting the principles of sustainable development and equal rights for all. Precondition for achieving the vision and strategic goal of the Municipality in the field of rural development - Is the realization of specific objectives, as well as measures and projects within the framework of the three selected development priorities (development directions). The three (3) defined development priorities essentially determine the way in which the strategic goal is to be realized, i.e. they are instruments of the strategic goal of the Municipality in the field of agriculture and rural development (Strategy for development of agriculture and rural development in Lajkovac 2011-2015): 1) Development priority: Strengthening the competitiveness of the agrarian sector in the domestic and foreign markets; 2) Development priority: Sustainable management of natural resources and environmental protection; 3) Development priority: Improving the quality of life of the rural population and the diversification of the rural economy

For each of the defined development priorities, realistic measures have to be identified in order to achieve development priorities and specific goals in priority directions within a specific time frame. Measures of the first development priority are the following (Strategy for development of agriculture and rural development in Lajkovac in period 2011 - 2015): 1) Education and advisory support to farmers; 2) Protection and preservation of agricultural land and improvement of agricultural infrastructure; 3) Supporting farmers to boost productivity and competitiveness of agricultural production; 4) Establishment, development and strengthening of farmers' association through forms: associations, cooperatives, clusters; 5) Development of new products with higher added value, with improvement of product quality and introduction of quality standards; 6) Promotion of the promotion and placement of agricultural food products; 7) Strengthening the institutional capacities of the municipal administration in the area of rural development and improving inter-institutional cooperation.

Measures of the second development priority (Strategy for development of agriculture and rural development of Lajkovac in the period 2011 - 2015): 1) Environmental situation analysis; 2) Reducing the negative impact on the Kolubara coal mine on the environmental quality of the Municipality and the Region; 3) Solid wastes management; 4) Management of waste and atmospheric waters; 5) Affirmation of renewable energy programs; 6) Increasing the area under the greenery; 7) Education of local actors and population in the field of environmental protection; 8) Environmental monitoring (continuous measurement of environmental parameters); 9) Networking of all stakeholders related to issues of environmental protection and improvement.

Finally, the measures of the third development priority (Development Strategy of the Agriculture and Rural Development of Lajkovac in the period 2011-2015): 1) Construction and improvement of physical and communal infrastructure in the villages; 2) Improving social infrastructure in villages and providing health and social protection; 3) Protection and preservation of cultural and historical heritage; 4) Change of the

rural economy towards the diversification of economic activities in the countryside; 5) Retention and return to young people to the village; 6) Promote LIDER's approach to rural development. Through the presented development priorities and measures, the guidelines on the future agricultural development of the municipality of Lajkovac are laid out on the basis of sustainability, whose realization would show that Lajkovac is a socially responsible community, which uses its potentials and resources, in order to provide better living conditions for all its inhabitants, according to the principles equality and justice.

Conclusions

The development of rural areas is closely linked to the development of agriculture and the processing of agricultural products, so the agricultural production is traditionally the most important sector of the rural economy and the main source of income for the rural population. Consequently, investments in the development of micro-enterprises in the field of processing of agricultural products are necessary, as well as raising the value of products by obtaining the designations of geographical origin. By investing in the mentioned activities, the competitiveness of agricultural holdings on the market would be improved, increasing the income of the farms would improve their economic position, which would enable better quality of life in rural areas and reduce the rate of depopulation of rural areas. Conditions that would contribute to the employment of the rural population are the strengthening of entrepreneurship and the development of micro-enterprises.

Based on the research results, the following conclusions can be drawn:

- The municipality of Lajkovac has favorable factor conditions for the development of agriculture. The favorable climatic factors, the diversity of the types of land, favorable hydrogeology and good road infrastructure are good conditions for the development of agricultural production, and above all, livestock, forestry and fruit growing;
- The municipality is dominated by small, non-specialized agricultural producers without clear business and market orientation. The result of such a production structure and poor governance are low and irregular income with the absence of serious planning, development and major investments;
- The municipality of Lajkovac has a significant tradition in livestock production, especially when it comes to cattle breeding;
- It will also be important to invest in plants for sorting, packaging and standardization of fruits and vegetables, as well as in the processes of implementation and certification of food safety and quality systems.
- With regard to the development of Lajkovac agriculture in the coming period, it will be important to develop the processing sector, that is, capacity building, especially in the MESP sector, in the field of processing meat, milk, fruit and vegetables.

Vision of Agriculture implies the development of more propitious and more competitive agriculture composed of commercial and family farms dealing exclusively with agriculture and / or dealing with agriculture in terms of additional source of income. However, the desired future of this area will not be distorted by itself or because someone is eager to do so. The desired future and the achievement of the strategic goals of the Lajkovac municipality in the field of agriculture require immediate action. The future of the economic vitality of local communities to a lesser extent is the function of available resources and geographical position, and more strong leadership and effective strategy.

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Conflict of interests

The authors declare no conflict of interest.

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IMPACT OF FIRM SPECIFIC FACTORS ON PROFITABILITY OF INDUSTRIAL GRINDING COMPANIES

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ABSTRACT

In this paper, panel ordinary least squares model of industrial grinding companies listed on Belgrade Stock Exchange was used for examining the determinants of profitability. For this purpose, 62 observations of companies over the period of 2008 – 2014 were included. Return on equity considered as a measure for profitability is a dependent variable whereas size, leverage, years of firm existence, number of stock and book value per share are considered as independent variables. According to the findings, leverage, number of stock and book value per share are statistically significant of inverse relationship with profitability for selected listed industrial grinding companies in Serbia. Size (+) and age (-) indicate insignificant impacts on profitability. The results revealed that all independent variables explain 84.4% of the variance on return on equity. The results of Granger causality test indicated causality between profitability and leverage, profitability and number of stocks are bidirectional.

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Introduction

Firms' profitability and ways of improving it are hotly debated issues among managers and scholars. Identification of the sources of variation in firm level profitability is an important research theme in economics, strategic management and accounting and finance (Goddard, Tavakoli & Wilson, 2005). It is known that the determinants of the profitability of manufacturing firms are very important in accordance with the economic development of any country, therefore, more research in this area is necessary. Stekla and Grycova (2016) said that the capital structure decision is very important because a bad decision can affect a company's profitability leading to a decrease in the shareholders' value. Several empirical studies have attempted to identify firm profitability determinants, focusing on firms in different industry sectors and in different periods (e.g. McDonald, 1999; Adams and Buckle, 2003; Yazdanfar, 2013; Tomsik et al., 2016; Kroupova, 2016). Profitability of the firm is highly influenced by internal and external variables.

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The study therefore proposed the following research questions:

1. What is the relationship between Firm size and corporate profitability?
2. What is the relationship between Years of firm existence and corporate profitability?
3. What is the relationship between Financial Leverage and corporate profitability?
4. What is the relationship between Number of stock and corporate profitability?
5. What is the relationship between Book value per share and corporate profitability?

Objectives of the Study

The objectives of the study are to:

1. Analyze the relationship between Firm size and corporate profitability?
2. Analyze the relationship between Years of firm existence and corporate profitability?
3. Analyze the relationship between Financial Leverage and corporate profitability?
4. Analyze the relationship between Number of stock and corporate profitability?
5. Analyze the relationship between Book value per share and corporate profitability?

The Tested Hypotheses

This study tests the following five null hypotheses: The following hypotheses have been developed to achieve the stated objectives

H01: There is statistical significant relationship between firm's size and profitability of industrial grinding companies in Serbia

H02: There is statistical significant relationship between years of firm existence and profitability of industrial grinding companies in Serbia

H03: There is statistical significant relationship between financial leverage and profitability of industrial grinding companies in Serbia

H04: There is statistical significant relationship between quotation on the stock exchange (number of stocks) and profitability of industrial grinding companies in Serbia

H05: There is statistical significant relationship between book value per share and profitability of industrial grinding companies in Serbia

Current studies do indicate that panel data analysis is more suitable than other methods of study in determining the profitability of manufacturing companies. Therefore, this research paper also hopes to explore the relative importance of determinant of profitability of industrial grinding companies in Serbia by using the panel data analysis.

Pratheepan (2014) concluded that size is statistically significant of positive relationship with profitability (Return on assets) whereas tangibility showed statistically significant of inverse relationship with profitability for selected listed manufacturing companies in Sri Lanka. Leverage and liquidity indicated insignificant impacts on profitability.

Sivathaasan et al. (2013) investigated whether factors such as capital structure, working capital, firm size, non-debt tax shield and growth rate, determining profitability have any impact on profitability of selected manufacturing companies listed on Colombo stock exchange, Sri Lanka over a period of five years from 2008 to 2012. The results revealed that whereas all independent variables explain 76.6% and 84.7% of the variance on ROA and ROE respectively where significant is at 5% levels. Further, while capital structure (+) and non-debt tax shield (+) have statistically significant impact on profitability, the remaining working capital (+), growth rate (-) and firm size (+) have no significant effect on the profitability.

Azhagaiah and Deepa (2012) showed that volatility and growth are the major predictors in determining profitability in case of small size firms while growth is important in determining the profitability of medium size firms. Capital intensity has a significant positive coefficient with the profitability of large size firms. The overall result showed that the larger the size of the firm, the more the investment in long lived assets has helped to increase the profitability of the firm unlike the trend in cases of small size and medium size firms.

Vătavu (2014) established the determinants of financial performance in 126 Romanian companies listed on the Bucharest Stock Exchange, over a period of ten-years (2003-2012). Regression results indicated that profitable companies operate with limited borrowings. Tangibility, business risk and the level of taxation have a negative impact on return on assets. Although earnings are sustained by significant sales turnover, performance is affected by high levels of liquidity. Periods of unstable economic conditions, reflected by high inflation rates and the current financial crisis, have a strong negative impact on corporate performance.

Bhayani (2010) covered the all listed cement firms working in India for the period of 2001 to 2008. To determinant profitability backward regression analysis were used on the variables of the study. The result of the study showed that liquidity, age of the firm, operating profit ratio, interest rate and inflation rate has played a vital role in the determination of the profitability of Indian Cement Industry.

Al-Jafari and Al Samman (2015) investigated the determinants of profitability for industrial firms in Oman. Therefore, a sample of 17 industrial companies listed on Muscat securities market covering the period from 2006 till 2013 is utilized. Results from the panel ordinary least squares model revealed a positive and statistical significant relationship between profitability, the firm size, growth, fixed assets and working capital. On the other hand, the average tax rate and the financial leverage variables showed a negative relationship with profitability. However, this relationship was significant only for the financial leverage variable. The study concluded that large growing firms with efficiently managed assets improve revenue and ultimately enhance profitability.

Stekla and Grycova (2016) found a negative relationship between the profitability and debt across of agricultural holdings in the Czech Republic for a period of six years from 2008 to 2013.

Materials and methods

In summary, studies researching the determinants of profitability have identified several factors. The impact of specific firm factors was derived from previous studies - theoretical and empirical concepts. To analyze the factors which influence the profitability of industrial grinding companies in Serbia.

Table 1. Research variables - dependent and independent variables

Symbol		Measurement	Expected sign
Independent variable			
ROE	Profitability	Return on equity	
Dependent variables			
SIZE	Firms' size	Total Assets	+
AGE	Years of firm existence	Number of years of firm existence	+/-
LEV	Leverage ratio	Ratio between total loans and equity	-
STOCK	Quotation on the stock exchange	Number of stocks	-
BV	Capital structure	Book value per stock	-

Source: Author

In order to obtain a regression model, it was necessary to determine: which observed factors influence the profitability of industrial grinding companies, by what intensity and in what direction.

The panel ordinary least squares model is used as in equation 1 to examine the effect of the independent variables on the dependent variable of profitability of industrial grinding companies in Serbia, and to test the above five null hypotheses:

$$ROE = \beta_0 + \beta_1 SIZE_{it} + \beta_2 AGE_{it} + \beta_3 LEV_{it} + \beta_4 STOCK_{it} + \beta_5 BV_{it} + \varepsilon_{it} \quad (1)$$

Where:

Profitability: Measured by return on equity (ROE)

β_0 = Coefficient of Intercept (Constant)

$\beta_1 - \beta_5$ = Coefficients of Slope

ε = error term.

i, t – company (i) in time (t)

Results and Discussions

Descriptive statistics for the variables are given in Table 2. The descriptive statistics is based on 9 industrial grinding companies' 7 years data set which includes 62 observations.

Table 2. Descriptive statistics of variables

	ROE	SIZE	AGE	LEV	STOCK	BV
Mean	-0.123440	1183790.	16.32258	2.074137	246129.9	11318.53
Median	0.036715	882077.0	16.50000	0.928787	124433.0	1876.152
Maximum	0.580337	3289873.	24.00000	42.21247	1465771.	51398.05
Minimum	-4.323703	91202.00	9.000000	0.046635	32757.00	24.23442
Skewness	-4.722447	0.729367	0.008034	6.482181	2.594759	1.487105
Kurtosis	26.34651	2.183138	1.785200	46.86051	8.006591	3.615555
Jarque-Bera	1638.519	7.220850	3.812991	5403.866	134.3257	23.83083
Probability	0.000000	0.027040	0.148600	0.000000	0.000000	0.000007
Observations	62	62	62	62	62	62

Source: Author

Table 2 comprises the main descriptive statistics for the variables used in the analysis. Furthermore, the table above indicates that there is high variation in return on equity. This result is consistent with high variation in financial leverage variable because higher degree of financial leverage will lead to more volatility in earnings. The correlation matrix for the variables is reported in Table (3).

Table 3. Correlation between variables

	ROE	SIZE	STOCK	LEV	AGE	BV
ROE	1					
SIZE	-.153	1				
STOCK	-.517**	-.363**	1			
LEV	-.905**	.156	.467**	1		
AGE	.078	-.125	-.124	-.058	1	
BV	.107	.693**	-.698**	-.151	-.135	1

Source: Author

Note: **Correlation is significant at the 0.01 level (2-tailed).

Table 3 shows that there are negative and significant relationship between return on equity and leverage and number of stock. In addition, we can observe that there is no significant relationship between return on equity and size, age and book value.

One of the requirements for testing a good multi-regression model is the non-linearity of the model between independent variables. It is imperative to check for multi-collinearity between the independent variables before we utilize the regression techniques. In general, there are the tolerance test and the variance inflation factor test (VIF) that can detect multi-collinearity. The tolerance level test represents the reciprocal value of the VIF test and is interpreted as a percentage of the variance of the predictor that is independent of the other predictors. The arbitrary value for the multi-collinearity indicator represents for a VIF amount greater than 10, i.e. tolerance level is less than 0.1. The variance inflation factor (VIF) for the test of multi-collinearity measures the relationship of all predictor variables concurrently. It explains how much the variance of a coefficient is inflated due to linear dependence with other explanatory variables.

Table 4. Multi-collinearity statistics - Tolerance test and variance inflation factor

Independent variable	Tolerance (1/VIF)	VIF (>10 collinearity problem)
SIZE	.449	2.228
STOCK	.341	2.936
AGE	.880	1.136
LEV	.655	1.528
BV	.270	3.705
		Mean VIF: 2.3066

Source: Author

Values of tolerance test and variance inflation factor in the VIF test are significantly below the critical values and it can be concluded that the assumption of non-existence of multi-collinearity for model was not impaired. The mean value of VIF (Table 4) is 2.3066, less than 10, which confirms the absence of any multi-collinearity, and the VIF test for individual variables does not exceed the maximum value of 10, and therefore there is no need to eliminate certain variables from the regression analysis. It can be concluded that there is no multi-collinearity problem in this regression model. Further diagnostic tests are executed to ascertain the validity of the model.

Table 5. Heteroskedasticity Test: ARCH

F-statistic	0.465125	Prob. F(1,59)	0.4979
Obs*R-squared	0.477130	Prob. Chi-Square(1)	0.4897

Source: Author

The test for heteroskedasticity (ARCH) also reveals an F-statistic and Obs*R-squared probability values of 0.4979 and 0.4897 respectively, both of which are greater than 0.05, and indicates the absence of heteroskedasticity.

Table 6. Breusch-Godfrey Serial Correlation LM Test

F-statistic	1.408213	Prob. F(2,54)	0.2534
Obs*R-squared	3.073380	Prob. Chi-Square(2)	0.2151

Source: Author

Breusch-Godfrey serial correlation test, used to investigate the presence or absence of autocorrelation. The F-statistic and Obs*R-squared probability values are greater than 0.05 (5% level of confidence), which indicates the absence of autocorrelation in the model.

Table 7. Impact of Firm Specific Factors on profitability of industrial grinding companies

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Model Quality
		B	Std. Error	Beta			
1	(Constant)	2.543	.977		2.601	.012	Adjusted R Square 0.844 F (Sig.) 67.058 (.000) Durbin-Watson stat 2.094315
	SIZE	.026	.050	.039	.515	.608	
	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta				
	STOCK	-.220	.059	-.323	-3.731	.000	
	AGE	-.006	.008	-.040	-.748	.458	
	LEV	-.102	.008	-.804	-12.868	.000	
BV	.000	.000	-.273	-2.800	.007		

Source: Author

The results of the regression model and their statistically significant coefficients presented in table above. Leverage, number of stocks and book value per share are the determinants of return on equity. The presented coefficients in the table above indicate the direction of the relationship between independent variables and the dependent variable. By comparing the absolute values, leverage (-), number of stocks (-) and book value per share (-) have statistically significant influence respectively according to their intensity. An analysis of the model obtained for profitability of industrial grinding companies indicates negative impact of leverage, number of stock and book value per share, that is, with the increase of negatively correlated independent variables, there is a decrease in the value of return on equity. The validity tests of the model, i.e. the *F*, Durbin-Watson, ANOVA and VIF, confirm that the results are robust. In addition, the adjusted R² (84.4%) is high, indicating that the explanatory variables have a significant ability to explain change in the dependent variable.

Based on above results the researcher accepts or rejects the following hypothesis.

H₀₁: There is statistical significant relationship between firm's size and profitability of industrial grinding companies in Serbia. **Rejected**

H₀₂: There is statistical significant relationship between years of firm existence and profitability of industrial grinding companies in Serbia. **Rejected**

H₀₃: There is statistical significant relationship between financial leverage and profitability of industrial grinding companies in Serbia. **Accepted**

H₀₄: There is statistical significant relationship between quotation on the stock exchange (number of stocks) and profitability of industrial grinding companies in Serbia. **Accepted**

H_{05} : There is statistical significant relationship between book value per share and profitability of industrial grinding companies in Serbia. **Accepted**

Table 8. Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
SIZE does not Granger Cause ROE	60	1.28154	0.2858
ROE does not Granger Cause SIZE		0.16225	0.8506
BV does not Granger Cause ROE	60	0.11348	0.8929
ROE does not Granger Cause BV		0.19596	0.8226
LEV does not Granger Cause ROE	60	3.68060	0.0316
ROE does not Granger Cause LEV		3.56644	0.0350
STOCK does not Granger Cause ROE	60	11.5985	6.E-05
ROE does not Granger Cause STOCK		3.43954	0.0391
AGE does not Granger Cause ROE	60	0.71415	0.4941
ROE does not Granger Cause AGE		0.02923	0.9712

Source: Author

The results of Granger Causality Test for the sample indices during the study period is presented in Table 8. We have found that causality between profitability (ROE) and leverage (LEV), profitability and number of stocks (STOCK) are bidirectional, no causality exist between profitability (ROE) and size (SIZE), return on equity (ROE) and age, and return on equity (ROE) and book value per share (BV). The results indicate that, there is bidirectional causality that return on equity have a feedback effect on leverage and number of stocks.

Conclusions

The general of objective of this study was to evaluate the determinants of the profitability of industrial grinding companies in Serbia. A panel ordinary least squares technique is utilized on a sample of 9 industrial grinding companies covering the period 2008 till 2014. The results show a significant negative relationship between leverage, number of stocks, book value per share and profitability. Size (+) and age (-) variables found to have insignificant relationship with profitability. The findings of this study are similar to the results of some variables utilized by Nunes et al. (2009), Asimakopoulos et al. (2009), Sivathaasan et al. (2013), Al-Jafari and Al Samman. (2015). It is known that the determinants of the profitability of manufacturing firms are very important in accordance with the economic development of any country, therefore, more research in this area is necessary.

Conflict of interests

The authors declare no conflict of interest.

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THE NONMARKET ENVIRONMENT OF THE WINE INDUSTRY IN THE REPUBLIC OF MACEDONIA: THE CASE OF WINES OF MACEDONIA ASSOCIATION (FROM MARKET RIVALS TO ALLIES IN THE NONMARKET ENVIRONMENT)

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ABSTRACT

The production of wines contributes strongly to the overall export of Macedonia, having a big tradition and potentials for further development due to good climate and soil conditions. In the same time, the production of wine, in many countries, is one of the highly regulated sectors. Thus, there is a need for wine manufacturers to deal actively with the nonmarket environment and influence on regulatory legislation. Having in mind a big importance of the EU market for the export of Macedonian wines, there is a need for further harmonization with the EU regulation. Subject of this paper is a critical analysis of the economic policies in the field of agricultural production focused on the policy of subsidies. The aim is to show importance of having the active role of the wine producers in the nonmarket environment. Qualitative methodology is based on the experiences of the Wines of Macedonia (WOM) Association and, indicating the possibility of transforming the market rivals into nonmarket allies.

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Introduction

Wine production in the Republic of Macedonia dates to the ancient times, but not until recently the country saw intensified worldwide recognition of its wines both in terms of export figures development as well as the awarded recognitions and accolades on all major wine competitions worldwide. The Republic belongs to the C3 area of the oenological map (www.wzw.tum.de/blm/alt/bmeier/pages/91zonen.htm), being ideal for viticulture of the best quality red grapes.

With both production quantity and mainly quality of Macedonian wine increasing in the past decade (2006 - 2015), driving the successful development and modernization

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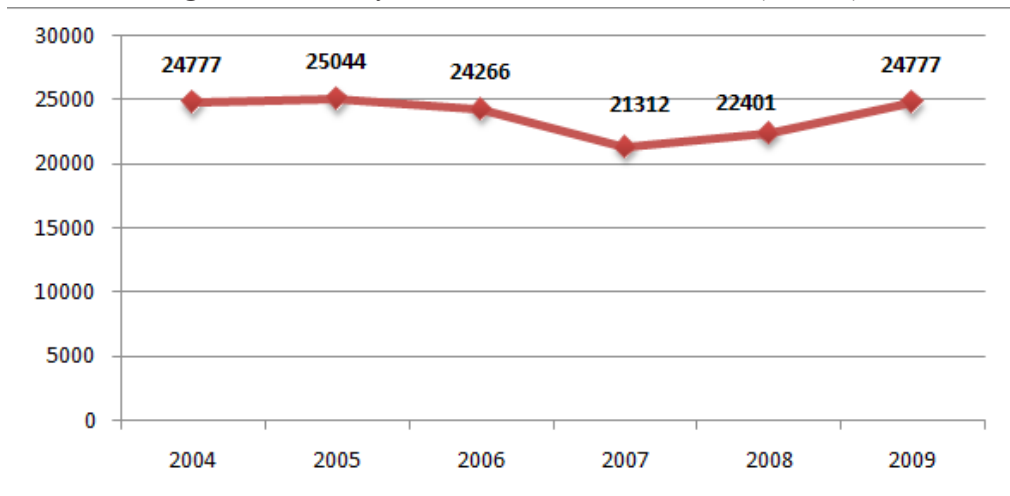
of the wine industry, the objective of this assignment is to analyze the successful implementation of nonmarket strategies by the main players in the industry, derived by their clear understanding of the overall nonmarket environment of the wine industry and its high importance for the office holders in the relevant government bodies.

The discussion topic in this article is to depict the nonmarket environment of the wine industry in the 2006-2015 period and analyze the implementation of relevant nonmarket strategy by the main industry players by creation of a trade association “Wines of Macedonia” (WOM) with main objective to accelerate the country bottled wine exports and represent a voice of the industry in dealings with the country relevant governmental bodies, international promotional agencies and the wine press worldwide. David Barons classic book “Business and Its Environment” and his “4 I’s” model offers a theoretical framework for the analyses.

As we will see from the analysis presented in the following pages, the establishment of a relevant trade association “Wines of Macedonia”, contributed to fast expansion of the wine exports, supported and funded by the Ministry of Agriculture, Forestry and Water economy (MAFWE) of Republic of Macedonia as well as by EU and USAID development programs resulting in more than 250% increase of the bottled wine exports in volume with even further positive influence of all. In the analyses, the need of developing the “bridging” character of this professional association is underlined and, also identified as one of the potential challenges in the WOM’s activity.

According to the Macedonian Ministry of agriculture, forestry and water economy (MAFWE) Annual report 2015, Republic of Macedonia had 22.918 hectares of vineyards in 2015, producing on average 250 t of grapes, of which on average 175 t wine grapes, resulting in average annual wine production of 120 t (1,2 million hectoliters).

Figure 1. Total vineyard area in Macedonia 2004-2009 (hectares)



Source: State Statistical Office

Furthermore, MAFWE annual report 2015 implies that the wine production in Macedonia in 2015 is carried out in 84 officially registered wineries with a total processing capacity of 2, 2 million hl and installed annual bottling capacity of around 650,000 hl. Although apparently insufficient, the bottling capacity is far from utilized as traditionally in the past several decades the Macedonian wine was predominantly exported as bulk.

More than 90% of the registered wineries are with capacity of less than 100.000hl, while only 8 wineries are with capacity greater than 100.000 hl, reflecting the increased interest and development of the industry since 2003 when there were only 28 wineries, as many new small boutique wineries have been established since. Moreover, many of the wineries invested in sophisticated wine making equipment and technologies, so they can be more competitive on domestic and foreign markets focusing on high-quality bottled wines made mainly from local grape varieties like “Vranec”, “Kratosija”, “Smederevka” and “Temjanika”, but also from the international varieties like “Merlot”, “Cabernet Sauvignon”, “Pinot Noir”, “Chardonnay”, “Riesling”, “Sauvignon Blanc” and others. Besides considering the local grape varieties as a kind of a national heritage, the wine producers must follow trend of the globalizing world (being export oriented). Storchmann (Storchmann, 2012) clearly states that the global market delivers a world of wine to ones door/table. Knowing that the wine is an experience good, Macedonian producers have to be aware of the strong role of experts and their reports - overcoming the information gap (Veseth, 2011). The trend is characterized by a strong convergence in the alcohol consumption patterns (Holmes, A.J. and Anderson, K., 2017) and globalization of preferences.

Out of the 1,2 million hl of wine produced annually, only 10% or 120.000 hl is consumed in the country, while the rest being exported, amounting to annual value of 50 million EUR. The importance of wine production illustrates the fact that the economic impact varies from 17% to 20% of the entire agriculture GDP. Wines are the second largest agricultural exports good, after tobacco. EU is the key wine export destination, accounting for nearly 60% of the export volume in 2015, followed by the CEFTA countries. Majority of the volumes are exported as a bulk wine, 87% in 2010, with positive trend in the past years where this figure drops to 66% in 2015 and the rest 34% of the overall wine exports volume accounts to bottled wine.

Subject of this paper is a critical analysis of the economic policies in the field of agricultural production focused on the policy of subsidies. The aim is to show importance of having the active role of the wine producers in the nonmarket environment. Qualitative methodology is based on the case study of Wines of Macedonia (WOM) Association and, indicating the possibility of transforming the market rivals into nonmarket allies. The analytical framework in this paper is based on the analysis of Becker (1983, 1985) and Barron (2010).

Analysis of the wine industry environment (market and nonmarket) and methodology framework (the importance of the Baron's contribution)

The MAFWE National strategy for agricultural development 2014 outlines that after the tobacco production, the wine industry as the second biggest agricultural export sector of Macedonia. According to WoM (www.winesofmacedonia.mk/key-figures/) estimated the economic impact of the wine production to some 17-20% of the agricultural GDP. Approximately 20.000 households in Macedonia located across 15 municipalities (out of 85) grow grapes as main or additional income, representing an important asset of great political value, accounting for approximately 100.000 voters or 7% of the total voters.

The well-known conclusion of Stanford's professor David Baron that some companies could be very successful in the market, facing the strong competition and, in the same time, very unsuccessful in managing their relations with the non-market environment, made a strong impact not only within the academic communities, but in business world, as well. According to Baron (Baron, 2010) explanation of the rent chain concept, a large employment or stakeholder base (suppliers, customers, distributors, capital, communities) is potentially important asset whose value is depending on the number of people affected, their resources and their coverage of political jurisdictions, posing great importance on the Macedonian wine industry for the politics.

In addition, considering the overall political and economic situation in Republic of Macedonia in the past decade (2006-2015), with strong right wing populist government, an individual firm/winery couldn't freely or inconsequentially communicate its issues nor effectively state its interests in front of the government bodies.

During this period, besides the general approach in allocating the financial impulses that is a subject of our analyses, there were periodical measures which were either not long lasting (such as the decision to cover up to 20% of the expanses for marketing and packaging of bottles with wine, in 2012) or other measures, generally seeking a lot of administrative work for the producers and being hard for implementation. In the budget allocation, there was a line for subsidizing the cultivation of the vine plantations. The subsidies vary from 40,000MKD/ha to 15,000MKD/ha.

Table 1. Subsidies for upkeeping the vine plantations/per ha

Land size (ha)	Subsidies (MKD/ha)
From 0,2ha to 5 ha	40,000 MKD
From 5,1ha to 30ha	24,000 MKD
From 30,1ha to 50ha	12,000 MKD
Over 50,1 ha	4,000 MKD

Source: According to Official Gazette of the Republic of Macedonia, No 16, 2015. (1 Eur - 61,2 MKD)

The subsidies on total surface of wine plantations are distributed to legal entity. This redistributive measure of the government was created in order to subsidize the wine plantations up to 2 acres (consequently, gradually decreasing the subsidies for big wine producers, depending of the plantation size). The problem of the profitability of the small grape producers has been, according to the scholars articles (Di Vita and D'Amico, 2013) frequently discussed. The result of this redistributive activity of the government was a further discouraging of the consolidation process. Finally, it affects the productivity and the efficiency of the use of technology – lowering the international competitiveness. On the contrary, in EU, the wealthiest countries received the major share of the subsidies, increasing the subsidies per bottle of wine to push the competitiveness of the European wine production. According to Anderson and Jensen (Anderson, K. and Jensen, H.G., 2016), the average subsidy per bottle of wine produced in the European Union member states is about 15% per bottle.

Also, concerning the subsidies, it is important to say that the other measures were taken on an ad hoc basis – making pressures on prices, attracting voters, etc. According to Benhabib and Przeworski (2006) (having in mind the difficult economic situation in the Republic of Macedonia), as the medians (specially, during recessions, after the global economic crisis, etc) are becoming poorer, the redistribution measures are getting stronger. Benhabib's and Przeworski's model could be named as a median-preferred model of redistribution. In order to understand the redistribution policy in the case of Macedonian wine producers, the general case could be described as a design of equilibrium redistribution that is fitting the preferences of the poor voters (the owners of the small plantations, in our case). Campante (2011) described it as the income effect – effects on the groups (groups of voters – small wine producers) who are more sensitive to, as Campante calls it, “generous transfers”. On the other side, the indirect obstacles to the processes of consolidation of plantations, could have a negative impact on ROA (Return on Assets), thus, contributing to the lower competitiveness of the Macedonian wineries on the international markets.

The issues for the wineries i.e. the wine industry in general, where twofold:

- Issues concerning requirements towards the government institutions (MAFWE) for increased financial support for wine export promotion that the wineries were unable to appropriately cover themselves.
- Issues concerning imposing stricter regulation on the sourcing side by the government (price of grapes and terms of trade), thus negatively affecting the interests of the wineries, based mainly on incomplete information and populist agenda of the government.

As Baron (Baron, 2010) suggests, any firm has a choice between forming a coalition or acting unilaterally to address an issue and if the issue could increase industry demand, the firms in the industry are in a similar situation and therefore such issues are best addressed at industry level through associations.

In April 2010, the leading export-oriented wineries decided to establish an association “Wines of Macedonia (WOM)”. The main objective of the newly created association was to accelerate the overall development of the Macedonian wine industry through exports but also there was a need for stronger representation in dealings with the government institutions.

Very important aspect of the establishment of the association WOM is that on the domestic market the founding wineries are all fierce competitors fighting for the share of the market, but the overall industry development and their individual growth depends mainly on accelerating their export performance. Thus, as Baron (Baron,2010) suggests, on many issues firms market rivals may be firm’s nonmarket allies, frequently working through a trade association to implement nonmarket strategies, which was proven by this case as well, as it will be explained in the text below.

Baron suggests the “4 I’s” concept for the analysis of nonmarket issues, which states that the nonmarket environment of a company is characterized by the “4 I’s”:

1. Issues as basic units of analysis,
2. Interests include individuals or groups with the stake in the issue,
3. Institutions provide arenas in which the interests influence the outcome on issues, and
4. Information pertains to what the interests and institutional officeholders know or believe about the issue and their development.

The “4 I’s” framework was widely accepted and frequently discussed becoming a kind of “classic” formula for understanding the subject, such as the concepts of “4 P’s” on marketing, SWOT and PEST in management, “5W’s” in event management, and so on. Some of the authors launched a number of inspiring modifications and novelties. Thus, Bach and Allen (2010) proposed a slight modification of Baron’s 4i`s-framework while maintaining the basic premise of his issue-anchored approach. Like Baron, their (ia3) framework suggests that managers begin with issues and then proceed to identify the actors with a stake in the issue, their interests, the arena in which the issue unfolds, the information actors need to prevail, and other critical assets they can bring.

Both frameworks can be applied across a wide range of issues, contexts and industries, where Bach and Allen (Bach and Allen,2010) contend that issues can be transformed over time through framing, and that firms as well as other nonmarket actors can frame strategically in order to shape issues to their advantage, while Baron (Baron, 2010) lays down the concept of the life cycle stating that the nonmarket issues can progress through five stages: (1) issue identification, (2) interest group formation, (3) legislation, (4) administration, and (5) enforcement.

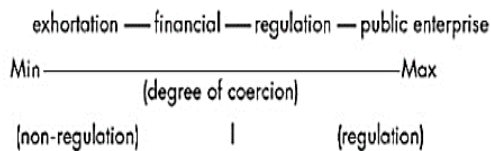
Baron presents the structured pluralism approach to the nonmarket analysis of a business. Basically, it is conducted a study of:

- Interests of firms, individuals, interest groups, and how they are transformed into nonmarket action, as one foundation of nonmarket analysis and,
- The characteristics of the government institutions (administrative and regulatory agencies, legislatures, international accords), where in public policy the nonmarket action is transformed into outcome, as the other foundation of nonmarket analysis.

Also, an aspect involving political competition of opposing interests in an institutional arena is being considered by David Baron (Baron ,2010), where the nature of political competition on an issue is a function of the concentration or dispersion of the benefits and the costs of the alternative and although it focuses on the nature and not the outcome, it provides a context for formulating strategies, referred to as The Wilson-Lowi matrix. Lowi (Lowi,1964) distinguished three types of policy differences: distributive, redistributive and regulatory. Lowi (1979) analyzed the clientelism networks, describing the cases of agencies being captured by the interest groups. Thus, business associations have to formulate their strategies including regular relations with the regulatory bodies.

Wilson (Wilson, 1980) differentiated the policy issues based on the criteria whether the benefits and costs of the policy are concentrated or dispersed in the area. But, this very well-known types of policies where a subject of critique from the point of view of the existence of different issues seeking for a single continuum of policy instruments (Howlett, 2010). Within the continuum of the instruments choices, the governments could promote the use of the most coercive instruments that are available or move toward the minimally coercive ones. The so-called “Doern continuum” (Doern and Phidd, 1983) is illustrated in the Figure below.

Figure 2. The Doern Continuum



Source: Hawlett, 2010.

So, the relative success of the business associations, such as WOM (www.winesofmacedonia.com), in making a pressure or dealing with the regulatory bodies for the interest of the wine producers, is framed with the character of the government and the society in general.

In the economic theory the most significant is the contribution of the Nobel laureate Gary Becker (Becker,1985). Becker formulated four theorems. The theorem 1 defines that the groups that are becoming more efficient in producing political pressure could

be able to decrease their taxes or increase their subventions. In the Corollary to the Theorem 1, Becker clarifies that the political efficiency of the group does not depend on its absolute efficiency (in controlling the opportunistic behavior of its members – in our case, of the members of WOM), but on its relative efficiency (compared with the efficiency of the other sectors associations, clubs and networks).

Furthermore, Baron (Baron, 2010) implies that frequently firms seek cover rather than visibility in their nonmarket environment so that their positioning is obscured from the view of the public, focusing on relationship building and lobbying. Going further, a firm has a choice between forming a coalition or acting unilaterally to address and issue. The former, as Baron explains, is the case if the firms in the industry are in similar situation and acting through a coalition will produce public good for all members. Moreover, for some firms, associations can also be a cost-effective means of achieving their interests, which they cannot pursue on their own.

Basically, according to Baron (Baron, 2010), we can distinguish between three generic nonmarket strategies, which are not mutually exclusive and can be used together to achieve synergies.

1. Representation strategies based on the consequence on constituents of government officeholders,
2. Majority building, focused on developing the needed votes in legislature,
3. Informational strategies, focused on providing information to government officeholders.

Baron 2010 stresses that lobbying as central component of most representation and informational strategies represents strategic communication of politically relevant information to government officeholders. Lobbying is being strategic in the sense of advocating one's position or countering the information provided by the other side.

Implementation of the nonmarket strategy: Results of the analyses

After the analysis of a nonmarket issue a strategy needs to be developed and implemented to tackle that issue, which Baron 2010 states that is the link between the objectives and the specific actions taken to achieve them, also considering the strategies of the other interests as well as the progress of the issue through the life cycle.

Considering the generic nonmarket strategies suggested and defined by Baron (Baron 2010), a representation strategy is based on the connection between elected officeholders and their constituents, as they are interested in serving them since they want to be re-elected, implying in our case a significant weight of the “Wines of Macedonia” association by the officeholders, as it ultimately represented and could have impacted a big population of grape growers and overall stakeholders of the wine industry.

Furthermore, analyzing WOM position and interest through the Wilson-Lowri matrix, it suggests predominant use of the interest group politics of the association, by lobbying and providing technical and political information to the Ministry of Agriculture, forestry and Water Economy (MAFWE).

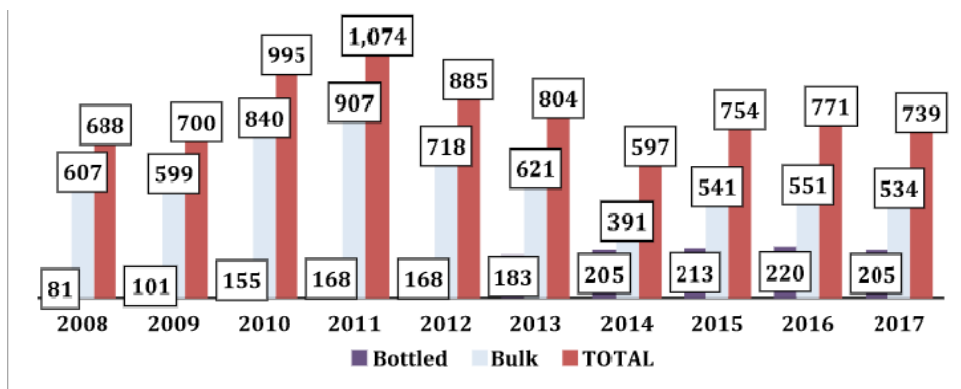
WOM annual report 2015 states that on the field, WOM was clearly recognized by the government institutions as the voice of the wine industry, which enabled relevant access to the policy makers, thus lobbying on the respective wine and grapes legislation, enabling protection of the interests of the wine industry by:

- Minimizing the negative effects of legislation for the wine industry (the right wing populist government with absolute power in all institutions was continuously imposing legislation on expense of the industry).
- Increasing the positive impact for the industry and its overall rent chain by providing competent know-how on the relevant fields i.e. informational strategies.

The informational strategies as suggested by Baron (Baron, 2010), are based on the superior information that an interest group has about consequences of alternatives for constituents.

In the case of WOM, the expertise of its members was translated in providing information and know-how in wine sales and marketing and the distribution of funds by the government to accelerate the industry performance of the bottled wine exports, which in turn will result in higher revenues and income for the wineries and respectively higher benefits for the 20.000 grape growing families including the wider base of all industry stakeholders.

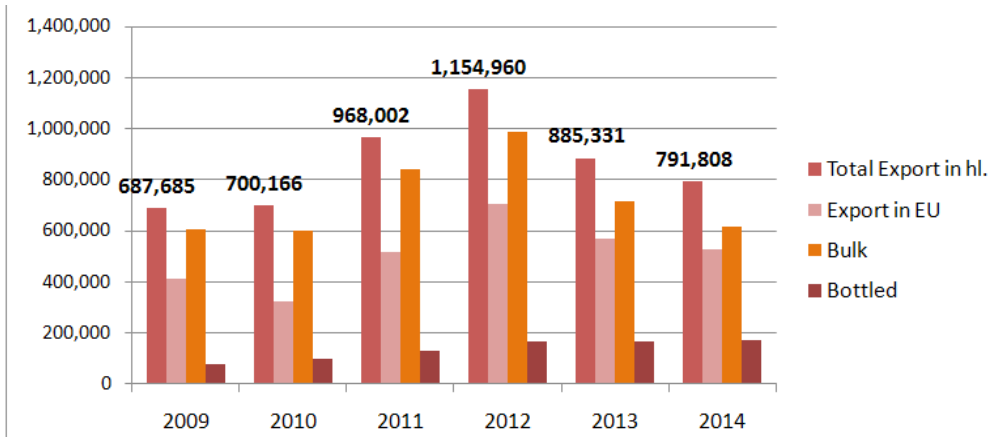
Figure 3. Wine export from Macedonia in 000hl



Source: Wine export, MAFWE, Dec.2017, Information on wine export per country, 2017

Before drawing conclusion from the presented nonmarket strategy of the Macedonian wine industry and its implementation, we must point out the actual results against the initially set targets of WOM to act as an industry voice in the dealings with the government bodies and increase the bottled wine exports, especially considering its relevance and overall importance as described in the previous pages. Therefore, we will look into two key performance indicators of WOM, the bottled wine exports and the obtained third-party funding for its promotional activities, presented in the figures below.

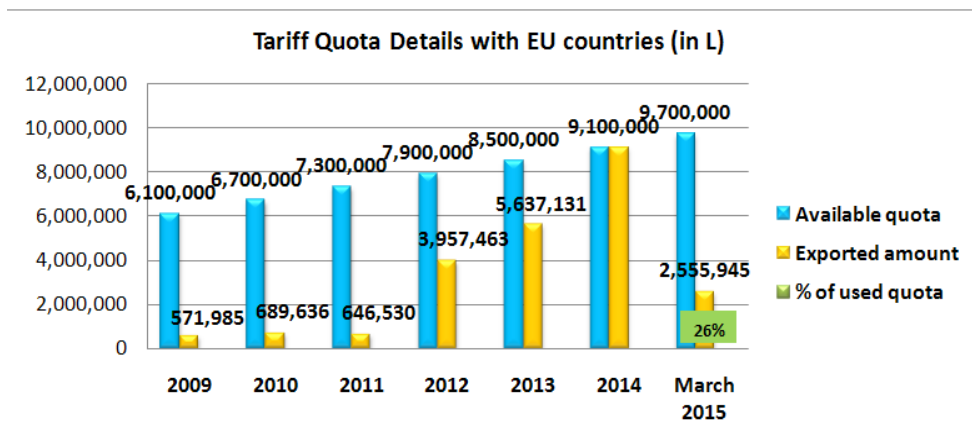
Figure 4. Total wine export per year



Source: State Statistical Office of the Republic of Macedonia, Wine in figures (http://www.stat.gov.mk/ZaVinoTo_en.aspx), reviewed on 10.06.2016.

For the overall results, it is important to point that the share of the domestic, Macedonian, market, in wine sales is just 15%.

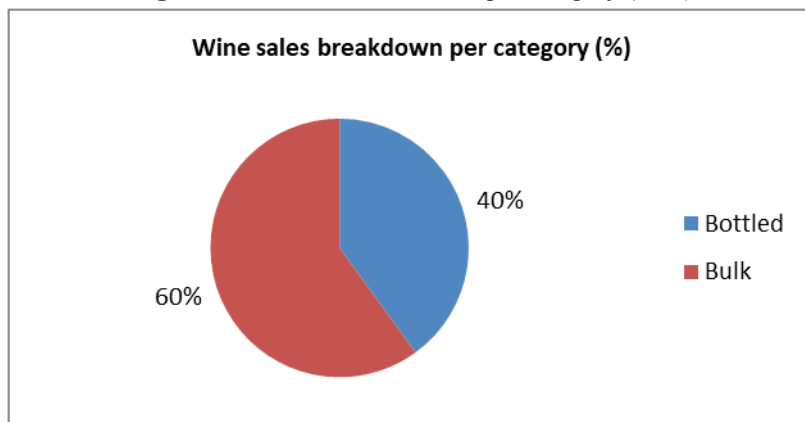
Figure 5. Export of bottled wine from Macedonia



Source: Taxation and customs union, Tariff quota details (http://ec.europa.eu/taxation_customs/dds2/taric/quota_tariff_details.jsp?Lang=en&QuotaAuthorities=false&StartDate=2015-01-01&ContextPath=&Code=091558), reviewed on 08.07.2016.

The data from the MAFWE annual report, shows that beside the volatile and unpredictable evolution of the bulk wine exports, the bottled wine exports increased more than 2,5 times in the observed period, from 81.000 hl in 2008 to 213.000 hl in 2015, clearly reflecting the overall efforts, including WOM role in achieving these results.

According to WoM (www.winesofmacedonia.mk/key-figures/), still 60% of the production is sold in bulk, and only 40% are products of bottled wine.

Figure 6. Wine sales breakdown per category (in %)

Source: Own estimation based on WoM figures

In addition to the individual funding by the wineries and their respective capabilities in the marketplace, WOM strategy in the nonmarket environment i.e. the MAFWE institutional arena, competed with various interest groups, mainly food producing associations, farmers unions and trade associations. As we can see from the figures below, WOM managed to provide sustainable funding for its activities, competing successfully, for the funding of its export promotions.

Table 2. Financial support for wine export promotional activities

WOM export promo activities funding	2011	2012	2013	2014	2015
CBI (Dutch promotional agency)	30.000	40.000	50.000	50.000	65.000
MAFWE (Ministry of agriculture)	0	0	125.000	200.000	225.000
TOTAL in EUR	30.000	40.000	175.000	250.000	290.000

Source: WOM Annual Report 2015, pp 4-6

WOM, despite the initial slow start with the MAFWE in terms of building credibility and initial providing of information, in the years ahead clearly managed to secure sustainable funding of the export promotional activities, proving successful implementation of its nonmarket strategy. Analyzing the experiences of the Italian wine industry, one of the most advanced in the world, Odorici and Corrado (Odorici and Corrado, 2004), from the University of Bologna, pointed the importance of the intermediaries, on one side (still not of such an importance in the wine sector of Macedonia) and the associations and social networks. The role of the intermediaries is growing (from publishing wine guides to doing rankings), but the social networks and associations, such as WOM, could successfully manage the relations between the wine producers and the intermediaries. Having this perspective, WOM is expected to play a significant role (together with the growing importance of the intermediaries) in designing the generic framework of

comparability. WOM could be concerned as a kind of the instrument that is increasing the social capital of its members, but also of the community. According to Van Shaik (Van Shaik,2002), participation in professional association could be understood as one of the dimensions of social capital. It is important to refer to Putnam`s (Putnam,2000) dichotomy of social capital. Namely, Putnam is distinguishing the so-called bonding and bridging social capital. The former could produce some negative impacts on the society (finally, to its members). Following this theoretical approach from the social capital theory, WOM members have to be aware of the problem and create their strong relations with the other players on the business and political markets.

As we can conclude from the analysis of the nonmarket strategy of the main players in the wine industry of Republic of Macedonia as well as the presented results against the main objectives, the establishment of the trade association “Wines Of Macedonia” contributed to the rapid development of the bottled wine exports supported by the relevant government institutions and foreign support organizations benefiting the wine producers performance at first, but also having even further positive impact on all industry stakeholders.

Conclusions

The wine production sector is becoming one of the fast-growing industries in Macedonia, producing very significant effects on GDP, employment, and export results. Wine industry representatives are facing a number of challenges coming from the nonmarket environment: from political and governmental bodies, legislation, and regulatory environment. Being aware that some company could have a good market results and in the same time not always ready to face the impacts coming from the nonmarket environment, the new association, WOM, has been created. The framework of the analyses was given in the Baron`s book on business and its environment.

The practical results, achieved in the last few years are positive. Although the number of the members in the association is not large (ten companies out of total of 84companies), they represent all the leaders on the wine market. Possible enlargement of the WOM could lower the marginal deadweight costs (according to Becker) of subsidies and taxes. The WOM members have to follow Becker`s approach in analyzing the impact of deadweight costs on pressure, subsidies and taxes. Deadweight cost discourages pressure by the subsidized groups, and, vice versa, the groups of taxpayers are strengthening the pressure (Becker, 1983).

The role of WOM and the players on the nonmarket environment must be reconsidered from the international point of view. The domestic market is highly competitive, too. Besides the fact that almost 60% of the bottled wine from Macedonia is exported on the EU market, it is important to have in mind that from all export to EU, more than 81% of the bottled wine goes to the markets of Croatia and Slovenia. As the tradition of Macedonian wines in ex-Yugoslav countries is very long, it means, in fact, that the wine producers have to make stronger promotional efforts to enter other markets of

the globalized world (Hussein et al, 2007). Knowing that the customs tariffs do not make any more so strong barriers in protecting the markets, it means that WOM and other players have to face the growing non-customs protectionist measures or know the characteristics of different nonmarket environments of the potential markets, even the changes emerging with the Internet trade (Wiseman, 2004). The wine market reflects the asymmetry (Kobrin, 2015) that exists between the integrated international economy and the fragmented nonmarket environment.

As it is shown via documentary evidence from France, Italy, Romania and Spain (Itcaina et al, 2016), the growers have to face the demand on the global market. For Macedonian (and other producers in the Region), it could be very important to study the changes in the EU's regulation of the wine, especially after 2008, turning from the supply-driven to demand-driven measures. It has to be aware of the long-standing process of regulatory changes in Europe (Gaeta and Corsinovi, 2014), lasting half a century (with major changes in adopted in 2008) with the intention of reducing the redistributive role. Besides the fact that even the EU market could not be considered as a pure "monolith market" (Mitchell, 2016) the general trends in supporting wine production could be observed. The focus of the interventions passed from reducing subsidies for vine growing and distillation to so-called "microeconomic support" offered to wine manufacturers and recognized wine regions. This experience could mark the future activity of WoM members. Finally, the WOM Association has to communicate with other player in the nonmarket environment in order to avoid the trap of the bonding social capital creation.

Conflict of interests

The authors declare no conflict of interest.

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ASSESSING SUSTAINABILITY OF THE SOUTHEAST EUROPEAN ECONOMIES

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ABSTRACT

Sustainable development is development that meets the needs of the present, without compromising the ability of future generations to meet their own needs. Sustainability indicators are based on the attempt to measure or determine the path of development of the economy in two directions: sustaining human wellbeing, or preserving the capacity to provide wellbeing. The research has been conducted to assess sustainability in the Southeast Europe, represented with a group of 10 countries with the 15 multi-metric indicators. A cluster analysis was performed on the set of indices to check the formation of distinctive clusters. Albania, Bosnia and Herzegovina, Macedonia, Montenegro and Serbia constitute first cluster, proving small differences among data. Second cluster consists of Bulgaria, Croatia and Romania, while last cluster consists of only Greece and Slovenia.

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Introduction

Humanity is experiencing an unprecedented transformation of economic and social system, predominantly driven by exponential population growth and overconsumption of resources, enhanced by an increased demand for improved social conditions. Current problems are seen as an undisputed requirement for more sustainable socio economic system that is seen in the form of the sustainable development concept. The concept of sustainability is comprehensible and is therefore a great obstacle to creating an adequate sustainability indicator. Encompassing the complex reality, with simultaneous careful and consistent implementation of mathematical or statistical models, for the purpose of calculating the deviation of the current state from desired reality, is an extremely difficult task for contemporary researchers. On the other hand, using the available indicators of sustainable development and their use for the purpose of decision making entails

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the danger of oversight and uncritical belief in results that are a more than simplified picture of reality and can be based on an insufficient number of data. Furthermore, individual indicators may favor some of the aspects of sustainability, at the expense of others that are absent or insufficiently present in the composite index itself. Thus, it can be argued whether it is reasonable at all to use any single composite index represented by one number. Should one turn to the multitude of individual indicators of the state of economy, environment and social progress and tailor individually acceptable trajectories of future development based on such lists?

Theoretical Framework for Sustainability Research

Sustainable development represents a normative orientation providing a reference framework for juxtaposing different perceptions, pursuits and understanding of authors regarding the desired changes in the society (Loorbach, Frantzeskaki, and Thissen 2011). At the same time, defining sustainability features as one of the favorite pastimes of the academic community (Kula 2001). It is a fact that there are an extremely large number of definitions of this concept, and this number is probably equal to the number of groups trying to precisely express the notion. More serious attempts at defining the notion and concept date to the late 1980s and more significant definitions, that is, those that have established themselves in academic papers, have distinguished themselves to date. Explaining the notion of sustainability, it could be concluded that the term refers to something that is preserved, protected or managed, whereas development is explained by progress or improvement (Bojović 2011).

As for the concept itself, the most often cited definition is that mankind has the possibility to make development sustainable – to enable development that meets the needs of present, without depriving the future generations of the possibility to meet their own needs (World Commission on Environment and Development 1987). In other words, sustainable development is seen as a harmonious relationship between economy and ecology, so as to preserve the natural resources of our planet for the future generations as well. Initiating the idea of the possibilities of achieving a more stable, technologically more advanced, socially balanced and humane society, in accordance with environmental principles (Đukić 2014) is the objective of contemporary economies oriented towards sustainable development.

Although the definition accentuates the long-term pursuits and ethical aspects of the concept, it does not give clear indications of the necessity to establish sustainable environment, a society based on justice and equality, nor a healthy economy. A more precise definition of sustainable development could therefore be required, which will include these essential dimensions. Sustainable development encompasses the types of economic and social development, protecting and fostering natural environment and social equality (Danphy 2000), from which it clearly follows that sustainable development, is to be regarded as a process of continuous enhancement and flexibility.

The concept of sustainable development raised the debate between advocates of development and advocates of environmental protection proposing either a divorce between the two trends based on establishing prosperity without growth (Jackson, 2010) or a successful marriage with the adherents of new green consensus (Frantzeskaki, Jhagroee and Howlett 2016) .

Taking into consideration standpoint from the aspect of dedication to the growing problems of social welfare and equality and the aspect of environmental problems, the existing paths of understanding sustainable development can be grouped to: adherents of status quo, reformers and transformers (Hopwood, Mellor and O'Brien 2005). The adherents of status quo appreciate the need for change, yet do not perceive insurmountable problems neither on the side of the environment, nor from the aspect of society. The adherents of this path of sustainable development believe that adjustments can be made by means of appropriate decisions and agreements and represent the prevailing opinion of current politicians and influential governmental and non-governmental organizations such as the European Union, the World Bank, the Organization for Economic Cooperation and Development (OECD), the World Business Council for Sustainable Development (WBCSD) etc. On this standpoint, development is implied as a consequence of economic growth, while progressive taxation, reduction in salaries and benefits, privatization and deregulation are regarded as desirable.

The second group of participants in the debate on sustainable development are reformers, who agree that there are serious, accumulated problems, which are the consequence of the current approach to governance and leadership, although do not believe that consequences can be detrimental, nor that fundamental changes are necessary (Meadows 1972). Rather than in the current social system, they find the root of the problem in inequalities and lack of knowledge and information. They also agree that obvious changes are necessary in state policies and lifestyle in a time period, but argue that this can be achieved by gradual changes within the current social and economic structures. The starting point is the belief that technology may contribute to the environmental protection and it is necessary to increase energy efficiency, that is, opt for alternative energy sources.

The last group of participants in the debate on sustainable development, the transformers, advocate deeper changes in the current system so as to respond appropriately to the accumulated problems of society and environment. This group includes numerous influential players advocating reforms without close connection with sustainable development, such as numerous socialist ideas dedicated to the issue of change of the social system, but also players of deep ecology and ecofascism, focussing natural values that should be placed before the interest of people.

Mere pointing to the shortcomings of the current model is much easier than proposing a new model. The current economic model can be criticized because it fails to fulfill the objectives of sustainability in the following aspects (Islam, 2014):

- Excessive consumption and exploitation of natural wealth;
- Inefficient and inappropriate in accomplishing development objectives oriented to poverty eradication;
- Utterly helpless in environmental protection, in the sense of simultaneous and sufficiently rapid increase of the standard of living of the vulnerable, and improvement of life satisfaction of those who already have the prerequisites.

There are opinions that the current obvious problems are not a consequence of recent events, but can be viewed as a cumulative process that started with the industrial revolution that resulted in enormous economic growth, which is not sustainable. One of the direct consequences of industrial revolution is submission of society to economy guided by personal interests. It is therefore necessary to return economy within the framework of society and thus substitute personal interest with social welfare as the basic motive of the economy. Aided by the commodity concept, the market mechanism subordinates man and nature, that is, the very essence of society, to the laws of market (Polanyi 2001, p. 45). Although this new version of the market turned out to be extremely productive, it is accompanied by disastrous displacement of man, tearing his links and endangering the natural habitat, with the threat of destruction. The solution to the problem lies in re-establishing the control of society over economy, demolishing the commodity-based approach to work, land and money, and reinstating them in the form of people, nature and means of exchange (Polanyi 2001), which also represents a new model suited to the concept of sustainable development.

Whichever orientation they belong to, all authors will represent sustainability as something good and desirable for any society. The sustainability concept itself has become like democracy, in the sense of universally desirable, diversely understood, extremely difficult to apply and unceasing concept (Lafferty 2004). Some, however, argue that the concept has become so convoluted and complex that it can no longer feature as a guideline in a decision making, and therefore places itself in danger of becoming irrelevant (Holden, Linnerud and Banister 2014).

Adopting a broader framework of socially responsible criteria in the research work itself, such as: a stronger reflection of ethical issues or social influences on research can make a favorable impact on science devoted to sustainable development, encompassing transdisciplinary and interdisciplinary research (Daedlow et al. 2016).

Assessing sustainability in the Southeast Europe

Sustainability is a broad concept, attractive for policy makers and researchers alike, which has led to the overwhelming number of indicators for assessing sustainability. Indicators are intended to be a useful tool for policy making as they convey information about the country's performance regarding specific aspect of sustainability or encompassing all three dimensions: economic, environmental and social.

Sustainable development is dedicated to the complex problems of present, stemming from the attempts to harmonize the frequently conflicting demands of human development, environmental protection and maintaining the possibilities of future generation. Initiating the idea of the possibilities of a more stable, technologically more advanced, socially balanced and humane society that is, additionally, in compliance with environmental principles, is the objective of contemporary economies orientated to sustainable development. Although consensus, in principle, has been reached in theory, in practice it is extremely difficult to encompass all three aspects of sustainability in a single indicator. Therefore, a serious analysis of sustainability of economies requires analysis according to multiple criteria and thus expression through multiple scientifically founded indicators, implying, above all, a high-quality database.

Individual sustainability indicators have gained popularity owing to clear presentation of conclusions or easy comprehension of results, whereas others are appealing because they accentuate a certain social aspect of development. Despite being accepted as representatives of sustainable development indicators, these are only a partial reflection of the complex issue of sustainable development and must be supplemented, adjusted or serve as a basis for creating complex indicators. When the creation of complex, all-embracing indices is attempted respecting the scientific basis of aggregation, the problem remains of (non)existence and allocating weights to individual parameters, which entails subjective judgment.

Assessing sustainability has been a daunting task even for developed countries, and for developing countries it is especially delicate process. Burdened with economic and social challenges developing countries are neglecting their natural resources and this is generally the predominant reason why these countries are struggling with sustainability progress. Countries of Southeast Europe are no exception. Representing a group of 10 countries, with five countries currently in the European Union (Bulgaria, Croatia, Greece, Romania and Slovenia), four candidate countries (Albania, The former Yugoslav Republic of Macedonia, Montenegro and Serbia) and one being potential candidate country (Bosnia and Herzegovina), this group has been chosen to represent developing countries and their obstacles in assessing sustainability. Cluster analysis proves to be the most suitable analysis, as it allows for a large set of indicators to be employed and gives sound information as to how the economies have grouped according to their sustainability levels.

Data and methodology

The 15 multi-metric indicators are chosen to represent development of Southeast European economies in the light of sustainability. Four essential development indices are presented: population, GDP growth, GDP per capita and minimal wage as to give the perspective of the economic advancement of the economies. Afterwards, 15 indicators are chosen: adjusted net savings (ANS), corruption perception index (CPI), ecological footprint (EF), education index (EI), environmental performance index (EPI), environmental vulnerability index (EVI), GINI coefficient, global peace index

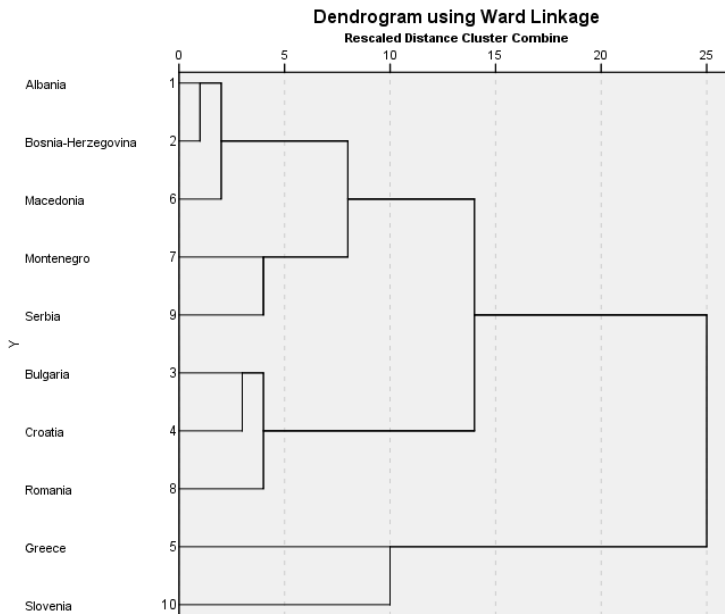
(GPI), human development index (HDI), inclusive wealth (IW), poverty gap, rule of law index (RLI), social progress indicator (SPI), sustainable society index (SSI), world giving index (WGI). Indicators are chosen primarily to cover all three dimensions of sustainability (economic welfare, social equity and environmental quality) fairly equally such as: ANS, SPI, SSI and IW. Others are important in policy making and are representing inevitable sustainability indices being in a constant use.

Effort has been made to represent the most recent data available using accessible databases (WB - The World Bank, eurostat - European Statistics, Transparency International, Global Footprint Network, United Nations Development Programme, Yale University, United Nations Environmental Programme, Institute for Economics and Peace, International Human Dimensions Programme (UNU-IHDP, 2014), The World Justice Project, Social Progress Imperative, Sustainable Society Foundation and Charities Aid Foundation, 2016). Presented indicators are mostly composite indicators, comprising from two (EI) to up to 62 (SPI) different individual indicators, usually gathered in sub-indices (ANS, EVI, WI, SPI, SSI), representing great power of conveying information with one gauge or number. Contrary to composite indexes sole indicators like poverty gap or GINI coefficient are used to accent depth of poverty or income distribution inequalities and are used together with one or several composite indicators.

Indices are presented with the metadata on different scales that required prior standardization of the variables. A cluster analysis was performed on the set of indices to check the formation of distinctive clusters. The squared Euclidean distance between samples was used to assess the similarity or differences, thereby forming clusters of integrated sustainability performance based upon the 15 multi-metric indicators. A dendrogram was used to visually depict the clusters created via the hierarchical method. The final partition of the clusters was determined using dendrogram and the knee in the similarity level of the clusters analysis. The selection of the final number of the clusters was dependent upon subjective interpretability of the solution (Odigie et al. 2017).

Results and Discussion

From the analysis it was concluded that all the data clusters finely in three groups. Albania, Bosnia and Herzegovina, Macedonia, Montenegro and Serbia constitute first cluster, proving small differences among data. Second cluster consists of Bulgaria, Croatia and Romania, while last cluster consists of only Greece and Slovenia. The results are presented with Figure 1.

Figure 1. Cluster Analysis results

From the analysis it is evident that the closest results concerning sustainability are among Albania and Bosnia and Herzegovina, followed by Macedonia. Similar results in sustainability assessments are between Bulgaria and Croatia. The rest of groupings were not based on that close results.

First cluster is somewhat heterogeneous, as it comprises of three similarly performing countries (Albania, Bosnia and Herzegovina and Macedonia) and two slightly off, being Montenegro and Serbia. Those differences are not statistically significant, however. The common denominator for these countries is that they are candidate countries and potential candidate countries. Understanding overwhelming issues for the single country is possible by searching for commonalities among sustainability performance.

The Former Yugoslav Republic of Macedonia is having difficulties combating corruption and maintaining peace in the society with great income disparities. The conclusion is imposed by the results of the considerably lower rank in GPI and CPI indexes, followed by the highest GINI coefficient in the Southeast Europe. Currently challenging issues in FYRO Macedonia are additionally validated by poorest score in SSI in human dimension.

Other Southeast European countries do not have such a clear cut combating issues. Albania has scored poorly in education that is directly transferred to poor HDI value and is recording weak economic parameters, such as the lowest GDP per capita, lowest minimal wage, low scores on economic dimension of SSI, and high perceived corruption. It could be said that Albania has the greatest obstacle in sustainability reflected in poor economic base.

Bosnia and Herzegovina, besides poor scores on human side, visible in low HDI score followed by poor score in corruption perception index, has serious problems with environment protection as it performed considerably worse than other Southeast European countries in SSI environment dimension that is proven in EPI, leaving only 71 world country out of 178 behind.

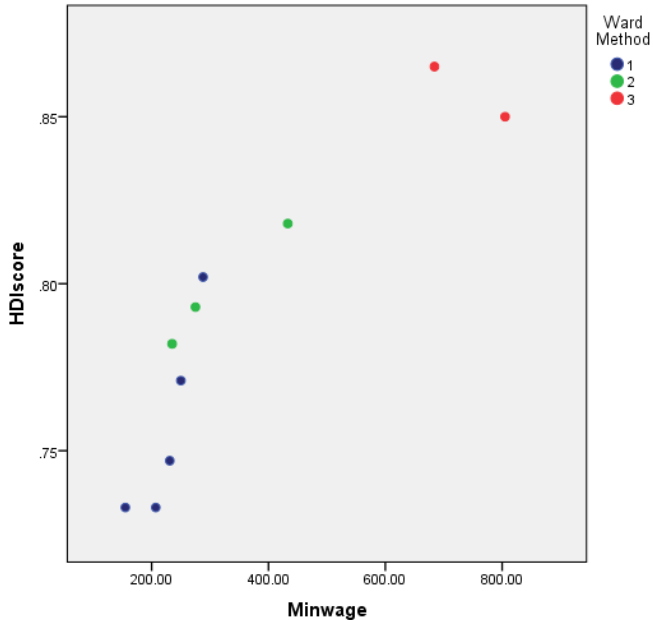
Montenegro and Serbia are the closest to the group of weakest performers in the Southeast Europe, and that is why they are in the same cluster. Montenegro and Serbia, with common political heritage are performing almost the same in most aspects of sustainability. The only difference is Serbia's slight lag in terms of combating corruption and slower economic growth compared to all analyzed countries.

Second cluster denotes the results of 3 EU member states (Bulgaria, Croatia and Romania). No single country stands out to be performing significantly worse than any other, except Romania concerning the poverty depth (poverty gap indicator). Bulgaria, Croatia and Romania are performing in all aspects moderately compared to others. Similarity is the superior economic performance of these countries, visible in considerably higher GDP growth rates and the highest scores in SSI economic dimension, while the difference is Romania's issues with deep poverty index, and Bulgaria's good peace performance.

Third cluster is made from Greece and Slovenia although those two could be considered separately, as the difference in the results is considerable. Slovenia stands out in numerous progress indicators, such as: education index, EPI, GPI, GINI, WGI, CPI and IW outperforming other Southeast European countries and it could be attributed to the higher standard of living - minimal wage indicator and GDP per capita are 5 times higher than in Albania, while general peaceful conditions in the country facilitate stable macroeconomic environment, unlike Greece or FYRO Macedonia.

Greece is combating economic issues, as the GDP growth is close to 0 that is visible in the lowest score of SSI economic dimension of all Southeast European countries. Aggravating poor economic conditions is the fact that Greece has high GPI and high poverty gap ratio that will make it more difficult for Greece to enable fair and equal possibilities for all its citizens. Although social and human dimension of its progress is valued highly, with almost highest education index and HDI, the inability to manage its natural resources soundly is visible (second lowest ANS, and EF bio capacity debt).

The good visual representation of the sustainability analysis of Southeast European countries is provided with figure 2, where HDI score, as a representative of social development, and minimal wage, as a representative of economic advancement, are crossed at scatter plot. It is evident that countries from the first cluster are distant from countries forming third cluster by far. Those two indices are portraying vividly socio-economic environment of Southeast European countries.

Figure 2. Scatter plot of three clusters for HDI score and minimal wage

Conclusions

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Keeping in mind the possibilities of generations to come and responsibility of present generations to facilitate this ability it is essential to manage wisely all capital at hand, i.e.: natural, human and financial. Assessment of the sustainability advancement of the Southeast European countries has shown the difference of their individual socio-economic environment. All countries are dealing with its specific economic problems differently. However, it influences the advancement of social and environmental dimension of sustainability. The economic growth and prosperity enables the advancement of the second two aspects. Said differently, the economic development is either the enabler or the impediment of social and then eventually environmental advancement.

This paper has shown the clustering of Southeast European countries according to the sustainability progress, capturing most proficient and up to date indices of sustainability at the same time.

Conflict of interests

The authors declare no conflict of interest.

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SOLUTION OF GENERAL AND PREVENTION OF ECOLOGICAL PROBLEMS OF STARA PLANINA MOUNTAIN AS POTENTIAL OBSTACLES TO THE DEVELOPMENT OF RURAL TOURISM

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ABSTRACT

The development of rural tourism positively affects the economic development of rural communities, but the very pace of its development often results in negative effects on the environment. Uncontrolled rural tourism development, without an adequate planning system, can greatly endanger the entire ecosystem of a destination. The aim of this paper is to determine how much the development of rural tourism on Stara Planina Mountain depends on the solution of general and prevention of ecological problems. A method that allows the cause-effect relationships between these phenomena is a linear regression analysis. This analysis best describes the quantitative dependence between the variations of the observed phenomena in real conditions. It represents the means that enable us to evaluate and predict the values of the dependent variable for the desired values of the explanatory variable. In other words, the main issue is rural tourism on Stara Planina Mountain, which depends on the solution of general and prevention of environmental problems.

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Introduction

The main resource of rural tourism development is natural environment. It is estimated that more than half of the total tourist demand in the world is directed towards natural wealth and areas of untouched nature.

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In the last few decades, rural tourism has been followed by many unwanted consequences, mostly ecological ones. An uncontrolled development of rural tourism without an adequate planning system can significantly jeopardize the entire ecosystem of a destination. Inadequate disposal of waste during tourist activities can lead to contamination of soil and water. Also, the development of rural tourism leads to increased traffic, which inevitably affects pollutant emissions, increases the greenhouse effect, noise, but also energy consumption.

Although the modern world is confronted with responsibility and awareness that the planet must be preserved for the present and future generations, it is necessary to reconcile the needs of people with the preservation of nature. The obligation of today's generations is to leave to the posterity the best chance possible to live and survive. Therefore, the need for implementation of measures aimed at reducing the wasteful consumption of resources, increasing productivity with maximum respect to the environment and implementation of environmental policy is imposed (Kostić et al., 2014).

Stara Planina has huge natural potential for tourism development. It has very rich biological, geological and cultural heritage. Considering the fact that it mostly extends along the border belt with neighboring Bulgaria, Stara Planina has not yet developed as a tourist attraction of Serbia. This fact has mostly enabled the preservation of its natural and social characteristics (Stankov et al., 2010). Natural beauties of Stara Planina, in combination with culture, tradition, gastronomic specialties and music of Eastern Serbia, can become a recognizable tourist brand that would improve the image of the region and the entire state (Maksimović et al., 2015b). In the development of rural tourism, special attention should be paid to the protection of the environment and its resources. Also, we have to emphasize the importance of responsible business activities, which should be conducted in cooperation with local authorities and with the residents in order to meet local needs and create the benefits for them.

Literature review

Tourist destination of Stara Planina, as stated by Nikolić et al. (2015), is an attractive area with great perspective for entering the world tourist scene.

In the last few decades, rural tourism, as well as commercial tourism, has been followed by many environmental, social and cultural unwanted consequences, and hence there was created the need to frame these activities by the concepts of sustainable development. The modern world is responsible for saving the planet for present and future generations, and therefore it is an imperative to harmonize the needs of people with the preservation of nature. It is the obligation of today's generations to leave to the posterity at least what they had. Present generations can claim resources and healthy living, but they should not jeopardize the same right for the generations to come (Marković & Pejanović, 2012; Jovičić, 2002).

Sustainable tourism represents an economic branch that has a minimal impact on the local culture and the environment. At the same time, it enables new jobs, the

adequate salaries, and the protection of the ecosystems. There is no unique definition of sustainable rural tourism development. However, we could say that the sustainable development of rural tourism means the respect of the general principles of sustainable development and ethics, which applies to all the participants in the tourism process. Although the concern for sustainable development represents the basis for modern planning and management of tourist destinations, the question is how much it is applied in practice (Ruhanan, 2012).

Sustainable rural tourism development, based on an integrated approach, implies equally emphasis on the following components (Jovičić, 2000):

- Preservation of the environment,
- Affirmation of social integrity,
- Cultivating cultural characteristics of the local population,
- Optimally meeting the tourist needs,
- Making economic profit.

The basis for the mentioned activity is certainly the quality of the environment, the social integrity and the cultural identity of the rural areas. Respect of the sustainable development concept represents a great contribution to their affirmation. It enables economic profit and meeting the needs of tourists. Bearing in mind the mentioned facts, we could even say that sustainable rural tourism represents an integral and complex development of tourism that simultaneously ensures the achievement of heterogeneous goals, where none of them should be dominant in relation to others (Jovičić, 2000).

The basic dimensions of tourism sustainability are as followed:

- Ecological sustainability – the development of tourism does not cause irreversible changes in the ecosystem of the destination. It is the most widely accepted dimension since there is a clear need around the world to protect natural resources from the negative impact of tourism activities.
- Social sustainability – the ability of the local community to accept tourism (both the tourism industry and the tourists themselves) without creating social discord.
- Cultural sustainability – a particular local community is able to retain (preserve) or adjust its own characteristic cultural line despite the pressure of the so-called “tourist culture” of visitors.
- Economic sustainability – the level of economic profit from tourism that is sufficient to provide a certain income for the local community and to cover all the costs of the specific measures taken in order to satisfy tourists’ needs (even though the prerequisite for economic sustainability is the attractiveness of a particular area and the understanding the importance of a high quality service; a destination cannot be economically viable without the competitive position on the world market) (Popesku, 2002).

Negative effects of the tourism activities that can jeopardize ecological sustainability are as followed:

- air pollution,
- water pollution,
- noise,
- different electromagnetic radiations etc.

One of the consequences of the environmental pollution caused by tourism activities is diseases, which represent the most difficult form of deterioration of the life quality. According to Mladenović (2015), the modern human population is concerned about the safety of air, drinking water and food, but also about materials that can represent the risk for health (Mladenović, 2015). Toxic substances in air and food can cause a variety of health disorders for humans and animals, from the change of biochemical and physiological status to reproductive and pathological changes, and in extreme cases they cause death. Given that the presence of contaminants is an inevitable characteristic of the environment, the risks they bring can be limited, but not completely eliminated.

The ecological aspect of sustainable development, according to Miletić et al. (2015), brings great changes in an ecological system that encompasses the ecosystem integrity and concern for it. This is, in fact, the protection of the environment, which means that sustainable development can be realized smoothly with the constant development of environmental awareness. Sustainable development through this dimension includes the care for the preservation of water, air and soil quality, preservation of flora, fauna and human health, which is the main condition for sustainable business (Miletić et al., 2015).

Rural tourism can also be useful for ecological sustainability, as it can be the reason for the protection and preservation of natural habitats and wildlife, precisely because of their value as a tourist resource. It also increases tourist awareness about environmental issues, provides new and upgrades the existing infrastructure. In this way, it can become a source of additional income for agricultural producers.

According to Kalač (2013), the number of tourists included in this type of tourism is growing and increasing in all rural areas. In order to attract tourists in these areas (with a goal to create additional income, among other things), it is necessary for farmers and villagers to offer a wide range of activities and services. Adoption of this concept of rural tourism includes not only tourism in rural households or agritourism, but also breaks in nature, excursions to rural areas and longer staying (Kalač, 2013).

Gašić et al. (2015) state that the development of tourism in rural areas aims to solve a number of economic issues related to the depopulation caused by migration of inhabitants to urban regions. Improving life conditions and environmental protection increase the stability of the working-age population, which enables migration in the opposite direction, from urban to rural zones. Such activities contribute to the economic development of rural areas and have an impact on future development of the economy of the whole region (Gašić et al, 2015).

The main economic significance of this type of tourism lies in the tourists' purchases in the areas they visit, because apart from accommodation services, there are also events, festivals, recreation, production and sale of handicrafts and agricultural products. For this reason tourist demand is increasingly seeking to avoid tourist destinations oriented toward one place. It aims to return to the traditional and typical values and authenticity, where they can find new tourist products with new environmental, natural and social parameters (Sanagustín Fons et al., 2011). Therefore, the money that tourists earn in their own countries they spend in a particular tourist destinations. In this way, it is being created certain economic effect on the economy, both in the areas from which tourists come and in the areas they visit (Unković and Zečević, 2006).

Money that tourists spend has direct and indirect effects on the economy of local areas. Some of the most important impacts of rural tourism on the economy are as follows (Maksimović et al, 2015a):

- Impact on GDP and national income;
- Impact on the development of activities that belong to the tourist economy;
- Impact on the balance of payment of a country;
- Impact on the employment and life standard;
- Impact on the investment activities and the structure of investments;
- Impact on faster development of poorly developed countries and areas.

Beside the direct impacts on the economy, the indirect impacts of rural tourism deserve considerable attention. Money that tourists spend is directly linked to the activities of tourist industry, and it, to some extent, affects all economic and non-economic activities. This creates new jobs that automatically reduce unemployment, which has been identified as one of the most important benefits of rural tourism (Inskeep, 1991).

In order to achieve economic goals, we should strive to provide quality services, as this ensures optimal satisfaction of the domestic and foreign tourists' needs. On the other hand, meeting the tourists' needs leads to the realization of favorable economic results of all participants in the business process (Muhi, 2013).

In 2002 in Johannesburg, Serbia presented tourism as an example of sustainable development; in other words, it was presented tourism based on the concept of sustainable development (Živković, 2013). According to Živković, the aim of the program is to develop a legal and political framework to support rural economy diversification through tourism and contribute to the achievement of the millennium development goals at the national level, that is to improve connectivity and organization of rural tourism by improving the capacity of local service providers, as well as local production in line with national strategy. Key activities aimed at achieving goals are as follows (Živković, 2013):

- Development of the National Master Plan for the development of rural tourism and the national program for rural development;
- Providing guidelines for public investments with the aim to create national and international partnerships between the public, civil and state sectors;
- Strengthening capacities of entrepreneurs in rural tourism, as well as capacities of tourist organizations and citizens' associations;
- Promotion of an innovative approach to the development through local agency groups and tourist organizations, as well as providing special support to local projects through a joint UN programs for sustainable tourism and rural development.

Considering that the goal of each tourist destination in modern tourism is to create a unique identity (a difference in relation to competition), precisely this fact will be the basis for growth and development of the tourist destination of Stara Planina in the competitive market (Gašić et al., 2013).

Materials and methods

The aim of this paper is to determine how much the development of rural tourism of Stara Planina depends on solving general and preventing environmental problems. The research was carried out on the territory of the local communities of Eastern Serbia, in the region of Stara Planina, in the period from April 15th until May 15th, 2017. Survey questionnaires were used as a research tool and the number of validly filled questionnaires was 300. The research was anonymous.

As the greatest problems of Stara Planina we have identified:

- Poor road connection
- Local population unemployment
- Aging population
- Low income at the local level
- Ecological problems

As the greatest ecological problems of Stara Planina we have identified:

- Waste water
- Communal waste
- Traffic pollution
- Industrial pollution

This research initiated from the basic hypothesis:

“Solving general and preventing ecological problems on Stara Planina Mountain will significantly improve the development of rural tourism.”

A five-point Likert scale was applied to the gradation of the received responses, and data processing was carried out through the software package SPSS 23.0. Based on the data obtained from descriptive analysis, we have formed determinants that are defined as survey segments. Therefore, several variables are aggregated into one determinant that is the carrier of all information related to the responses of each survey segment, using the arithmetic mean derived from the data on the same scale of measurement. In this way, we have obtained new statistical descriptive parameters that explain the form, distribution and heterogeneity/homogeneity of the data. This is a quantitative continuous random variable – the determinant; thereafter, it is verified if it belongs to the normal distribution of the random variable. For this verification, it was used the universal Kolmogorov-Smirnov statistical test.

After the application of the mentioned test, it was found that the new random variable – determinant does not fulfill the regularity of the random variable distribution, so it was necessary to apply one of the basic transformation methods, so-called “degree” transformation, after which it was repeated entire analytics and exploration for the so-called transformed random variable – determinant.

High heterogeneity has been eliminated by data transformation, so the determinant has the form of the so-called Gaussian bells, as it can be seen from the following tables and charts.

Table 1. Descriptive statistics of the determinants related to solving general problems of Stara Planina Mountain

Descriptive statistics		Statistics	Post-transformation statistics	
Solving general problems	Arithmetic mean	3.7827	14.8675	
	95% average trust interval	Low	3.6977	14.2773
		High	3.8678	15.4578
	Average mean	3.9200	15.3664	
	Variations	0.560	26,988	
	Standard deviation	0.74864	5.19501	
	Minimum	1.37	1.88	
	Maximum	4.90	24.01	
	Asymmetry	-0.933	-0.425	
Equalization	0.573	-0.486		

Source: Authors

Table 1 show that the average value of the determinant is 3.7827, the trust interval ranges from 3.6977 to 3.8678, with a standard deviation of less than 1, which also shows a moderate heterogeneity of the data. The average minimum value is 1.37 and the maximum is 4.90. The coefficient of asymmetry and flattening has been partly increased, as it can be seen on the chart of normal frequency distribution, Figure 1.

By the normality test (Table 2) it was verified the validity of the results values for solving the general problems of Stara Planina. Based on the obtained results shown in the table, it was found that the validity for parametric statistical tests has not been fulfilled. After that, it was done the degree transformation, as the first and the basic transformation,

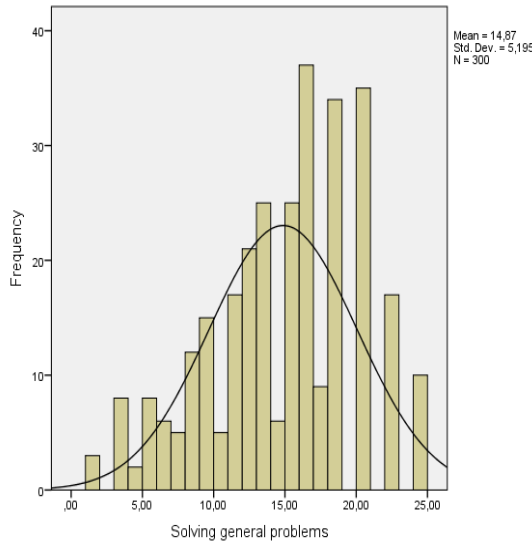
and in this way it was obtained a new determinant with an average value of 14.8675 with the trust interval from 14.2773 to 15.4578, and a standard deviation of 5.19501, where the values of the asymmetry and flattening were reduced, meaning that it fulfills the validity for parametric statistical tests. From the charts in Figure 1 it can be seen that the obtained results are arranged according to the Gaussian curve.

Table 2. Normality test for the result values – solving the general problems of Stara Planina Mountain

	Kolmogorov-Smirnov		
	Statistic	df	Sig.
Solving general problems	0.089	300	0.001
Solving general problems TR	0.068	300	0.060

Source: Authors

Figure 1. Normal distribution of frequencies for solving general problems of Stara Planina



Source: Authors

Table 3 shows that the average value of the determinant is 3.3356, the trust interval varies from 3.3356 to 3.4223, with a standard deviation of less than 1, which also shows a moderate heterogeneity of the data. The average minimum value is 1.46 and the maximum is 4.88. The asymmetry and flattening coefficient is partially increased, as it can be seen on the chart of the normal frequency distribution, Figure 2.

Table 3. Descriptive statistics of the determinants related to preventing ecological problems of Stara Planina Mountain

Descriptive statistics		Statistics	Post-transformation statistics	
Preventing ecological problems	Arithmetic mean	3.3356	11.7069	
	95% average trust interval	Low	3.3356	11.1386
		High	3.4223	12.2752
	Average mean	3.4000	11.5600	
	Variations	0.583	25.016	
	Standard deviation	0.76343	5.00162	
	Minimum	1.46	2.13	
	Maximum	4.88	23.81	
	Asymmetry	-0.234	0.218	
	Equalization	-0.637	-0.650	

Source: Authors

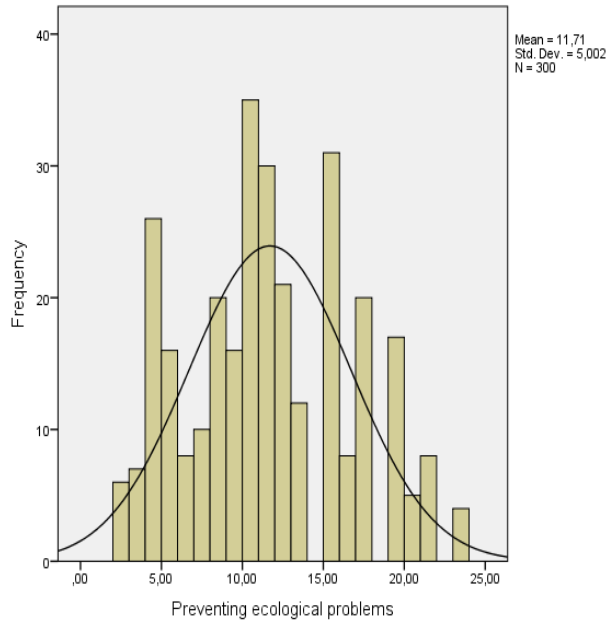
With the normality test (Table 4) it was verified the validity of the results obtained for the prevention of the ecological problems of Stara Planina. Based on the obtained results shown in the table it was concluded that the validity for parametric statistical tests has not been fulfilled. After that, it was made the degree transformation, as the first and the basic transformation. In this way it was obtained a new determinant with an average value of 11.7069 in the trust interval from 11.1386 to 12.2752, with a standard deviation of 5.00162, where the values of the flattening asymmetry were reduced. It shows the fulfillment of the validity for parametric statistical tests and from the charts in Figure 2 it can be seen that the obtained results are arranged according to the Gaussian curve.

Table 4. Normality test for results values – preventing the ecological problems of Stara Planina Mountain

	Kolmogorov-Smirnov ^a		
	Statistic	df	Sig.
Preventing ecological problems	0.086	300	0.002
Preventing ecological problems TR	0.066	300	0.062

Source: Authors

Figure 2. Normal distribution of frequencies – preventing ecological problem of Stara Planina



Source: Authors

Results

For real hypothesis testing there were made two new sets of determinants. Each of them is made of two determinants of similar characters. The problems of the Stara Planina Mountain, as the first set, were sorted into two, general and ecological problems. Consequently, both determinants were taken into account in order to detect which of them can solve the obstacles that prevent the rural tourism development on Stara Planina. The determinants related to the respondents' statements important for the improvement of rural tourism in the area of Stara Planina represent so-called determinants of solving general problems. The determinants related to the respondents' statements important for solving environmental problems in the area of Stara Planina represent so-called determinants of the environmental problems prevention.

Table 5. Descriptive parameters for dependent and explanatory determinant of the first set of determinants

Descriptive parameters	Average value	Standard deviation	Number
Improving rural tourism TR	15.1225	5.73778	300
Solving general problems TR	14.8675	5.19501	300
Preventing ecological problems TR	11.7069	5.00162	300

Source: Authors

Table 5 shows the average values of the first set of determinants after the degree transformation of the average initial scale used for the evaluation in the survey.

Table 6. Coefficients of the multiple correlations between first set of determinants that explain improvement of rural tourism

Simple linear correlation	Determinant coefficient	Fixed determinant coefficient	Standard deviation
0.36	0.129	0.123	5.37214

Source: Authors

Table 6 shows that the coefficient of free linear correlation as a relative measure is positive (0.36), suggesting a certain connection between the variables. The determination coefficient is 0.129, and the corrected determination coefficient is 0.123. The improvement of rural tourism of Stara Planina depends to a certain extent on solving the general problems, as well as on preventing the ecological ones, and in this case it is almost 13%. This is an important indicator, as it can be seen in the table below. The standard evaluation error for the tested variable is less than the sample error, which indicates the model's justification.

Table 7. Justification of the multiple regression analysis of the model via Anova test

Justification of the model	Square amount	df	Square average	F test	Deviation probability
Regression	1272.309	2	636.155	22.043	0.00
Residual	8571.388	297	28.860		
Total	9843.698	299			

Source: Authors

Table 7 shows that the multi-correlation coefficient is statistically significant, which means that the percentage of explained positive variation is 13% and correlates with the explanatory determinant, as confirmed by the statistical F test.

Table 8. Statistical parameters of the multiple regression model of the first set of determinants

Statistical model parameters	Non-standard coefficients		Standard coefficients	t	Probability of error	Mutual collinearity	
	B	Std. error	Beta			Tolerance	VIF
Constant	8.553	1.037		8.248	0.000		
Solving general problems	0.284	0.064	0.258	4.432	0.000	0.868	1.152
Preventing ecological problems	0.200	0.067	0.174	3.000	0.003	0.868	1.152

Source: Authors

Table 8 shows that the partial coefficients of the multiple regression of the segment of dependent determinants and the inclination of the explanatory determinant are statistically significant, as it can be seen from the t test statistics, because they are greater than the table values with a probability of error of less than 0.05. Based on standardized Beta coefficients, it can be concluded that solving general problems has a higher priority than preventing environmental problems, as indicated by a higher Beta coefficient.

Conclusions

The protection of the environment on Stara Planina Mountain is a serious problem, because a large number of visitors are not willing to protect the natural environment. According to the conducted research, the biggest ecological problem at the destination of Stara Planina is communal waste, as well as the wastewater. According to this survey, responsibility for these problems lies with the municipality and environmental polluters. Therefore, it is necessary to take appropriate environmental protection measures in this area, which represents the most important segment of tourism business. Environmental protection affects the quality of life, with a tendency to be more significant in the future.

The development of rural tourism on Stara Planina significantly depends on the solutions of general problems, the most prominent of which is the unemployment of the local population. Also, the development of tourism depends on the prevention of the environmental problems of Stara Planina, among which the problem of waste water and communal waste are the most serious. Based on the statistical tests, it can be concluded that solving general problems has a higher priority compared to the prevention of environmental problems, as indicated by the statistical parameters of the multiple regression model of the first set of determinants.

Based on the results obtained in this research, the hypothesis that initiated this research has been proven, which also means that the improvement of rural tourism on Stara Planina depends on solving general and preventing environmental problems.

Conflict of interests

The authors declare no conflict of interest.

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PERSONAL SUBJECTIVITY IMPACT REDUCTION IN CHOICE OF SOUR CHERRY VARIETIES FOR ORCHARD ESTABLISHMENT USING FUZZY SYSTEM

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ABSTRACT

This paper analyzes the problem of multi-criteria decision-making methods (MCDM) when selecting the optimal type of sour cherry for planting. Choice of varieties in agriculture is a very complex problem and is usually characterized by the interaction of a large number of factors, including often limited resources and uncertain information (price, time). In this context, mathematical models can represent valuable support for farmers when deciding on the choice of crops and plants for planting. An integrated MCDM method is presented, along with expert knowledge and Fuzzy Interference System (FIS) for sour cherry varieties choosing. The proposed approach assists decision makers in complex calculations and diminishes the impact of personal subjectivity and perception in order to define the overall evaluation. Data is incorporated in proposed fuzzy system and validated by a numerical example.

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Introduction

The global market value, production and harvested area of sour cherries have rapidly increased over the last 15 years and continue to grow, signifying their growing importance in the food and horticultural industries (FaoStat, 2015). Serbia was on seventh place in world production, with an average production of 98271 metric tons (FaoStat, 2013). Commercial sour cherry production is very important for Serbia, because most of the fruits are exported (or as frozen, either as canned or as fruit concentrates). Agricultural planning and varieties choice can nowadays be considered as MCDM problems. Quantity is not the only problem in sour cherry production. Quality should also be

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preserved through pre and postharvest treatments. The parameters for assessing the quality of saplings are variable and depend on specific purposes (South et al., 1989). There are many criteria by which a choice of sour cherry varieties for planting can be made, such as: appearance, yield, price, firmness and crispness, resistance to weather conditions, resistance to disease, harvesting resistance and transport, etc.

Selection problem is a multi-objective problem in which different criteria should be taken into consideration. It is essential to compare cherries according to the criteria that contribute to the achievement of the objectives of the agricultural enterprise. Various mathematical techniques have been used by the researchers for this problem. The decision maker needs to deal with both qualitative and quantitative factors.

The classical MCDM methods cannot effectively address decision problems incorporating imprecise and linguistic information. Soft computing techniques are group of unique methodologies, often complement to each other, and provide flexible information processing capabilities in solving real-life problems. One such technique is the fuzzy approach which can be used to solve very complex real-world decision-making problems such as a crop and plant choosing.

In this paper, an integrated MCDM method along with expert knowledge and FIS for sour cherry choice is presented. Evaluation of the criteria is done by using fuzzy logic and Fuzzy Inference System (FIS). Approximate reasoning algorithm modeling the human experts reasoning process much more realistically than the conventional expert systems. Proposed approach relieves decision makers from the complex calculations and reduces the impact of personal subjectivity.

Literature review

Agricultural planning and choice problems were formulated as multi-objective models (Mainuddin et al., 1997; Sarker, Quaddus, 2002; Joubert et al., 2007). Optimization techniques are widely used in complex practical problem solving in many areas. Although optimization problems in agricultural systems such as crop and plant choice (Detlefsen, Jensen, 2004) do exist, such as country-wide crop planning (Sarker et al., 1997), irrigation planning (Raju, Kumar, 1999), vegetable production (Francisco, Ali, 2006), etc. More optimization problems dealing with management of agricultural resources can be found in paper by Weintraub and Romero, 2006.

Two different mathematical formulations for the analyzed crop choice problem are provided by Filippi, et al., 2017. The first one represents a natural integer programming formulation looking for the crop-mix that maximizes the farmer's expected profit measured as the difference between revenues obtained by selling the harvested products and the production costs. The second model uses the maximization of the Conditional Value-at-Risk (CVaR) as objective function and looks for the crop-mix that allows to maximize the average expected profit under a predefined quintile of worst realizations.

AHP method takes a significant place during the selection of MCDM techniques. A research conducted by Milovanović, Stojanović, 2016, represents a choice of cherry varieties for planting by the application of the AHP methodology. Critics of the AHP method indicate that significance of elements presents only some sort of arithmetic accuracy that does not reflect real or objective evaluation. AHP does not take into account the uncertainty associated with perceptions of a decision-makers (Gajovic et al., 2017).

During the planning, due to ambiguous or uncertain information caused by the vagueness of decision makers' subjective preference or the uncertainty of objective information, soft computing techniques are gaining an increasing importance in real-life problem solving.

Zenga et al., proposed the fuzzy multi-objective linear programming (FMOLP) model for crop planning with triangular fuzzy numbers and transformed the FMOLP model and its corresponding fuzzy goal programming (FGP) problem to crisp ones which can be solved by the conventional programming methods.

Adeyemo and Otieno present four strategies of a novel evolutionary algorithm, multi-objective differential evolution algorithm (MDEA). The four strategies, namely, MDEA1, MDEA2, MDEA3 and MDEA4 are adapted to solve the multi-objective crop planning model with multiple constraints.

Determining the Criteria

Sour cherry (*Prunus cerasus L.*) is one of the most tolerant to biotic and abiotic stresses (Lezzoni et al., 1990). Those characteristics make sour cherry more adaptable to a wide range of continental climatic conditions. It is a profitable fruit and widely used in industry. Sour cherries are consumed dried, frozen or as juice (concentrates).

In addition to having nutritional properties, it has been proven to be extremely useful fruit since it contains and has antioxidant and antiinflammatory properties. Due to this fact, sour cherry can be considered "functional food". The distinctive purplish-red colour of sour cherry juice is due to its anthocyanin content. Sour cherries have a high level of vitamin A (20% of the recommended daily intake in 100g) and vitamin C (22% of the recommended daily intake in 100g). It belongs to the group of high quality delicacy fruit. Great interest in this fruit, both scientific and other public, has been caused by the fact that sour cherries contain a significant level of anthocyanin (Wang et al., 1997). Anthocyanin from sour cherries have been shown to possess strong antioxidant and anti-inflammatory activity and inhibit the growth of human colon cancer cells.

Beside yield and sapling cost, experts also take many other criteria into consideration when choosing varieties of sour cherries for planting. Each market has its own preferences and opinions on what constitutes a high quality sour cherry.

In the literature, the authors point out many flower and fruit traits that are important for choosing in sour cherry breeding. They emphasize bloom date, ripening date, fruit dimension and weight, pit weight, fruit soluble solids concentration, fruit color, flesh

color, stem length and thickness. Also, resistance to diseases and season of maturity are important criteria. Yield per tree, easy separation of seed from fruit flesh, fitness to the mechanical harvest are also significant criteria in sour cherry cultivars.

In the case of sour cherries intended for table consumption, it is desirable that the fruit size is large (6-8 g). In processing varieties it is important to have good quality of meat, which is reflected in high content of dry matter, consistent sugar and acid ratio and high content of anthocyanin (in varieties with colored juice). Also, the variety of sour cherry should have a relatively small pit, whose participation in the weight of the fruits is less (it is desirable to be below 7%) and that the skin is more easily separated from the meat.

Skin colour (Serrano et al., 2005), total soluble solid and acidity ratio are the main quality parameters of sour cherries and both determine consumer acceptance (Crisosto et al., 2003). Sour cherries deteriorate rapidly as consequence of weight loss, color changes, softening, surface pitting and loss of acidity (Bernalte et al., 2003).

Firmness is considered extremely important by industry. Fruit firmness and crispness are often associated with freshness in fruit (Fillion, Kilcast, 2002). Further studies about firmness and crispness have been conducted and discussed (Harker et al., 2002; Evans et al., 2010). The aroma of sour cherries has been studied by Poll and Lewis, Schmid and Grosch.

Extension of the season of cherry harvest, as one of the goals of breeding, is significantly less due to the longer supply of fresh fruits on the market, and to a greater extent due to more efficient use of labor and mechanization for the performance of harvesting and processing. Sour cherry harvest is done whether by hand or mechanical harvesters. The cost of harvesting by hand amounts up to 55% of all production costs in sour cherry (Brzozowski, 2005). In order for the sour cherries to be suitable for mechanized harvesting, they need to possess the following characteristics: upright growth of the branches, uniform maturation of the fruit, easy separation of the fruit from the stem, absence of leakage of juice in the separation of the fruit from the stem and good transportability of the fruits (Mišić, 1989). The major loss in quality after harvest includes moisture loss, softening, decay etc., so combination of good handling practice and applications of appropriate postharvest technology.

One of the criteria for choosing varieties of cherries for planting is the resistance to disease. The most important cherry pathogen is *Blumeriella jaapii* fungus, which causes leafiness. Experts are permanently working to isolate clones of cherries, with later ripening and increased resistance to some diseases.

Based on the best knowledge of experts, the criteria for the choice of sour cherries in this paper are: the price of saplings, the fruit dimension, the resistance of fruit to picking and transport, the yield of a particular variety and the resistance to disease. For this purpose, the experts are considering three types of cherries that are suitable for the processing and production: sour cherry Oblacinska, Sumadinka and sour cherry Meteor. The selection of these specific criteria is for illustrative purposes of the proposed model and depends on the preferences and needs of the concrete decision-maker (company).

Fuzzy system

In this paper authors use a modified fuzzy system based on the application of fuzzy logic and approximate reasoning algorithms as introduced by (Gajovic et al., 2017). Input variables are determined by the expert (the price of sapling - C1, the fruit dimension - C2, the resistance of fruit to picking and transport - C3, the yield of a particular variety- C4 and the resistance to disease-C5). Each element may be low, good, or high. The output value of the fuzzy system is the evaluation of each criteria of recommended varieties of sour cherry, which can be very low, low, good, high, or very high.

The theory of approximate reasoning is a framework for computational modeling of human reasoning. This process mimics the human expert's reasoning process much more realistically than the conventional expert systems (Nafarieh, Keller, 1991). Methodology using fuzzy sets for the representation of human concepts and words, via the idea of linguistic variables. The primitive elements of an AR are a collection of variables, C_j for $j = 1, \dots, n$, and they are the objects of interest in the current context. It is information about the value of these variables, together with the relationships between the values of these variables that constitute the knowledge base. Associated with each variable C_j is a set X_j , which represents its domain and which indicates the allowable values for the variable.

The term rule, which is the most commonly used type of knowledge representation, can be defined as an IF-THEN structure that relates given information or facts in the IF part to some action in the THEN part. The IF part, called the antecedent (premise or condition) and the THEN part called consequent (conclusion or action). Rules can represent relations, recommendations, directives, strategies and heuristics.

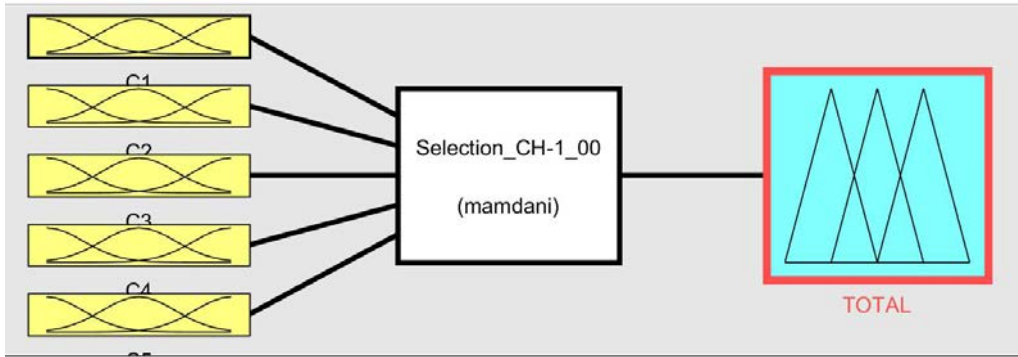
IF antecedent1 and antecedent2 and ... THEN consequent1.

Fuzzy logic allows both the antecedent and consequent to be fuzzy propositions. These fuzzy propositions comprise statements involving linguistic variables, which will have shades of meaning or varying degrees of truth. An antecedent of any rule may be a simple clause or may be a combination of number of clauses connected via the fuzzy logical operators AND, OR, NOT AND and NOT OR.

The results of the model

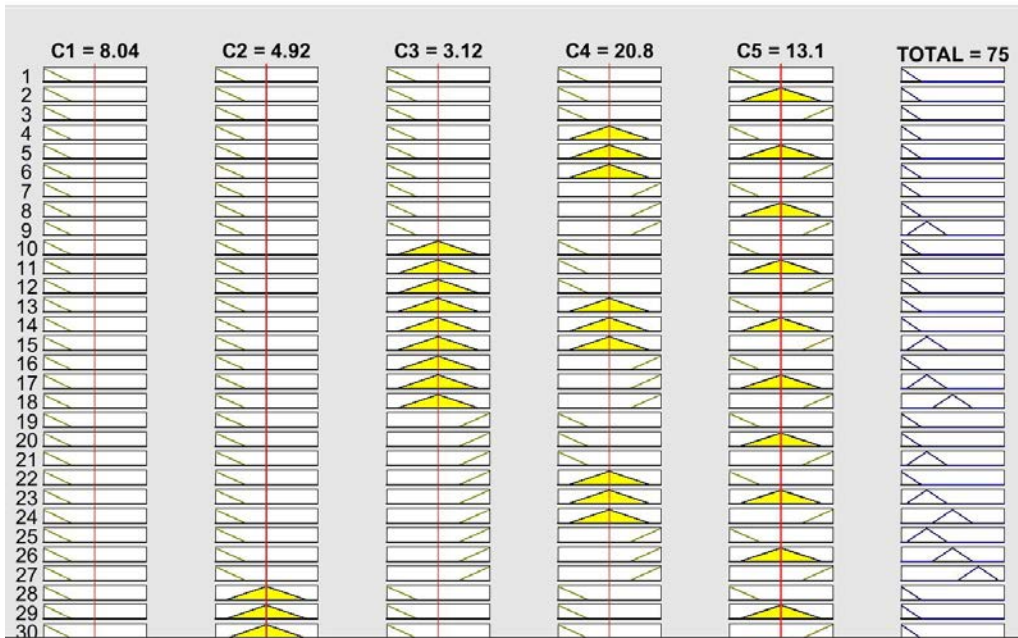
For the purpose of this work and model testing, we used data set provided by (Milovanović, Stojanović, 2016). The authors presented expert assessments of sour cherry varieties choice in the company 'Džervin', which will be used in our fuzzy system. Figure 1 shows the FIS chart with 5 input functions of each criterion that have the same shape. Input variables are the price of sapling (C1), the fruit dimension (C2), the resistance of fruit to picking and transport (C3), the yield of a particular variety (C4) and the resistance to disease (C5).

Figure 1. Fuzzy Inference System



We built 243 rules and applied Mamdani inference technique (Figure 2). During the defuzzification process, we used centroid method.

Figure 2. Fuzzy rules



The output of the system is the total evaluation of given criteria, which can be very low, low, good, high or very high. The problem is solved using Matlab - Fuzzy logic designer. Simulation process is done with 1000 random values. Results of the system are shown in Table 1.

Table 1. System output

Variable	Price of sapling-C1	Dimension -C2	Resistance (picking, transport)-C3	Yield - C4	Resistance to disease-C5
AHP	16,08	9,85	6,23	41,65	26,19
Weighted simulation values	16,85	9,79	6,25	41,12	25,99

The highest impact on the total evaluation of sour cherry choice has yield with 41.12% and resistance to disease of approximately 25.99%. The sapling price for the observed company has an impact of 16.85%. Fruit dimension and resistance to picking and transport have less impact on the total evaluation for the selected sour cherry variety (9.85% and 6.23% respectively). In this way, all varieties of sour cherries can be evaluated in a very fast manner, in particular according to the given criteria, by partial analysis of various elements which affects the overall evaluation. This leads to a reduction of inadequate estimations in decision-making in the evaluation process. The proposed approach also allows direct implementation of expert knowledge in the fuzzy system, which frees users from complex calculations, but also reduces the possibility of error.

Conclusion

Fuzzy logic and its techniques are a valuable tool in real-life problem modeling. Expert evaluations are often subjective, under the influence of many criteria and sub-criteria, which may be related and interact between themselves. Integrated MCDM method along with expert knowledge and Fuzzy Inference System for sour cherry varieties choice is proposed. Based on the best knowledge of experts, the criteria for the choice of varieties of sour cherries in this paper are: the price of saplings, the fruit dimension and weight, the resistance of fruit to picking and transport, the yield of a particular variety and the resistance to disease. The obtained results indicate that the yield of sour cherries is the most important criterion in deciding on the choice of variety, followed by the resistance to disease.

Taking into account the variability, or uncertainty of the problem considered, the weight factors of the elements can easily be corrected in the fuzzy system. In this way, the model enables efficient implementation of newly-acquired information. Moreover, the fuzzy model provides a more precise numerical evaluation of the observed parameters.

Conflict of interests

The authors declare no conflict of interest.

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USING SINGLE VALUED NEUTROSOPHIC SET TO SELECT TOURISM DEVELOPMENT STRATEGIES IN EASTERN SERBIA

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ABSTRACT

Natural beauties of Eastern Serbia combined with the culture, traditions, food specialties and music, can become a recognizable tourism brand, which could improve the image of this part of Serbia, and that is the reason why Eastern Serbia has been recently discovering its potential for tourism development. The aim of this paper is to analyze the current and potential elements for tourism development of Eastern Serbia's products. Based on the relevant literature and factual situation on the field, the goal is to rank strategies for tourism development on the territory of Eastern Serbia in order to enable better positioning of tourism in Eastern Serbia on the Serbian tourist map. In order to rank tourism development strategies we have used neutrosophic sets. The justification and usability of the proposed approach for the selection of tourism development strategy is demonstrated in the implemented numerical example.

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Introduction

Modern tourism in the world, but also in our country, is manifested as a very significant spatial phenomenon. Tourism and geographic space with their attributes are inseparable concepts in the realization of tourism trends. Therefore, we have to consider the characteristics of certain areas in which tourism has developed and created well-known

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tourist destinations. The tourist destination consists of its attributes and the degree of their use, so depending on that, we can say whether it is a potential or already developed tourist destination.

The main resources of tourism development are natural resources, which we can consider a gift from nature, and which are used in the reproduction process of setting new useful values (Nikolić et al., 2013). Proper understanding of this process enables the dynamics of tourism development, as well as the identification of the main factors influencing changes in tourism development (Streimikiene and Bilan, 2015). The development and impact of tourism have significantly changed not only the original image of nature, but they also have formed new kinds of businesses. This means that for good economic and tourist valorization of space we need a good geographical basis, justified and applicative. Today, it is very important to create a strategy of a tourist destination and its appearance in the tourism market, while the correct strategy of performance is possible to choose only after considering the internal and external factors in the environment.

The territory of Eastern Serbia has natural and anthropogenic tourist potentials. The most important natural conditions and resources for the development of tourism are: relief, climate, water resources, flora and fauna properties, as well as other specificities of the natural environment. It has been proven that rich natural resources can provide a good comparative advantage in the tourism market; however, this necessarily requires investment in marketing strategy (Riznić et al., 2011). In this area there are also numerous nature reserves, monasteries, archaeological sites and, generally speaking, there is very important anthropogenic and natural heritage, important for both, this area and for the whole state. For the analysis of natural conditions that influence the development of tourism in the area of Eastern Serbia, we have used only those natural elements that can be placed relatively quickly in the tourist offer, although this area is extremely attractive for the development of various tourism forms and products (Cvijanović, 2014).

Architecture in urban and rural areas is very characteristic, and numerous rural ambient units are true representatives of the rural lifestyle of people in this area. Multiethnicity, represented by a wide spectrum of different content related to the customs and the life of locals in rural areas, is a chance that should be insisted on in the cultural offer of this area. A great cultural value also lies in the products of old crafts and handicrafts that are excellent representatives of the rich cultural heritage. The natural beauties of Djerdap, mountain Stara Planina, mountains Homoljske planine and many other attractive destinations, combined with culture, tradition, gastronomic specialties and music of Eastern Serbia, can become a recognizable tourist brand, which will significantly contribute to the income and improve the image of this region and the Republic of Serbia.

Strategies of tourist destinations positioning

The development of tourism and the increased participation of tourists in this kind of activities on the global level also enlarged the number of tourist destinations, which created a high level of competition in the world market. Tourist destinations have to

create promotional activities and a special image for the selected market. It all makes necessary to carefully consider the approach for the tourist destination positioning. The rising trend of tourist demand for new challenges imposes the need for better positioning of existing destinations and/or creating new ones in order to achieve better economic profit. The space, which initially met the basic needs for rest and recreation, today must possess exceptional specifics in order to be interesting among diverse tourist demand. A specific position on the tourist map of the region can be taken by choosing the appropriate strategies, as well as the positioning instruments. Positioning also represents the development of the image of tourist destinations that are in direct contradiction with the competition.

The positioning of tourism products has the influence on the awareness of potential consumers (service users) in order to develop a positive image of a specific product (tourist destination), where potential consumers become loyal consumers (service users). Positioning is a way of communicating a destination to consumers with the desire to influence their decision making process related to travels. This is a complex process that requires careful analysis of all attributes of the destination and characteristics of the target market (Štetić, 2003). This influence is seen as a cause-effect relation between destination and consumer, and the ultimate outcome is the consumers' (tourists') choice of the right destination. Therefore, the choice of a positioning strategy that would create a positive image and the desire of tourists to stay at that particular destination is a basic precondition for the proper performing strategy on a particular market. For successful positioning, it is necessary to understand consumer behavior (service user). When managing the tourist destination, the most important is to achieve the right balance between stakeholders, while the local community has the most important role – the community will feel most of the effects of tourism development (Galanta et al., 2016; Jawabreh, 2014).

Strategic changes of tourism in Serbia, according to the market changes and the strategic goals of the development of tourist destinations, require the identification of priority types of tourism (Čerović and Petović, 2006). Compared to the world's tourist trends, Serbia is a relatively new destination that seeks to take a favorable place in the tourism market through the development strategy.

Prospects for the development of tourism market based on natural and social resources

In Eastern Serbia there are great opportunities for tourism development. Eastern Serbia has real resources, which the Republic of Serbia has to recognize and put into function of its long-term tourism development. A large number of natural resources, as well as anthropogenic resources, are very important for this region. In addition, this area implies a dose of mysticism, mystery, special philosophy and beliefs that interpret life; in this part of Serbia reality and legends exist together.

As promising forms of tourism, but unfortunately not fully developed and exploited in Eastern Serbia, we can distinguish the following:

- **Rural tourism** – This area provides a wide range of different possibilities, whether it's tourism that would rely on tourists' staying in village farms or other kind of tourism related to rural areas. Bearing in mind the tendencies in the tourism market to move beyond the concept of mass tourism, interest in rural tourism has recently been growing. Serbia has so far failed to develop rural tourism more extensively (Maksimović et al., 2016b). Thanks to the natural, ecological and ambient characteristics, different rural areas are very interesting and promising for the development of rural tourism. Adequately built holiday homes in a preserved natural environment, characterized by peace and quiet, are real "oases" for people from highly urbanized, industrial centers. The main characteristic of modern tourism is the incorporation of an efficient ecological component into the overall tourism product and its promotion, treating it as a very important element for achieving a competitive position in attracting new tourist users (Urošević et al., 2015).
- **Ecotourism** – Ecotourism is a new model of tourism related to developing awareness of the correlation between tourism and environment. Today, the importance of ecotourism is growing, not only as a sector with great potential for economic development - especially in poorly developed areas – but also as a powerful tool for conserving the natural environment, if it is properly planned, developed and managed. Ecotourism is also a reliable tool for improving the local economy, especially in underdeveloped areas, such as the area of Eastern Serbia. The conducted studies (Arsić et al., 2017) show that for the sustainability of ecotourism of the National Park "Djerdap" the most important is the industry that could contribute even more to the sustainability and its further development.
- **Hunting tourism** – It would primarily involve organized structure for hunting tourism, and then appropriate investments that would bring real effects. Certain investments outside the territory of the National Park "Djerdap" are also needed in order to build hunting grounds with adequate infrastructure that would help developing this type of tourism.
- **Fishing tourism** – The entire area around the Danube River Basin provides excellent conditions for the development of fishing tourism. In that sense, it would be necessary to make certain investments in places where the fish would be fed ("feeding sites"), spawn and caught.
- **Food tourism** – It would be based on the rich cuisine tradition of Eastern Serbia and organically produced food, which represent an important part of the demand on the tourist market. Numerous gastronomic specialties typical for this area provide ideal opportunities for the development of this type of tourism.

- **Photo safari** – The area of the National Park “Djerdap” provides ideal conditions for this type of tourism, which is nowadays very popular in the Western European countries, as well as in the USA and Japan.
- **Bike tourism** – It represents the development of the adequate cycling trails and the infrastructure that would keep cyclist on the journey through this area. We have to emphasize that there is a significant demand from Western Europe for the routes in this part of the Balkans.
- **Excursions** – They would include visits to archaeological sites: Lepenski vir, Golubački grad, remains of Trajan’s bridge, Djerdap hydroelectric power plant and Felix Romuliana archaeological site.
- **Events** - A large number of events that take place in the cities in this area can attract, and they are already attracting, a large number of tourists. Zaječar is widely known for the musical rock manifestation “Gitarijada”, which has been organized for half a century. There are also “Days of Zoran Radmilović”, “Days of Mokranjac”, “Days of Hajduk Veljko”, Balkan festival of traditional culture of Vlachs, as well as many other events that take place in this region of Serbia.
- **Manifestation tourism** – It is based on agro-food products. Some of the events that take place in Eastern Serbia provide a good basis for building the image of this region as a tourist destination. In that sense, it is necessary to insist on a certain number of native products, originated from these parts. Mainly, we have to insist on organically produced agricultural products.
- **Mining tourism** - Abandoned mining sites have been raising interest as tourist destinations since more attention has been paid to the development of mining tourism today, which is an important component for the development of not only tourism, but also for the integral and sustainable development of the whole region. Revitalization and transformation of old mines into cultural and tourist centers, ecologically healthy environment or industrial and cultural heritage that tourists would like to visit and to stay in is important for both, the development of tourist destinations and the development of local communities. On the slopes of Stara Planina Mountain, east of the settlement Kalna, in the beech forest zone, there is the mine field “Janja”. In the last century, in the late fifties, there was an active exploitation of uranium in three mines: “Mezdreja”, “Gabrovnica” and “Srneći Do”, which ceased to operate in 1966. This mining site has its own peculiarities; however, these mining objects are deteriorating, even though they can be transformed into ethno or ecological centers, ecologically healthy environments that European tourists would be delighted to visit and stay in, while the other part can be organized as an industrial cultural heritage, and these cultural and historical goods should be placed under the protection of the state (Maksimović et al., 2016a). It is worth mentioning the new tourist destination, the pioneer of the mining tourism, the copper mine in Bor, where has been built

a large reception area with capacity of up to 60 people on the 11th cave horizon, where tourists can descend to a depth of 700 meters, take photos and talk to the miners. The mine also includes a viewpoint on the oldest surface mine deep about 500 meters (Maksimović et al., 2016c).

In the following years, it is primarily necessary to create the image of East Serbia as a tourist destination. This is an assumption based on which we could carry out the positioning of areas in potential markets, which would draw the attention of potential segments of consumers. The creation of the image should be carried out alongside with the image of whole Serbia; unfortunately, Serbia is not currently present in the international tourist market in an adequate way. The reasons for this lie in:

- Political situation in the area of Western Balkans in the last twenty years.
- Insufficient investments in tourism as an economic activity.
- Lack of the adequate strategy for the tourism development etc.

Spiking in long terms, it is necessary to focus on the surrounding countries, mainly on Romania and Bulgaria. We should achieve an adequate level of cross-border cooperation with them, considering common resources (the area of the National Park “Djerdap” belongs to the Republic of Serbia, but also to the Republic of Romania with its peripheral parts and resource bases, as well as Stara Planina Mountain, which extends mostly on the territory of Bulgaria).

Selection of tourism development strategy in Eastern Serbia

For the development of tourism in Eastern Serbia there have been suggested four strategies:

- Strategy A_1 – Aggressive marketing, propaganda and market appearance of tourism.
- Strategy A_2 – Creation of the necessary infrastructure that will help the development of tourism.
- Strategy A_3 – Preserving local culinary tradition and the development of indigenous species in organic farming and cattle breeding.
- Strategy A_4 – Development of human resources in the field of tourism.

On the basis on the relevant literature and the factual situation on the field, we will carry out the ranking of the mentioned strategies in order to select the best among them. The goal is to establish better position of tourism of this region on the tourist map of Serbia.

Strategy A_1 – Aggressive marketing, propaganda and market appearance of Eastern Serbia tourism. This strategy aims to establish an efficient marketing system in order to break the destination into target markets and market niches, to constantly identify sources of new competitive advantages and to monitor the capacity of loyalty, i.e. recommendations for visiting the destination. The latest definition of marketing in tourism has become even more complex and complemented by the demand for a new concept of sustainable development, which, in addition to its orientation towards society,

must be oriented towards nature and the environment. According to this, marketing must get a socially responsible development function, because it has to satisfy three basic tasks, i.e. three demands: to satisfy demand, to profit and to preserve nature. Marketing in tourism has two dimensions. The first dimension is based on market research, for the purpose of gathering information in order to meet market needs and to facilitate a harmonious development of the tourism market. The second dimension is that marketing should be humanized in order to understand the values and significance of many factors related to the natural environment (Vojnović *et al.*, 2012).

Tourist propaganda is one of the instruments of tourist policy aimed to achieve certain goals, which means that the actions of tourist propaganda must be preconceived. Tourist propaganda should be viewed integrally with other instruments of tourism, such as business policy, price policy, tourism development policy and the like (Unković and Zečević, 2009), but it can also be an incentive to the public and private sectors aimed at increasing the number of visitors and rational use of energy and other resources (Petrić and Mandić, 2014). For this strategy, it is important to build an appropriate image in consumers' mind, which should represent the destination attractive in both ways, natural and cultural. It is necessary to invest in the promotion of this region and the creation of the image of this tourist destination that would become recognizable on the tourist market.

Strategy A_2 - Creation of the necessary infrastructure that will help the development of tourism. An important factor that affects the successful selection of the strategy lies in the necessity to develop an infrastructure that would consist of accommodation, sports facilities, new access roads, educational camps as well as places for excursions and active entertainment (Nurić *et al.*, 2015). We cannot emphasize enough the significance of the road infrastructure development from the point of view of tourism development in the region. The quality of the transport and supply network must be at a satisfactory level in order to make an impact on the tourism development of a destination. The most significant impact on the extent of tourism business is hotel offer, accommodation and food facilities. Also, the development of a certain number of holiday-resort sites for nature lovers and the improvement of the offer of facilities that provide food and beverage can greatly help the development of tourism in Eastern Serbia.

Strategy A_3 - Preserving local culinary tradition thorough the development of indigenous species in organic farming and cattle breeding. What makes the area of Eastern Serbia truly recognizable is traditional cuisine. Local cuisine creates a unique feeling of hospitality and welcoming atmosphere. For livestock breeding development, e.g. on Stara Planina Mountain, we have adequate natural conditions, experience in livestock breeding gained through centuries, as well as the renown products from this area on the market. The ability to produce healthy food for the wider market in this ecologically clean environment is a comparative advantage, which prioritize the livestock breeding in this part of Serbia over other agricultural sectors. After obtaining the results of the pesticide impact on human health, organic production has been dispersed; it is an answer to all negative effects of the conventional production. Organic fruits, vegetables, meat, milk and other products have become highly demanded in the

market. Organic production includes indigenous species, whose existence is related to the area in which they were created; they are also well adapted to the natural conditions of the area where they are being produced. The importance of indigenous species in organic production is multiple. Apart from being very adaptable to the conditions, the cultivation of these plant and animal species preserves the natural biodiversity of the ecosystem in which they are found. Among the autochthonous products, the most characteristic are dairy products: cheese from Stara Planina (Pirot), butter, urda, sheep cheese, white cheese - slice, vurdá, sour milk. This region is famous for its dairy products and lamb production, as well as for mushrooms and fruit: apples, pears, blueberries, blackberries, which give opportunities for the development of culinary tourism.

Strategy A_4 - Development of human resources in the field of tourism in Eastern Serbia. The quality of tourist services depends to a large extent on the quality of performance, good will and education of human resources at all levels. This immediately encompasses the question: how is the importance of the human factor (as the carrier and executor of tourist activities in a certain area) being perceived? Tourism is a labor-intensive activity, which means that a lot of human potential is needed in order to carry out this economic activity. Modern technical aids mainly contribute to the acceleration of individual work processes, changing the technology of work, but, as a rule, have a smaller impact on the reduction of the number of employees, especially in the catering industry. Tourism is an economic activity that largely depends on the human factor, because in tourism, people interact with consumers/tourists (Cvijanović and Vukovic, 2012).

The Single Valued Neutrosophic Set

The neutrosophic set (NS) is proposed by Smarandache (1998) in order to cope with problems that are associated with inconsistent and undetermined information. Further, Smarandache (1998) and Wang *et al.* (2010) proposed the single valued neutrosophic set (SVNS) suitable for solving many real-world decision-making problems. Until now, NS has been applied in numerous cases for solving a wide range of problems such as: Sustainable market valuation of buildings by the single-valued neutrosophic MAMVA method (Zavadskas *et al.*, 2017), Garage location selection for residential house by WASPAS-SVNS method (Baušys and Juodagalvienė, 2017), restaurant selection (Stanujkic *et al.*, 2016) and so on.

Basic definitions and operations with the SVNS

Definition 1. Let X be the universe of discourse, with a generic element in X denoted by x . Then, the Neutrosophic Set (NS) A in X is as follows (Smarandache, 1999):

$$A = \{x < T_A(x) \ I_A(x) \ F_A(x) > | x \in X\}, \quad (1)$$

where $T_A(x)$, $I_A(x)$ and $F_A(x)$ are the truth-membership function, the indeterminacy-membership function and the falsity-membership function, respectively,

$$T_A, I_A, F_A : X \rightarrow]^{-}0, 1^{+}[\text{ and } ^{-}0 \leq T_A(x) + I_A(x) + U_A(x) \leq 3^{+}$$

Definition 2. Let X be the universe of discourse. The Single Valued Neutrosophic Set (SVNS) A over X is an object having the form (Smarandache, 1998; Wang *et al.*, 2010):

$$A = \{x < T_A(x) \ I_A(x) \ F_A(x) > | x \in X\}, \tag{2}$$

where $T_A(x)$, $I_A(x)$ and $F_A(x)$ are the truth-membership function, the intermediacy-membership function and the falsity-membership function, respectively, $T_A, I_A, F_A : X \rightarrow [0,1]$ and $0 \leq T_A(x) + I_A(x) + U_A(x) \leq 3$.

Definition 3. For an SVNS A in X , the triple $< t_A, i_A, f_A >$ is called the single valued neutrosophic number (SVNN) Smarandache (1999).

Definition 4. SVNNs. Let $x_1 \approx < t_1, i_1, f_1 >$ and $x_2 \approx < t_2, i_2, f_2 >$ be two SVNNs and $\lambda > 0$; then, the basic operations are defined as follows:

$$x_1 + x_2 \approx < t_1 + t_2 - t_1 t_2, i_1 i_2, f_1 f_2 >. \tag{3}$$

$$x_1 \cdot x_2 \approx < t_1 t_2, i_1 + i_2 - i_1 i_2, f_1 + f_2 - f_1 f_2 >. \tag{4}$$

$$\lambda x_1 \approx < 1 - (1 - t_1)^\lambda, i_1^\lambda, f_1^\lambda >. \tag{5}$$

$$x_1^\lambda \approx < t_1^\lambda, i_1^\lambda, 1 - (1 - f_1)^\lambda >. \tag{6}$$

Definition 5. Let $x \approx < t_x, i_x, f_x >$ be a SVNN; then the cosine similarity measure $S_{(x)}$ between SVNN x and the ideal alternative (point) $<1,0,0>$ can be defined as follows (Şahin, 2014; Ye, 2014):

$$S_{(x)} = \frac{t}{\sqrt{t^2 + i^2 + f^2}} \tag{7}$$

Definition 6. Let $A_j \approx < t_j, i_j, f_j >$ be a collection of SVNSs and $W = (w_1, w_2, \dots, w_n)^T$ be an associated weighting vector. Then the Single Valued Neutrosophic Weighted Average (SVNWA) operator of A_j is as follows (Şahin, 2014):

$$\begin{aligned} SVNWA(A_1, A_2, \dots, A_n) &= \sum_{j=1}^n w_j A_j \\ &= \left(1 - \prod_{j=1}^n (1 - t_j)^{w_j}, \prod_{j=1}^n (i_j)^{w_j}, \prod_{j=1}^n (f_j)^{w_j} \right) \end{aligned} \tag{8}$$

where: w_j is the element j of the weighting vector, $w_j \in [0, 1]$ and $\sum_{j=1}^n w_j = 1$.

Numerical example

With the goal to briefly demonstrate the proposed approach and show the efficiency and usability of the SVNS, a numerical example will be conducted in this section. Suppose that a 3 decision makers should evaluate the four development strategies denoted as A_1 , A_2 and A_3 and A_4 discussed in previous section in relation to the five evaluation criteria with the same significance: C_1 – The implementation of the strategy feasibility; C_2 – The speed of implementation; C_3 - Compliance with the strategy of the development of tourism and local economic development; C_4 – An economic profit and C_5 – the satisfaction of service users.

At the beginning of the evaluation, decision makers evaluate alternatives. Ratings of the alternatives expressed in terms of the SVNS obtained on the basis of the three experts are given in Tables 1 to 3.

Table 1. The ratings obtained based on the first expert

	C_1	C_2	C_3	C_4	C_5
w_j	0.20	0.20	0.20	0.20	0.20
A_1	<0.7,0.2,0.2>	<0.6,0.3,0.2>	<0.59,0.15,0.4>	<0.7,0.05,0.35>	<0.7,0.05,0.3>
A_2	<0.8,0.1,0.2>	<0.65,0.15,0.3>	<0.5,0.4,0.3>	<0.55,0.05,0.4>	<0.6,0.15,0.25>
A_3	<0.65,0.1,0.3>	<0.75,0.2,0.3>	<0.55,0.3,0.4>	<0.4,0.4,0.3>	<0.45,0.3,0.35>
A_4	<0.6,0.25,0.35>	<0.65,0.05,0.35>	<0.8,0.2,0.1>	<0.9,0.15,0.05>	<0.7,0.55,0.15>

Source: Authors' calculations

Table 2. The ratings obtained based on the second expert

	C_1	C_2	C_3	C_4	C_5
w_j	0.20	0.20	0.20	0.20	0.20
A_1	<0.65,0.2,0.3>	<0.55,0.15,0.2>	<0.65,0.2,0.2>	<0.55,0.1,0.3>	<0.6,0.1,0.3>
A_2	<0.85,0.2,0.1>	<0.7,0.25,0.2>	<0.6,0.35,0.15>	<0.5,0.15,0.3>	<0.65,0.05,0.35>
A_3	<0.85,0.2,0.15>	<0.8,0.2,0.2>	<0.85,0.3,0.2>	<0.8,0.2,0.1>	<0.55,0.3,0.15>
A_4	<0.7,0.25,0.2>	<0.75,0.15,0.25>	<0.85,0.2,0.05>	<0.9,0.3,0.05>	<0.9,0.15,0.25>

Source: Authors' calculations

Table 3. The ratings obtained based on the third expert

	C_1	C_2	C_3	C_4	C_5
w_j	0.20	0.20	0.20	0.20	0.20
A_1	<0.6,0.2,0.35>	<0.7,0.15,0.2>	<0.6,0.2,0.2>	<0.65,0.15,0.25>	<0.4,0.3,0.35>
A_2	<0.75,0.25,0.2>	<0.75,0.2,0.25>	<0.65,0.3,0.3>	<0.55,0.2,0.3>	<0.65,0.15,0.35>
A_3	<0.7,0.15,0.2>	<0.65,0.15,0.25>	<0.55,0.4,0.35>	<0.65,0.2,0.15>	<0.65,0.2,0.15>
A_4	<0.85,0.2,0.15>	<0.7,0.15,0.15>	<0.7,0.2,0.25>	<0.75,0.2,0.25>	<0.9,0.15,0.3>

Source: Authors' calculations

The ranking orders obtained based on all the three experts are accounted for in Table 4.

Table 4. The ranking orders obtained from the three examinees

	E_1	E_2	E_3	E_1	E_2	E_3
	S_i	S_i	S_i	Rank	Rank	Rank
A1	0.910	0.900	0.880	2	4	4
A2	0.897	0.935	0.889	3	3	3
A3	0.821	0.942	0.910	4	2	2
A4	0.953	0.962	0.945	1	1	1

Source: Authors' calculations

According to Table 4, the most appropriate alternative based on the theory of dominance is the alternative denoted as A_4 .

The data in Table 4 indicate that the strategy designated as the A4 is best-ranked alternative. The strategy designated as A4 is based on the development of human resources in tourism.

In this paper we have proposed four strategies for the development of tourism in Eastern Serbia. The purpose of the strategy selection is to understand the key elements necessary for the development of tourism. The study shows four potential tourism development strategies and suggests an approach to select the best one in accordance with defined evaluation criteria. Based on the conducted research and analysis, the opinion of the expert in this field has led to the conclusion that the Strategy designated as A4 - human resources development in the tourism of eastern Serbia – is best ranked in terms of evaluation criteria.

In tourism, we can detect high level of personnel's interaction with consumers (tourists), therefore it is very important that people are well educated and trained in order to be able to provide the appropriate level of service quality (Urosevic, 2015; Cvijanovic and Vukovic, 2012). Tourism is one of the most important industries with rapid expansion and continuous growth, so it offers a large number of jobs (Thitthongkam and Walsh, 2010). In parallel with the development of tourism, there has been a development of professionals who linked their lives, work, economic and existential interests to tourism as a social and economic activity (Stefanović, 2009; Stefanović and Urošević, 2012). The personnel must be specially educated in order to establish direct contact with the guests and provide them with complete information (Vojnović *et al.*, 2012). Personnel in tourism must have a broad general culture and education. Tourist business in most cases takes place through direct and on-the-spot contact between the tourist service providers and consumers/tourists. Therefore, the character of the personnel working in tourism is quite specific. In fact, personnel is directed to act on the principles of economic efficiency, but at the same time they must interact with their guests/tourists as selfless hosts, full of understanding for their needs (Vojnović *et al.*, 2012). Apart from the traditional gastronomic skills, personnel in tourism are expected to be the creator of a new "healthy" diet. Tourists on vacation want direct contact with the gastronomy, so

the host is expected to explain expertly, in the tourists' language, the ingredients and the procedure of meal preparation, so that after returning to their country they can prepare it by themselves.

Considering the increasing digitalization in tourism capacities, tourism personnel must have a significantly higher level of IT literacy, because the users of tourist services are nowadays people with high IT skills.

Conclusion

In the following years, it is necessary to work primarily on the image of Eastern Serbia as a tourist destination. This is an assumption, based on which we could carry out the positioning of this area in potential markets, which would capture the attention of potential segments of tourist consumers. In this paper, we have suggested four strategies for the development of tourism, where, on the basis of the relevant literature and the facts obtained on the field we have ranked them. Based on the conducted research, the opinions of competent experts in this field and the application of neutrosophic sets, it has been concluded that Strategy A4, based on the development of human resources in tourism, is the one that would be useful for the development of tourism in Eastern Serbia, because in almost all segments there is a lack in quality and educated personnel. All participants in the image creation and tourist products in the area of Eastern Serbia should be working in an organized manner. Local communities should create a favorable business environment and basic conditions for the development of this activity. Educational and research institutions should produce adequate personnel and provide interest-based connection and marketing performance in the function of raising the competitiveness of tourism products in this beautiful area.

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TECHNICAL EFFICIENCY OF SERBIAN DAIRY PROCESSING INDUSTRY

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ABSTRACT

Serbian dairy processing sector is passing through significant structural changes in last couple decades. Concentration, vertical coordination and integration become a main characteristics. The main goal of the paper is to explore technical efficiency of 91 Serbian dairy processors in sample by non-parametric method Data envelopment analysis. Data were collected from financial reports of dairy companies in 2015. All dairy companies were divided in 4 groups: micro, small, middle and big. The empirical results indicate that 16.5% of companies were technically efficient. This study shows that efficient companies exist across all size groups, and while small companies suffer from input inefficiency and insufficient size of business, the bigger companies are over invested.

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Introduction

Among all dairy species, cow milk is the most important type in Serbia with 96% share in human diet, while goat and sheep milk has marginally shares. Average yearly consumption in Serbia in 2015 was 222 kg per capita, calculated in milk equivalents (ME). Under milk equivalent is implied amount of liquid milk used to produce dairy products. At same time in EU-28 average consumption was 306 kg ME/capita/year ranging from 178 kg ME/capita/year in Hungary to 638 kg ME/capita/year in Ireland (Hemme, 2016).

Milk production in Serbia is based mainly on family farms in two different production regions, lowland and highland. Small farms with up to 9 cows producing 2/3 of total milk in Serbia (Popovic, 2014). Raw milk market is one of significant challenges for processors. In couple recent decades big dairy companies, followed latterly by middle sized dairies invested significant effort to secure quantity and quality of row milk supply.

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Dairy industry in Serbia is consisted from 114 companies, ranged from micro to big. While dairy industry in the most of EU and other developed countries is dominantly or completely based on cooperatives, in Serbia they don't exist in dairy sector. Similar situation is in almost all other food sectors except several new generation cooperatives in fruit sector. Dairy processing industry in Serbia is characterized by several trends. Milk is by 2/3 processing in dairy plants while significant amount still used and processed on farms. Processing share of dairy companies during years increasing, on account of milk processed and used on farms. Number of dairy companies decreasing partially as result of concentration process, especially in case of big companies, like Imlek.

Several small and middle sized companies use strategies more oriented into vertical integrations. Some companies invested in downstream vertical integration trying to secure input supply sector and some quite successful companies invest in upstream vertical integration with goal to establish own retail network (Popovic, Panic, 2015). Small dairy shops help them to bypass highly concentrated retail companies and their market power. Usually established on frequent places, like green markets or frequent pedestrian areas, dairy shops shorten period from row milk payment to cash revenue from dairy products sold and increase profitability of dairy companies.

Dairy processing sector in Serbia lost market power a decade ago (Popovic, Radovanov, 2010). Under pressure from retailers and increased competition, processors had to focused more on technology and market efficiency.

Studies of efficiency of dairy processing industry are not numerous, while studies of dairy farms are well represented. In case of Serbia efficiency of dairy processing industry is not yet exploited, but efficiency of dairy farms was topic of several researches (Popovic, 2006, 2013). Some authors investigated productivity of dairy industry like Barać and Muminović (2013). Measuring the impact of capital investments on different quantitative and qualitative features of dairy processing companies in Slovenia, Croatia and Serbia stated that capital investments per employee significantly increase productivity measured by EBITDA and personnel costs.

Baran (2012) evaluated efficiency of the production scale of Polish milk processing companies in 1999–2010 using non-parametric methods. The non-parametric approach stemmed from linear programming Data Envelopment Analysis (DEA) method. The study involving a sample of 743 objects revealed increasing returns to scale observable in the Polish dairy sector. Author emphasizes that the gap between the Polish milk processing and leading European countries implies that there is a need for improved efficiency and international competitiveness.

Investigating technical efficiency among dairy cooperatives and investor owned firms in: Belgium, Netherland, Denmark, Germany and France during period 1995-2005 Soboh, Lansink and Dijk (2014) applied stochastic frontier analysis (SFA). Results for 360 cooperatives and 861 investor owned firms shows that dairy cooperatives were slightly less efficient. Both cooperatives and investor owned firms are characterised by decreasing return to scale.

Špička (2015) evaluated the technical efficiency improvement of the Czech, Polish and Slovak corporate milk processors in the period 2008 – 2013 to identify the possible source of low competitiveness of the Czech and Slovak milk processors towards Poland. The analysis was based on individual data of 130 milk processors. The sample covers medium-sized and large companies only. Deflated data on sales, material and energy costs, staff costs and depreciation were used as output and inputs for efficiency calculation. The DEA method was used for calculation of technical efficiency, Malmquist index estimated the efficiency change in time. Two-sample t-test and the analysis of variance enhanced by Sheffe's test verified the statistical hypotheses. The results proved that the Czech and Slovak milk processors had lower efficiency improvement than Polish companies. Investment activity did not significantly affect the efficiency improvement.

Silva, Arzubi and Berbel (2004) measured the Azores dairy farms technical efficiency by applying a non-parametric efficiency analysis to a panel data of 122 dairy farms from the Azores, Portugal for 1996. Azores islands belong to the Portuguese territory and the main economic activity is dairy farming. The analysis used DEA with constant and variable returns to scale models, with an input-oriented model approach. Two outputs (milk production and subsidies) and three inputs (agricultural area, number of dairy cows, variable and fixed cost) were considered relevant. The results suggested that the average technical efficiency was very low (66,4%) compared with published research data and only a few (7%) dairy farms were found to be efficient.

Hambusch, Kirner and Ortner (2006) used Data envelopment analysis (DEA) to measure efficiency scores of Austrian dairy farms and to examine the relationship between efficiency and farm size. Data envelopment analysis (DEA) was applied to a sample of 222 highly specialised dairy farms. The results showed an average technical efficiency of 79 % and a scale efficiency of 94 %. According to the results, they concluded that natural conditions and management practices had a stronger impact on technical efficiency than farm size. An analysis of returns to scale revealed that 18 % of the sample farms were operating at constant returns to scale, 9 % above and 73 % below efficient scale.

Candemir and Koyubenbe, (2006) measured the production efficiency of dairy farms in the province of Izmir, Turkey, based on cross section data of 2003 covering 80 farms chosen by the method of proportional sampling. They used two types of DEA model: model with constant returns to scale and model with variable returns to scale, using three outputs and seven inputs. Exploration showed that forty nine percent of the dairy farms appeared to be fully efficient according to the assumption of constant return to scale (CRS). The average efficiency indices obtained under CRS and variable return to scale (VRS) were 0.934 and 0.954, respectively. Mean scale efficiency, on the other hand, was 0.978. Out of the selected dairy farms 21.2% were observed to be efficient in measuring the efficiency of single output milk production. Average efficiency indices under CRS and VRS and scale efficiency index were measured to be 0.782, 0.832 and 0.938, respectively.

Kelly *et al.* (2012) in their study tried to determine the levels of technical efficiency on a sample of Irish dairy farms utilizing Data Envelopment Analysis (DEA) and to identify key management and production factors that differ between producers identified as efficient and inefficient. DEA was used to generate technical efficiency scores under assumptions of both constant returns to scale (CRS) and variable returns to scale (VRS). The average technical efficiency score was 0.785 under CRS and 0.833 under VRS. Key production characteristics of efficient and inefficient producers were compared using an analysis of variance. More technically efficient producers used less input per unit of output, had higher production per cow and per hectare and had a longer grazing season, a higher milk quality standard, were more likely to have participated in milk recording and had greater land quality compared to the inefficient producers.

Al-Sharafat (2013) estimated the level of technical efficiency (TE) of dairy producing farms in Jordan by applying the stochastic production frontier (SPF) methodology to a sample of 100 dairy farms. The results of this study indicated that technical efficiency of milk production by most of dairy farms in Jordan is low. The mean technical efficiency was estimated to be only 39.5% for the sampled dairy farms. The results showed that there was a substantial technical inefficiency on dairy farms in Jordan suggesting inefficient production. According to his opinion, farmer's level of education, farmer's farming experience, farmer's contact with an extension services and herd size are the main determinants associated with TE in the sampled dairy farms. He suggests that technical efficiency can be improved through provision of education, training and orientation of the farmers toward dairy farming practices.

Aldeseit (2013) evaluated the performance of sampled dairy farms using farm level technical and scale input oriented efficiencies. To achieved the objective of the study Data Envelopment Analysis (DEA) was used to analyze data collected from 120 dairy farms in Jordan. Scale efficiency scores were estimated using constant return to scale and variable return to scale DEA models. The results revealed that the sampled farms were not operating at an optimal size. On average, the scale efficiency estimated at approximately 0.66, indicating scale-inefficiency under both constant returns to scale and variable returns to scale. Author emphasized this inefficiency indicates that the sampled dairy producers were overusing inputs to produce their level of output. Also, increase scale of operation dairy farmers in Jordan should increase the overall degree of technical efficiency. He suggests that extension services can assist in identifying the best management practices on how to improve farms technical efficiency.

Vlontzos and Theodoridis (2013) in their work measured the efficiency and the productivity change of Greek dairy firms, using non parametric approaches. This assessment was achieved by the computation of the CRS and the VRS DEA models, the context dependent DEA approach and finally, the evolution of the Malmquist productivity index. These empirical analyses based on data from 29 Greek dairy firms. They concluded that the average efficiency score is 0.73 and 0.81 under the CRS and VRS DEA model suggests that there is space for improvement regarding the allocation of the available resources. Also, results of this empirical studies showed that there was

significant difference in efficiency scores between firms producing dairy products in the Greek and the main milk producers of the EU, such as Germany and France.

Since Farrell defined the economic efficiency as product of technical efficiency (TE) and the allocative efficiency (AE), empirical analysis of firm efficiency broaden in most areas of economy. Technical efficiency is principal element in economic profitability as it measures the ability of the firm to produce maximal output from a given set of inputs. This will be reflected in the average cost of operation and, hence, will directly affect the competitive position of the firm (Ben-Belhasenn, 2000). Allocative efficiency reflects the ability of the firm to use the inputs in optimal proportions, given their respective prices. The allocative efficiency is necessary if the firm maximizes its profits or minimizes its costs at a given level of production (Ouattara, 2012).

DEA method is most often applied to analysis data on a sample of firms. It is a data oriented, non-parametric, deterministic approach for evaluating the performance of a set of peer entities called Decision Making Units (DMUs) (Cooper et al., 2004). DMUs are usually defined as entities responsible for turning input(s) into output(s), such as firms and production units (Kumar, Gulati, 2008). Unlike other methods (e.g. traditional regression methods) DEA constructs a frontier by comparing the data of each DMU with data of benchmark DMUs that perform better. (Hambrusch et al., 2006).

Since, Farrell (1957) introduced a concept to measure relative efficiency, two types of DEA model with integrated linear programming were developed. First was developed by Charnes et al. (1978) with assumed constant returns to scale (CRS). Second DEA model with variable returns to scale (VRS) was developed by Banker et al. (1984). Taking in account that various factors influence that DMUs not operating on optimal scale VRS is usually considered as more appropriate assumption.

DEA method has been widely used in dairy farms efficiency studies (Fraser, Cordina, 1999; Barnes, 2006; Minh, Long, 2009; D'Haese et al., 2009). Fraser, Cordina (1999) emphasise a several reason for using DEA analysis to measure dairy farm efficiency. Firstly, it is proposed that DEA is a useful tool in helping to identify key areas of interest in relation to extension efforts. Secondly, the type of information generated by DEA is detailed in relation to input use and the optimal factor mix, the identification of efficient farms within a sample and which farms are of most importance when it comes to benchmarking. Thirdly, in the last couple of years there has been a large increase in available computer software with which to undertake DEA. This software is easy to use and the results that are generated are easy to understand.

Materials and methods

Exploring efficiency of Serbian dairy industry in this paper is based on 2015 production year. The sample included 91 from 114 dairies. Number of dairy processing companies in sample represent 80% of all dairies, but its share in total milk processing in Serbia in 2015 was 98%. In accordance with Law on accounting of the Republic of Serbia, 51 of them is classified as micro, 29 small 9 medium scale enterprises, and 2 of them classified

as big enterprises. Data are provided from financial statements (balance sheet and income statements) published by Serbian Business Registers Agency (SBRA). Majority of 23 dairies not included in research are from group of micro enterprises that don't have obligation to publish financial statements. Some dairies without material, labor and energy cost, were excluded from research sample. In some cases dairy plants are smaller business of some companies, like in case Sava Kovačević, and it was not possible to separate dairy business from financially dominant part of other businesses.

Dairy companies in Serbia use various strategies. From sample data it can be inferred that some companies earns more revenue from row milk trade than from its processing. From sample, 18 dairy companies mainly from micro and some from small group of size earns more than half revenue from row milk sale to others. Those dairies collected row milk from farmers distribute mostly to big and medium size dairy processors.

Technical efficiency of dairy companies in Serbia is estimated by DEA input oriented, multi stage model with variable returns to scale (VRC). Comparing to the model with Constant return scale (CRS) it is more adequate to assume VRC approach since imperfect competition, government regulations, constraints on finance etc., may cause a firm to be not operating on optimal scale (Coelli et al, 2005). Each company in sample is treated as decision making unit (DMU), although some authors prefer term "firm". Model assume data on N inputs and M outputs for each I DMU. For the I -th DMU these are represented by the column vectors x_i and q_i , respectively. The $N \times I$ input matrix and the $M \times I$ output matrix, Q , represent the data for all I DMU. For each DMU ratio of all outputs over all inputs could be obtained by $u'q_i/v'x_i$, where u is an $M \times 1$ vector of output weights and v is a $N \times 1$ vector of input weights. The optimal weights are obtained by solving mathematical programming problem:

$$\begin{aligned} & \max_{u,v} (u'q_i/v'x_i), \\ \text{st}^3 \quad & u'q_j/v'x_j \leq 1, \quad j=1,2,\dots,I, \\ & u, v \geq 0. \end{aligned}$$

Values for u and v , such that the efficiency measure for the i -th DMU is maximised, subject to the constraints that all efficiency measures must be less than, or equal to one. To avoid infinite number of solutions in the ratio formulation it is necessary to impose constraint $v'x_i = 1$, which provides:

$$\begin{aligned} & \max_{\mu,v} (\mu'q_i), \\ \text{st} \quad & v'x_j = 1, \\ & \mu'q_j/v'x_j \leq 1, \quad j=1,2,\dots,I, \\ & \mu, v \geq 0. \end{aligned}$$

3 "st" stands for Subject to

Change of notation from \mathbf{u} and \mathbf{v} to $\boldsymbol{\mu}$ and $\boldsymbol{\nu}$ is used to stress that this is a different linear programming problem. Using duality in linear programming and convexity constraint $\mathbf{11}'\boldsymbol{\lambda} = 1$ DEA model is derived in form:

$$\begin{aligned} \min_{\theta, \lambda} & \theta, \\ \text{st} & -q_i + Q \lambda \geq 0, \\ & \theta x_i - X \lambda \geq 0, \\ & \mathbf{11}'\boldsymbol{\lambda} = 1 \\ & \lambda \geq 0, \end{aligned}$$

where $\mathbf{11}$ is an $I \times 1$ vector of ones (Coelli et al, 2005). Linear programming problem must be solved I times, once for each DMU in the sample. A value of θ is then obtained for each DMU.

The proposed DEA model enable calculation of CRS and VRS models for each DMU, that presents technical efficiency (TE) and pure technical efficiency (PTE) respectively. Scale efficiency is the ratio of TE and PTE. If ratio is equal to 1 than DMU is scale efficient, otherwise results lower than 1 indicate scale inefficiency. Also TE and PTE are bounded by zero and one, where coefficient one stands for efficient DMU.

Results and discussion

Output products are multiple in dairy industry, but on input side the most important single input is raw milk. One of often proposed conditions to chose output and inputs is that their total number should not be bigger than one third of DMU-s number in sample (Cooper et al, 2001). As output variable is analyzed business revenue earned in 2015. Business revenue includes revenue from dairy products sold and revenue from commodities sold. The main commodity that dairy companies trade is raw milk. Business revenue is proved as more adequate output measure than profit. It is because profit varied strongly among dairy companies from year to year, and can be negative.

Chosen input variables used in DEA model cover all input side of dairy processing business. First one input variable is cost of material, which is dominant cost component in the most dairy companies. As input variable it includes cost of all purchased materials used in production process. In the structure of material cost, raw milk purchased from farmers have the biggest share. Cost of raw milk as main input could have share in total cost of dairy companies, ranging from 60% to 80%, depending on plant size and products structure (Popovic, Knezevic, 2010).

Second input, labour cost includes all range of cost varieties connected with labour used in dairy plant. According share in total production cost in dairy business it is second large cost. Third input is energy cost. All energy cost in raw milk transport, milk processing and transport of dairy products to market are included in this category. Fourth input variable is category of other costs. It includes five costs categories: depreciation, cost of purchased commodities, contracted services, non material cost, and interest paid.

Table 1. provide descriptive statistics for output input variables of dairy industry in Serbia during 2015. There is huge variation of data from micro to big dairy companies, while cost shares in each DMU are relatively stable. Data in Table 2 proves that situation with strong correlation coefficients between input variables and between inputs and output data.

Table 1. Descriptive statistics for variables of 91 DMU, used in DEA method.

Variable	Mean	Standard deviation	Minimum	Maximum
Return	649,136	2,704,763	136	24,758,079
Raw material	373,114	1,433,225	0	12,967,554
Labour	51,081	216,680	179	1,982,685
Energy	29,443	103,719	0	923,788
Other cost	155,606	680,643	195	6,236,403

Source: Data from financial statements of dairy companies published on SEBRA

The strongest correlation (Table 2) exist in relation revenue and material cost, what is expectable, since row milk as main input have 57% share in total cost of dairy plants for all DMUs. Sarkis (2007) propose that number of highly correlated inputs or outputs can be reduced in case of high correlation, but also warning that even in cases of perfect correlation of variables, results of efficiency estimate can slightly differ.

Table 2. Correlation analysis of input and output variables for 91 DMU.

	Revenue	Material cost	Labour cost	Energy cost	Other cost
Revenue	1				
Material cost	0.9966	1			
Labour cost	0.9932	0.9871	1		
Energy cost	0.9827	0.9817	0.9804	1	
Other cost	0.9921	0.9806	0.9845	0.96462	1

Source: Author's calculation based on SEBRA data.

DAEP 2.1 program (Coelli, 1996) was used to estimate DEA model with relative efficiency in sample of dairy processing companies in Serbia in 2015. Input - oriented multi stage model with variable return to scale was chosen for analysis. The results of CRS and VRS DEA models presents TE and PTE respectively. Scale efficiency is calculated as the ratio of TE and PTE.

The results of estimated DEA models for 91 DMUs, with CRS and VRS are presented in Table 3. Average TE calculated with CRS assumption is 0.838, where 15 DMUs scored $TE_{CRS} = 1$, mostly in groups of micro, small and middle sized dairy companies. Decomposition of TE_{CRS} on PTE and scale efficiency revealed additional set of results.

DEA model estimated with VCR assumption have slightly higher efficiency 0.878, while number of DMUs with $TE_{VRS} = 1$ increased to 24 DMUs, where additional increase comes from groups of big, middle sized and small dairy companies. Considering this model, treated as PTE, results imply that inefficient companies may reduce inputs without a reduction in output. It is particularly important in case of micro dairies which

are most input inefficient, and where inputs can be reduced for 14.7%. In group of small sized dairies inputs can be reduced by 9.3%, while in group of middle dairies inputs can be reduced for 4.8%, keeping same level of output. The two biggest dairies are proved as efficient in inputs use.

Table 3. Technical efficiency scores by DEA method of dairy processors in Serbia for 2015.

Enterprise size	DMU	CRS TE	VRS TE	Scale	
Micro	51	0.801	0.843	0.947	irs
Small	29	0.880	0.907	0.971	drs
Middle	9	0.895	0.952	0.941	drs
Big	2	0.929	1.000	0.929	drs
Mean:		0.838	0.878	0.954	drs

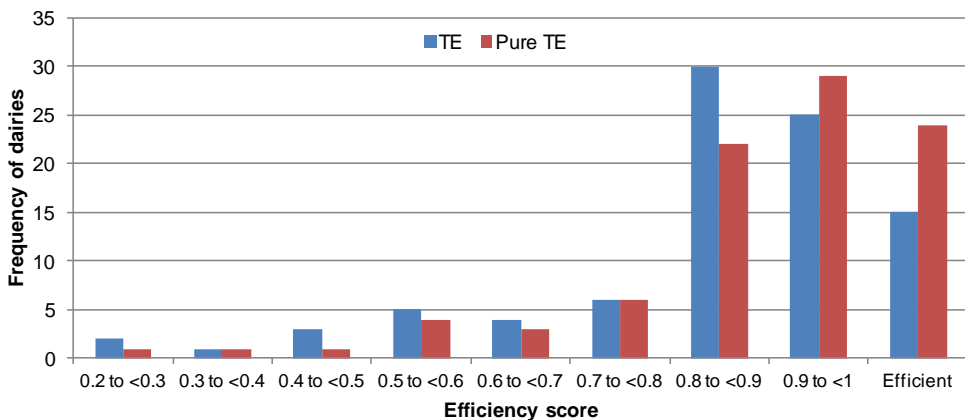
Source: DAEP 2.1 program results

All dairy companies beside those 15, which are technically efficient have another way to improve business results by changes in scale of business. Scale efficiency coefficients lower than one implying inefficiency. In the group of micro dairies (Table 3) the most of inefficient DMUs operate under increasing return to scale conditions. That is because those dairies are too small in its scale of operation, and way to increase its productivity is to increase size of business.

The most scale inefficient dairies in group of small, and all dairies in groups of middle and big dairy plants operate under decreasing return to scale conditions. 27 Companies from those three size groups are over dimensioned, i.e. above optimal productive scale. Approach to increase productivity to optimal level for this group of dairy companies is to decrease in size.

Two the biggest dairy companies have in average pure technical efficiency score, but they had the most to decrease in size to achieve optimal level of productivity.

Figure 1. Efficiency score distribution of 91 dairy companies in Serbia.



Source: Data obtained from DEA analysis.

In Graph 1 are presented efficiency score distribution. From all dairies in sample 21 company have more significant problem with TE scored lower than 0.8, while 16 of them have lower PTE than 0.8. Those farms are mainly from group of micro dairies, while several are from small and middle sized dairies. It is important to emphasise that efficient dairies exists in all range of company size.

Conclusions

The paper examine relative inter efficiency of Serbian dairy processing companies. The empirical results reveal differences in technical efficiency scores among dairy companies through size groups. Only 15 companies are efficient with extension on 24 that have pure technical efficiency. The two different approaches to increase efficiency were identified. First, to make input reduction, keeping same level of output, what is especially important for micro and small dairies, with smaller effect on middle dairies. Second approach, is to change size of business to optimal level. The most of inefficient dairies in group of micro should to increase size of business, while all big and middle, as well as most of inefficient small dairies had to decrease size of business to optimal level of productivity.

Chosen input and output variables represent well dairy business. Input variables used in model cover all cost structure in milk processing industry. Strong correlation between inputs used in model were expectable since cost shares in dairy industry are stable.

Although, different business strategies of dairy companies were identified through research, in this paper its technical efficiency were not analysed according applied strategies. Another recommendation or open question for further research is how to decompose inputs and outputs on price and quantity, what will enable analysis of economic efficiency in dairy sector.

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Conflict of interests

The authors declare no conflict of interest.

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CORRELATION AND REGRESSION ANALYSIS OF THE IMPACT OF LEASING ON AGRICULTURAL PRODUCTION IN REPUBLIC OF SERBIA

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ABSTRACT

The paper explores the impact of leasing in agriculture on agricultural production in the Republic of Serbia by means of correlation and regression analysis. The research was conducted in the period between 2006 and 2016. The authorized data from National Bank of Serbia and Statistical Office of the Republic of Serbia were used in the paper. With the aim of carrying out a more comprehensive research, the paper analyzes the impact of leasing placement on the following economic accounts for agriculture: Output of agricultural industry, Intermediate consumption, Gross value added, Agricultural goods output, and Factor income.

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Introduction

Numerous authors have dealt with the definition of agriculture, its divisions and interpretations. Bogdanović (1967) divides agriculture into a) agro-technical and economic; b) extensive and intensive. There is also an interpretation of agriculture in its narrower and broader sense (Radović, 2014). Agriculture in its narrower sense involves agricultural production for one's own needs, while agriculture in its broader sense implies horizontal and vertical connection of economic fields and industries. Agricultural production interconnected in this way is commonly known as agro-industrial complex (the term is used in domestic and Eastern-European literature) or agro-business (which is the term used in Western-European literature).

Leasing, as one of potential methods of financing agriculture, represents a form of business deal whereby a leasing provider gives the leasing recipient a particular object to use, under the condition of payment of the agreed amount of money in the form of installments. The leasing provider has the ownership over the object of the leasing until

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it is paid off (Paraušić, Cvijanović, 2007). Leasing, as a modern method of financing, was first used in the 50s of the 20th century in the US. On the territory of Republic of Serbia, the financial leasing business is legally regulated by The Law on Financial Leasing (The Official Gazette no. 55/2003) adopted in May 2003, and its amendment from 2005 (The Official Gazette no. 61/2005). National Bank of Serbia supervises the operations of financial leasing providers and undertakes corrective measures. The applicable law that is still in force today is the Law on Financial Leasing (The Official Gazette of RS no. 55/2003, 61/2005, 31/2011, 99/2011 etc.).

Although leasing market is not sufficiently represented and developed in Serbia, this sector still occupies an increasingly important place in financing agriculture. It can be said that leasing in the procurement of equipment and machinery for the needs of agricultural production has been sufficiently accepted by farmers. Their increasing awareness and education certainly contribute to that fact. In that way they can take full advantage of leasing benefits compared with traditional crediting, with the benefits referring primarily to a lower interest rate (Grujić, 2017).

Foreign economists' body of research (Brealey et al., 2001) points to three types of leasing:

- direct leasing when a company buys goods from manufacturers;
- operational leasing creates the responsibility of the object of leasing maintenance by the leasing provider, who is responsible for taxes and insurance; the leasing provider has the right to cancel the leasing before the expiry of the agreed date and the leasing recipient returns the object of the lease and ceases to repay the installments;
- financial leasing, which implies that the leasing recipient bears the costs of taxation, insurance and damage; leasing cannot be cancelled, but in case of cancellation the leasing recipient is obliged to pay the penalties and settle obligations arising from leasing.

The paper analyzes the impact of financial leasing. There are 16 registered institutions in the Republic of Serbia that operate as leasing providers. All these institutions place their assets into leasing in agriculture as well. Analyzing the period from 2006 to 2016, the impact of leasing was examined on the following economic accounts for agriculture: Output of agricultural industry, Intermediate consumption, Gross value added, Agricultural goods output, and Factor income.

The Methodology of the applied analysis

The paper analyzes the cumulative impact of leasing placement in agriculture in the period from 2006 to 2015 on the trends of certain Economic Accounts for Agriculture (EAA) in the period from 2007 to 2016.

The cumulative impact of the leasing placement in Agriculture, forestry and fishing sector and the cumulative impact of leasing placement in Agricultural equipment in

the given period were analyzed in parallel. Data on annual leasing placements were taken from the annual reports of the Department for supervision of financial leasing operations, and the Department for supervision of operations of banks of National Bank of Serbia. The used data are available on the National Bank of Serbia official website (NBS, 2006-2016).

The leasing placement is analyzed in the following Economic Accounts for Agriculture: Output of agricultural industry, Intermediate consumption, Gross value added, Agricultural goods output and Factor income⁴.

The reason for the selection of the mentioned economic accounts for agriculture lies in the fact that they can help examine the impact of the cumulative leasing placement on the volume of produced agricultural goods (in the form of impact on the Output of agricultural industry and on the Agricultural goods output), on the volume of costs during total agricultural production (in the form of the impact on Intermediate consumption) and on the volume of profit before taxation and subsidies (in the form of impact on Gross value added) and after taxation and subsidies (in the form of impact on Factor income).

Data on the aforementioned economic accounts for agriculture were taken from the working document entitled Economic Accounts for Agriculture in RS 2007-2016 (SORS, 2017).

Changes in the volume of these economic accounts for agriculture outputs were analyzed, depending on the cumulative leasing placement in agriculture. These economic accounts are presented in this document in the form of a Laspeyres Index, with weights from the previous year. The series weighted in this way cannot be used to calculate real growth, because the data by years are not comparable. In order to obtain a series of comparable data, a chain-linking method is used, whereby data is reduced to one reference year, thus obtaining a comparable time series of data which correctly represents the value change in the volume of interest. This is how the chain-linked measures of volume are obtained. According to Eurostat recommendations, the year of 2010 is taken as a reference year.

Such chain-linked data (SORS, 2017) are significant for the Output of agricultural industry, Intermediate consumption and Gross value added, while the cross-linked data for the Agricultural goods output and Factor income are interpolated, assuming that their chain-linking is proportional to chain-linking of the Output of agricultural industry.

4 Output of agricultural industry is equal to the sum of the value of crop production, animal production, agricultural services and value of production from inseparable non-agricultural secondary activities on the holdings. Intermediate consumption is the value of all goods and services used as inputs in the agricultural production process. It is valued at the purchaser prices. Gross value added at basic prices is equal to the difference between the value of agricultural production (output of the agricultural 'industry') at basic prices and intermediate consumption at purchaser prices. Agricultural goods output is the value of production of all agricultural goods (crop and animal production). Factor income is equal to the difference between net value added at basic prices and consumption of fixed capital less taxes on production, plus subsidies on production (SORS, 2017).

Regardless of the fact that this is not exactly the exact reduction to their weight from 2010, it was assumed that for this type of analysis the correction was negligible, which, as it will be shown, will not be denied by the results. The interpolation was performed because the cross-linked data for the Agricultural goods output and Factor income did not exist in the above mentioned working document.

The cumulative impact of leasing placement in agriculture on the above-mentioned Economic accounts for agriculture was analyzed by means of correlation and regression analysis. Namely, the correlation and regression dependence of the given accounts in agriculture in the i -th year ($i = 2007, 2008, \dots, 2016$) was found on the sum of the placed leased assets in agriculture from 2006 to $(i-1)$ year, since it can be expected, for example, that the sum of all placed leased assets in agriculture from 2006-2013 should influence, to some extent, the produced agricultural goods output in 2014. This influence, if any, is not large, primarily for two reasons. The first is that agricultural activity in our country has for years been of similar characteristics in a macro sense and that it has mostly depended on climatic conditions. The second is that the amount of leased assets in agriculture in the period 2006-2015 was low compared to intermediate consumption in the process of agricultural production. At the annual level, the leased assets in agriculture are somewhere around 3-5% of the intermediate annual consumption in agriculture (see Table 1 and Table 2).

Tabular and graphical representation of used data

In Table 1 the chain-linked values of the analyzed economic accounts for agriculture are given in million RSD, in the period 2007-2016 on the territory of the Republic of Serbia. The base year is 2010.

Table 1. Chain-linked values for the base year of 2010 in mil. RSD

Year	Output of agricultural industry	Intermediate consumption	Gross value added	Agricultural goods output	Factor income
2007	432,951.8	251,217.3	182,960.3	384,831.2	158,072.4
2008	473,449.9	273,818.8	201,006.2	428,613	197,108.2
2009	491,734.7	278,449.4	214,477.9	442,993.5	184,050.7
2010	498,776.4	295,276.6	203,499.7	455,752.7	186,000.4
2011	505,305.7	292,802.2	212,503.5	456,046.5	189,443.3
2012	420,630.7	269,271.2	152,184.7	380,868.3	160,462.7
2013	492,445.4	289,411.1	198,120.5	436,462.8	185,424.7
2014	538,643.2	316,582.3	216,687	478,444.1	203,726.2
2015	506,934.7	294,041.8	207,749.2	448,409.5	196,448.8
2016	554,376.5	319,362.9	229,409.1	492,031	210,947

Source: The authors' research based on Economic Accounts in Agriculture in 2007-2016

Table 1 points to the well-known fact that the negative impact of bad climate conditions in 2012 was crucial for the reduced volume of agricultural goods production in that year. Therefore, in addition to the complete time series, the analysis was also conducted for the time series excluding the values of the Economic accounts for agriculture in 2012,

since without the data from that year, the sensitivity of the change of the Economic accounts for agriculture from the cumulative value of leasing in agriculture is higher.

The following *Table 2* contains the annual and cumulative values of leasing assets placement in two agricultural categories on the territory of the Republic of Serbia.

Table 2. Annual and cumulative leasing placement in mil. RSD

Year	Annual leasing placement in Agriculture, forestry and fisheries sector	Cumulative leasing placement in Agriculture, forestry and fisheries sector	Annual leasing placement in Agricultural equipment	Cumulative leasing placement in Agricultural equipment
2006	8,530.5	8,530.5	7,379.6	7,379.6
2007	11,241.3	19,771.8	8,764.3	16,143.9
2008	16,421.8	36,193.6	10,171.7	26,315.6
2009	14,470.8	50,664.4	8,682.5	34,998.1
2010	8,005.6	58,670	6,720.7	41,718.8
2011	5,133.7	63,803.7	5,133.7	46,852.5
2012	5,039.1	68,842.8	6,550.9	53,403.4
2013	6,071.6	74,914.4	5,869.2	59,272.6
2014	6,347.6	81,262	6,413.1	65,685.7
2015	4,760.9	86,022.9	5,484.1	71,169.8

Source: The authors' research based on SORS and NBS data

The first category involves leasing placement in Agriculture, forestry and Fisheries sector, while the second refers to leasing placement in Agricultural equipment in the period 2006-2015. The data shown are in mil. RSD. The analysis was conducted for both categories of leasing assets investment, regardless of the fact that these categories are largely intertwined, in order to verify more effectively the existence of the impact of leasing placement in agriculture on the volume of produced agricultural goods.

The results of regression and correlation analysis

The correlation and regression analysis of the dependence of the volume of the above mentioned agricultural accounts on the cumulative leasing placement into Agriculture, forestry and fisheries sector, and on the leasing placement into Agricultural equipment, was conducted by means of MATLAB software package. The dependence for the period 2007-2016 was obtained in two ways.

The first one includes all the data of the Economic accounts and the cumulative leasing placement in that period, and the second one the situation excluding all data from 2012, because that was extremely bad year for the production of agricultural goods, mostly due to very poor climatic conditions. Of course, for the cumulative leasing values for 2013, the values of leasing placement in 2012 were still used.

In both cases, the dependence of change is highly linear, so that a simple linear regression analysis is applied everywhere.

-The dependence of Output of agricultural industry on cumulative leasing placement

Simple linear regression dependence of Output of agricultural industry on Cumulative leasing placement into the Agriculture, forestry and fisheries sector equals:

-all data from the series

Output of agricultural industry (mil. RSD) = 0.9201 * Cumulative leasing (mil.RSD) + 4.371 * 10⁵with determination coefficient $R^2= 0.389$ and with p value being $p = 0.0539$ (see Figure 1).

- excluding data from 2012

Output of agricultural industry (mil. RSD) = 1.1237 * Cumulative leasing (mil.RSD) + 4.3886 * 10⁵with determination coefficient $R^2= 0.771$ and with p value being $p = 0.00185$ (see Figure 2).

Figure 1. With data from 2012

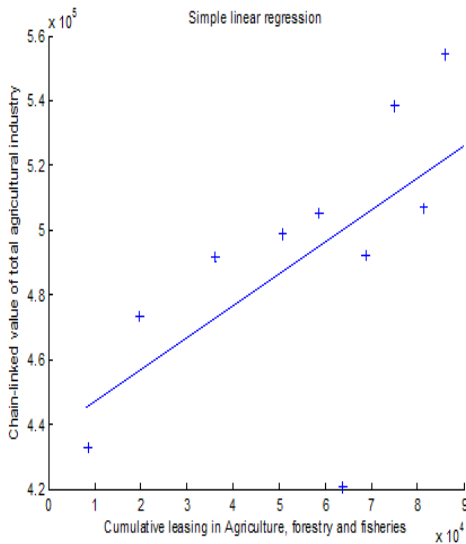
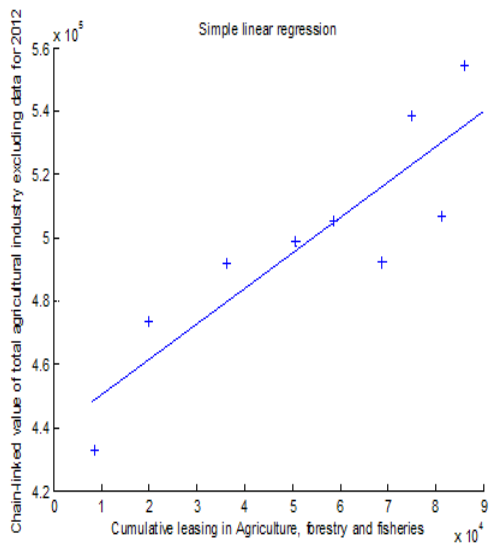


Figure 2. Excluding data from 2012



Source: The authors' research (MATLAB software package)

Simple linear regression dependence of Output of agricultural industry on Cumulative leasing placement into Agricultural equipment equals:

- all data from the series

Output of agricultural industry (mil. RSD) = 1.271 * Cumulative leasing (mil.RSD) + 4.3777 * 10⁵with determination coefficient $R^2= 0.421$ and with p value being $p = 0.0423$ (see Figure3).

-excluding data from 2012

Output of agricultural industry (mil. RSD) = $1.368 * \text{Cumulative leasing (mil.RSD)} + 4.4223 * 10^5$ with determination coefficient $R^2 = 0.76$ and with p value being $p = 0.00218$ (see Figure 4).

Figure 3. With data from 2012

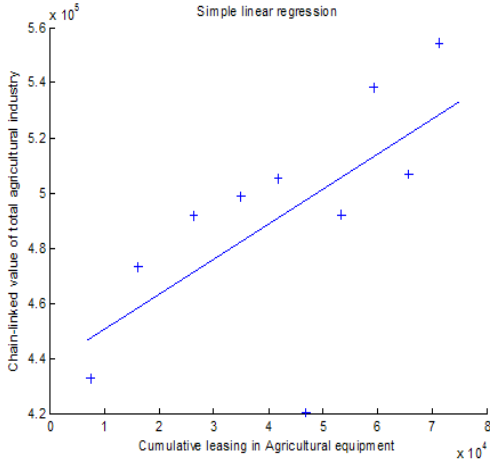
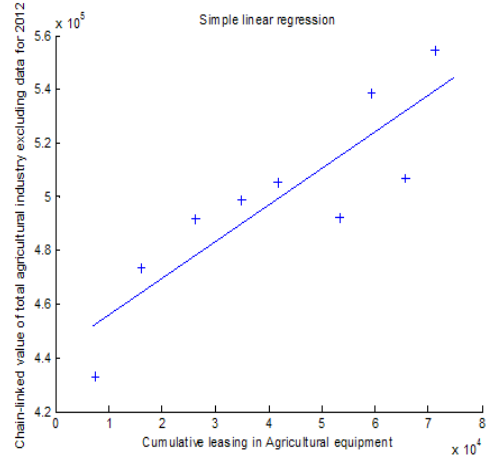


Figure 4. Excluding data from 2012



Source: The authors' research (MATLAB software package)

-The dependence of Intermediate consumption on Cumulative leasing placement

Simple linear regression dependence of Intermediate consumption on Cumulative leasing placement into **Agriculture, forestry and fishing industries** equals:

-all data from the series

Intermediate consumption (mil. RSD) = $0.644 * \text{Cumulative leasing (mil. RSD)} + 2.527 * 10^5$ with determination coefficient $R^2 = 0.647$ and with p value being $p = 0.00503$ (see Figure 5).

- excluding data from 2012

Intermediate consumption (mil. RSD) = $0.6843 * \text{Cumulative leasing (mil. RSD)} + 2.5324 * 10^5$ with determination coefficient $R^2 = 0.8$ and with p value being $p = 0.00113$ (see Figure 6).

Figure 5. With data from 2012

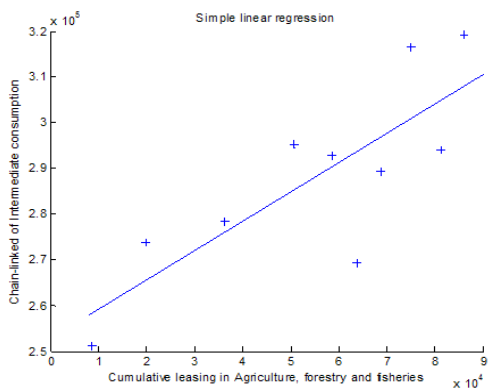
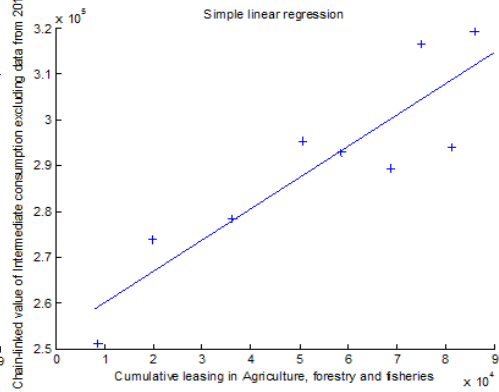


Figure 6. Excluding data from 2012



Source: The authors' research (MATLAB software package)

Simple linear regression dependence of Intermediate consumption on Cumulative leasing placement into Agricultural equipment equals:

-all data from the series

Intermediate consumption (mil. RSD)=0.799*Cumulative leasing(mil. RSD)+2.5425*10⁵with determination coefficient $R^2=0.656$ and with p value being $p=0.00449$.(see Figure 7).

- excluding data from 2012

Intermediate consumption (mil. RSD)=0.827* Cumulative leasing(mil. RSD)+2.555*10⁵with determination coefficient $R^2=0.777$ and with p value being $p=0.00167$ (see Figure 8).

Figure 7. With data from 2012

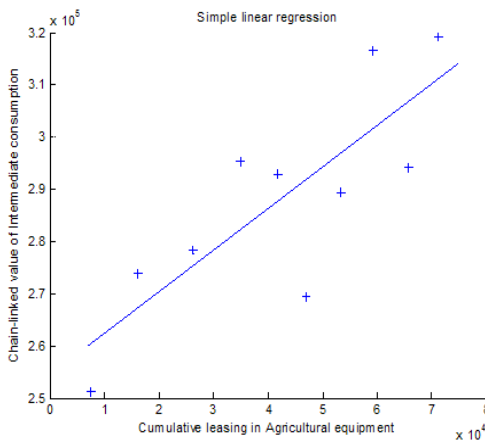
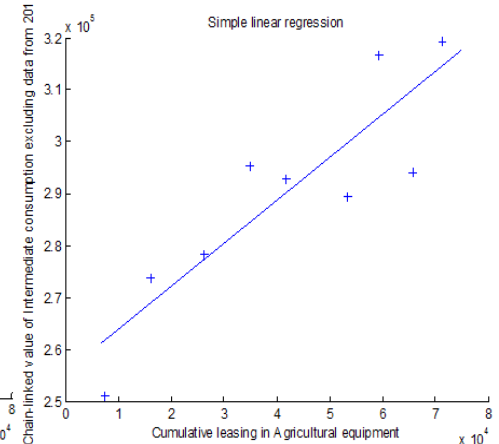


Figure 8. Excluding data from 2012



Source: The authors' research (MATLAB software package)

-The dependence of the value of Gross value added on Cumulative leasing placement

Simple linear regression dependence of Gross value added on Cumulative leasing placement into Agriculture, forestry and fishing industries equals:

-all data from the series

Gross value added (mil. RSD)=0.249* Cumulative leasing (mil.RSD)+1.8821*10⁵with determination coefficient $R^2=0.0915$ and with p value being $p=0.396$ (see Figure 9).

- excluding data from 2012

Gross value added (mil. RSD)=0.3344* Cumulative leasing (mil.RSD)+1.8936*10⁵with determination coefficient $R^2=0.485$ and with p value being $p=0.0371$ (see Figure 10).

Figure 9. With data from 2012

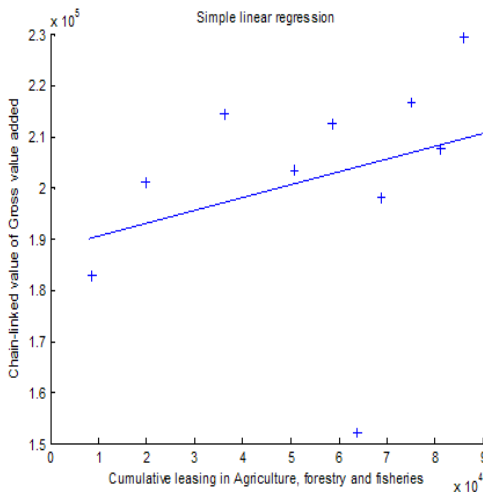
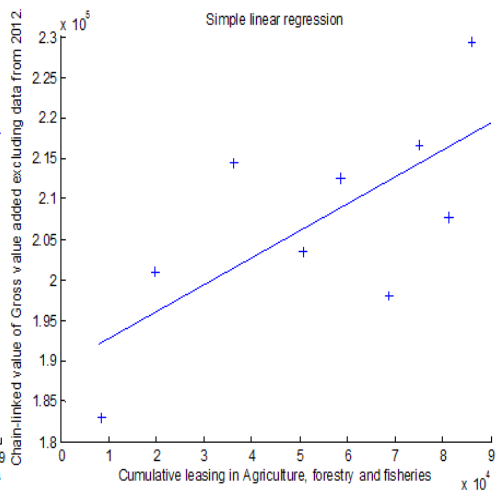


Figure 10. Excluding data from 2012



Source: The authors' research (MATLAB software package)

Simple linear regression dependence of Gross value added on Cumulative leasing placement in Agricultural equipment equals:

-all data from the series

Gross value added (mil. RSD)=0.343* Cumulative leasing (mil.RSD)+1.8736*10⁵with determination coefficient $R^2=0.115$ and with p value being $p=0.339$ (see Figure 11).

-excluding data from 2012

Gross value added (mil. RSD)=0.408* Cumulative leasing (mil.RSD)+1.9035*10⁵with determination coefficient $R^2=0.48$ and with p value being $p=0.0387$ (see Figure 12).

Figure 11. With data from 2012

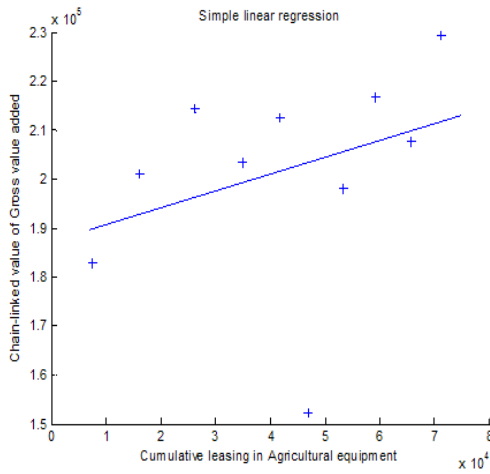
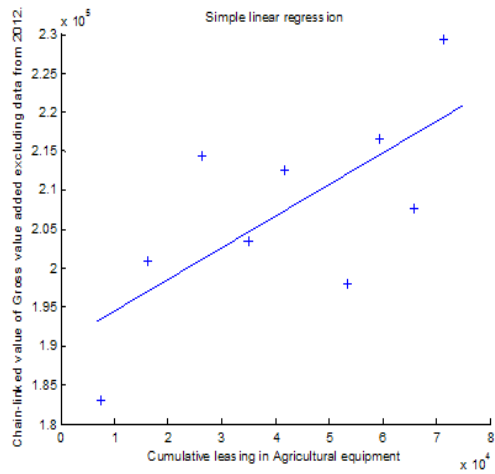


Figure 12. Excluding data from 2012



Source: The authors' research (MATLAB software package)

-The dependence of the value of Total agricultural goods output on Cumulative leasing placement

Simple linear regression dependence of Total agricultural goods output on Cumulative leasing placement into Agriculture, forestry and fishing industries equals:

-all data from the series

Agricultural goods output (mil. RSD) = 0.808 * Cumulative leasing (mil.RSD) + 3.9612 * 10⁵ with determination coefficient $R^2=0.348$ and with p value being $p= 0.0727$ (see Figure 13).

-without data from 2012

Agricultural goods leasing output (mil. RSD) = 0.918 * Cumulative leasing (mil.RSD) + 3.9761 * 10⁵ with determination coefficient $R^2=0.675$ and with p value being $p=0.00658$ (see Figure 14).

Figure 13. With data from 2012

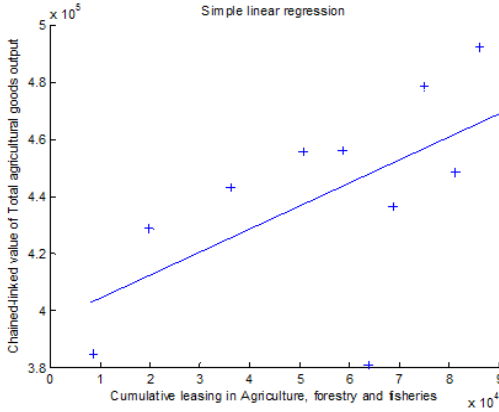
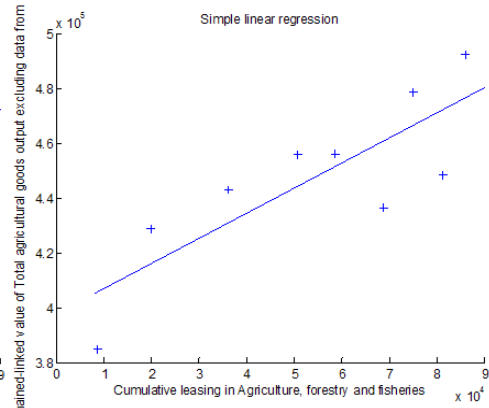


Figure 14. Excluding data from 2012



Source: The authors' research (MATLAB software package)

Simple linear regression dependence of Total agricultural goods output on Cumulative leasing placement into Agricultural equipment equals:

-all data from the series

Agricultural goods output (mil. RSD) = 1.017 * Cumulative leasing (mil.RSD) + 3.9742*10⁵with determination coefficient $R^2= 0.364$ and with p value being $p= 0.0649$ (see Figure 15).

-excluding data from 2012

Agricultural goods output (mil. RSD) = 1.0986 * Cumulative leasing (mil.RSD) + 4.0116 * 10⁵with determination coefficient $R^2=0.643$ and with p value being $p= 0.00929$ (see Figure 16).

Figure 15. With data from 2012

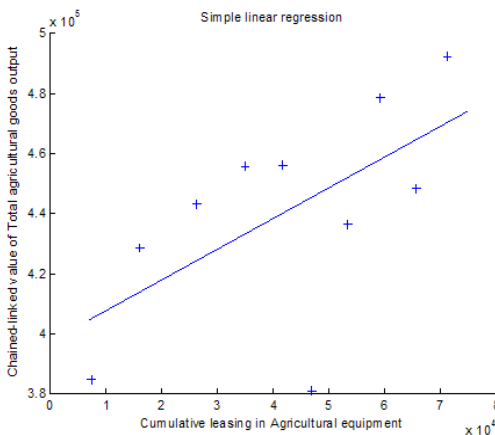
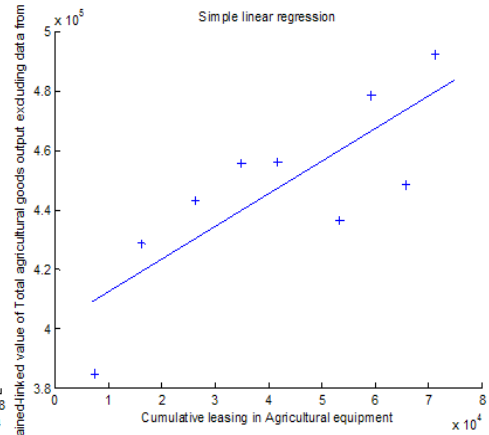


Figure 16. Excluding data from 2012



Source: The authors' research (MATLAB software package)

-The dependence of Factor income value on Cumulative leasing placement

Simple linear regression of Factor income on Cumulative leasing placement into Agriculture, forestry and fisheries sector equals:

-all data from the series

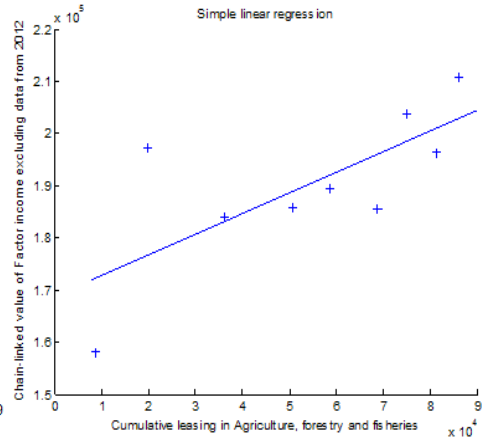
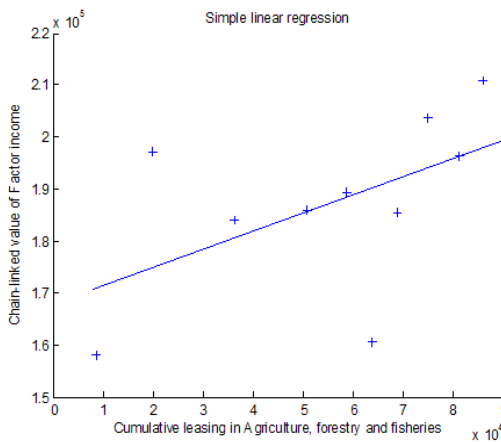
Factor income (mil. RSD)=0.348* Cumulative leasing (mil.RSD)+1.6806*10⁵with determination coefficient $R^2=0.284$ and with p value being $p=0.112$ (see Figure 17).

-excluding data from 2012

Factor income (mil. RSD)=0.397* Cumulative leasing (mil.RSD)+1.6872*10⁵with determination coefficient $R^2=0.525$ and with p value being $p= 0.0273$ (see Figure 18).

Figure 17. With data from 2012

Figure 18. Excluding data from 2012



Source: The authors' research (MATLAB software package)

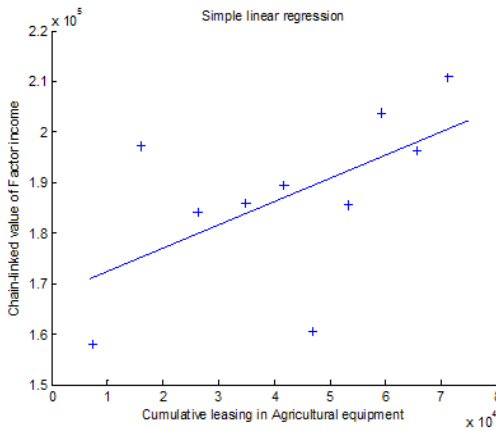
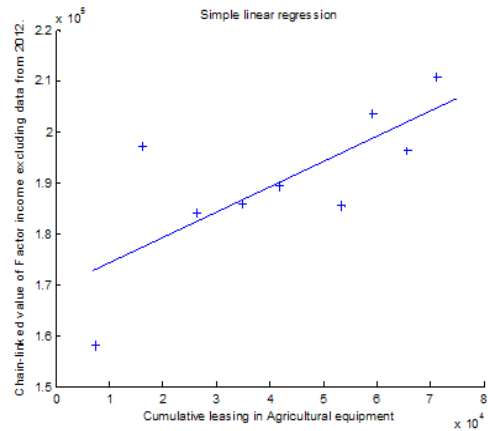
Simple linear regression dependence of Factor income on Cumulative leasing placement in Agricultural equipment equals:

-all data from the series

Factor income (mil. RSD)=0.461*Cumulative leasing (mil.RSD)+1.6766*10⁵with determination coefficient $R^2=0.329$ and with p value being $p=0.083$ (see Figure 19).

-excluding data from 2012

Factor income (mil. RSD)=0.498* Cumulative leasing (mil.RSD)+1.6934*10⁵with determination coefficient $R^2=0.547$ and with p value being $p=0.0227$ (see Figure 20).

Figure 19. With data from 2012**Figure 20.** Excluding data from 2012

Source: The authors' research (MATLAB software package)

The analysis of the obtained results

As already mentioned, leasing placement into agriculture at the annual level is around 3-5% of Intermediate annual consumption in agriculture. The total ten-year cumulative leasing placement (2006-2015) in Agriculture, Forestry and Fisheries sector is 29.13% of the Intermediate annual consumption only in 2010. As for the placement in Agricultural equipment, this percentage is 24.10% (see *Table 1* and *Table 2*).

Therefore, one should not expect large influence of leasing on the absolute values of agricultural outputs, as they are mostly determined by agricultural capacities in the Republic of Serbia and climatic conditions during the current year. Therefore, the value of the constant in all obtained regression dependencies is (about 10 times) bigger than the value of the variable member. The constant is, roughly speaking, the measure of agricultural potential and climatic conditions, while the variable is the measure of the impact of cumulative leasing on agricultural outputs.

The impact of cumulative leasing in agriculture on the volume of agricultural production was analyzed by means of its impact on the output of agricultural industry and on the total agricultural goods output from 2007-2016. In that period, the output of agricultural industry increased by 28.05%, and the total agricultural goods output by 27.86%.

Table 3 shows the parameters of regression analysis for the Output of agricultural industry and for the Total agricultural goods output.

Table 3. The parameters of regression analysis for the Output of agricultural industry and for the Total agricultural goods output

The parameters of regression analysis	The output of agricultural industry				Total agricultural goods output			
	Data from all years in the period 2007-2016		Excluding data from 2012		Data from all years in the period 2007-2016		Excluding data from 2012	
	Cumulative leasing in Agriculture, Forestry and fisheries sector	Cumulative leasing in Agricultural equipment	Cumulative leasing into Agriculture, Forestry and fisheries sector	Cumulative leasing in Agricultural equipment	Cumulative leasing in Agriculture, Forestry and fisheries sector	Cumulative leasing in Agricultural equipment	Cumulative leasing in Agriculture, Forestry and fisheries sector	Cumulative leasing in Agricultural equipment
p-value	0.0539	0.0423	0.00185	0.00218	0.0727	0.0649	0.00658	0.00929
Determination coefficient R ²	0.389	0.421	0.771	0.76	0.348	0.364	0.675	0.643

Source: Authors' research

By analyzing the obtained results and p-values from Table 3 it can be concluded that the dependence of the change in the Output of agricultural industry and Total agricultural goods output on Cumulative leasing into the Agriculture, forestry and fisheries sector and on Cumulative leasing in Agricultural equipment is subject to the law of positive linear regression. In addition, a more credible linear dependence is obtained if the analysis does not include data for the year in which the climatic conditions were predominantly bad for agricultural output (2012), than when they are used in the analysis.

In fact, p-values excluding data from 2012 are 0.00185, 0.00218, 0.00658, and 0.0092, in which case linear regression dependence describes changes with a probability higher than 0.99, which is absolutely acceptable, while p-values including data from 2012 are 0.0539, 0.0423, 0.0727, 0.0649, and then linear regression dependence describes changes with probabilities from 0.927 to 0.957, which is on the verge of acceptability.

In the case when the data from 2012 were used, when the climatic conditions were predominantly bad, the change in the Output of agricultural industry and Total agricultural goods output, depending on Cumulative leasing in agriculture, is not high. More precisely, in that case about 40% of the change in the Output of agricultural industry is described by the obtained positive linear regression dependence, since the determination coefficients R² are equal to 0.389 and 0.421, while about 35% of the change in Total agricultural goods output is described by the obtained positive linear regression dependence, with the determination coefficients R² being 0.348 and 0.364.

When data from 2012 are excluded, significant impact of Cumulative leasing in agriculture is detected on the change in Output of agricultural industry and Total agricultural goods output. In that case about 76.5% of the change in the Output of agricultural industry is described by the obtained positive linear-regression dependence, since the determination coefficients R² are equal to 0.771 and 0.76, while about 66% of the change in Total agricultural goods output is described by the obtained positive linear-regression dependence, with the determination coefficients R² being 0.675 and 0.643.

The impact of Cumulative leasing in agriculture on the volume of costs during total agricultural goods output was analyzed by means of its impact on Intermediate consumption in the period from 2007 to 2016. During this period, the Intermediate consumption increased by 27.13%. Table 4 shows the parameters for regression analysis for Intermediate consumption.

Table 4. The parameters for regression analysis for Intermediate consumption

The parameters of regression analysis	Intermediate consumption			
	Data from all years in the period 2007-2016		Excluding data from 2012	
	Cumulative leasing in Agriculture, forestry and fisheries sector	Cumulative leasing in Agricultural equipment	Cumulative leasing in Agriculture, forestry and fisheries sector	Cumulative leasing in Agricultural equipment
p-value	0.00503	0.00449	0.00113	0.00167
Determination coefficient R ²	0.647	0.656	0.8	0.777

Source: Authors' research

By analyzing the obtained results and p-values from *Table 4*, it can be concluded that the dependence of the change in Intermediate consumption on Cumulative leasing in Agriculture, forestry and fisheries sector and on Cumulative leasing in Agricultural equipment is subject to the law of positive linear regression. In addition, a slightly more reliable linear dependence is obtained if the analysis excludes data from the year when climatic conditions were predominantly bad for agricultural output (2012), than when they are used in the analysis.

In fact, p-values excluding data from 2012 equal 0.00113, 0.00167, while p-values including data from 2012 are 0.00503, 0.00449. In both cases, linear regression dependence describes changes with a probability higher than 0.99, which is absolutely acceptable.

Also, both with and without data from 2012, a significant impact of Cumulative leasing in agriculture on the change in Intermediate consumption is detected. Including data from 2012, about 65% of the change in Intermediate consumption is described by the obtained positive linear regression dependence, since the determination coefficients R² are equal to 0.647 and 0.656. On the other hand, excluding data from 2012, about 79% of the change in Intermediate consumption is described by the obtained positive linear regression dependence, with the determination coefficients R² being 0.8 and 0.777.

The impact of cumulative leasing in agriculture on the volume of realized profit before taxation and subsidies was analyzed by means of its impact on Gross value added, and on the volume of realized profits after taxation and subsidies by means of impact on Factor Income in the period 2007-2016. In that period, Gross value added increased by 25.39% and Factor income by 33.45%. Table 5 shows the parameters of the regression analysis for Gross Value Added and Factor Income.

Table 5. The parameters of the regression analysis for Gross Value Added and Factor Income

The parameters of regression analysis	Gross value added				Factor income			
	Data from all years in the period 2007-2016.		Excluding data from 2012		Data from all years in the period 2007-2016		Excluding data from 2012	
	Cumulative leasing in Agriculture, forestry and fisheries sector	Cumulative leasing in Agricultural equipment	Cumulative leasing into Agriculture, forestry and fisheries sector	Cumulative leasing in Agricultural equipment	Cumulative leasing in Agriculture, forestry and fisheries sector	Cumulative leasing in Agricultural equipment	Cumulative leasing in Agriculture, forestry and fisheries sector	Cumulative leasing in Agricultural equipment
p-value	0.396	0.339	0.0371	0.0387	0.112	0.083	0.0273	0.0227
Determination coefficient R ²	0.0915	0.115	0.485	0.48	0.284	0.329	0.525	0.547

Source: Authors' research

Analyzing the obtained results and p-values from Table 5 it is concluded that the dependence of the change in the Gross value added and Factor income on Cumulative leasing in Agriculture, forestry and fisheries sector and on Cumulative leasing in Agricultural equipment are subject to the law of positive linear regression only for the data from 2012. Then the p values equal 0.0371, 0.0387, 0.0273, 0.0227. However, this linear dependence of the change is not significant, since the determination coefficients R² are not large (0.485, 0.4, 0.525, 0.547).

If the data from 2012 are included, the existence of a linear regression dependence of the change in Gross value added and Factor income on Cumulative leasing in Agriculture, forestry and fisheries sector and on Cumulative leasing in Agricultural equipment is not detected, as p-values are inadmissibly high (0.396, 0.339, 0.112, 0.083).

Conclusion

The placement of leasing in agriculture from 2006 to 2017 affected the volume of agricultural goods production. This impact is, to a greater or lesser extent, positively linearly correlated with agricultural outputs. In absolute terms, it is not large, because leasing placement in agriculture at the annual level ranges from 3 to 5% of the Intermediate annual consumption in agriculture. Also, the total ten-year cumulative leasing placement (2006-2015) in Agriculture, forestry and fisheries sector is 29.13% of the Intermediate annual consumption only in 2010. For the placement in Agricultural equipment, this percentage is 24.10%.

Absolute values of agricultural outputs are mostly determined by agricultural capacities in the Republic of Serbia and climatic conditions during the current year. The analysis has shown that the impact of cumulative leasing on agricultural output is about ten times lower than the impact of climate conditions and agricultural potential of the Republic of Serbia.

The volume of agricultural production in the period 2007-2016, expressed by means of the Output of agricultural industry and Total agricultural goods output, individually, is in positive linear correlation with Cumulative leasing in agriculture in the period 2006-2015. Even the bad climatic conditions in 2012 did not affect the form of dependence, but only the size of the impact.

In fact, in the case when the data from 2012 were used, when the climatic conditions were predominantly bad, about 40% of the change in the Output of agricultural industry and about 35% of the change in the Total agricultural goods output was described by positive linear-regression dependencies.

When data from the mentioned year were not used, about 76.5% of the change in the Output of agricultural industry and about 66% of the change in the total agricultural goods output was described by positive linear-regression dependencies.

This is another indicator of the strong impact of bad annual climate conditions on the volume of annual agricultural production.

The volume of costs during agricultural production in the period 2007-2016 expressed through the Intermediate consumption is also positively linearly correlated with the cumulative leasing placement in agriculture in the period 2006-2015, regardless of the bad climatic conditions in 2012.

If data from 2012 are included, about 65% of the change of Intermediate consumption was described by the obtained positive linear-regression dependence. On the other hand, without data from 2012, about 79% of the change of Intermediate consumption was described by the obtained positive linear-regression dependence. This proves that poor climatic conditions from 2012 did not significantly affect further investment in agriculture.

Bad climatic conditions from 2012 completely excluded in the impact of cumulative leasing placement in agriculture on the volume of realized profit. For that year no correlation dependence of either Gross value added (the measure of the volume of realized profit without taxes and subsidies) or Factor income (the measure of the volume of realized profit with taxes and subsidies) on cumulative leasing placement in agriculture was detected.

The analysis of the data from a bad climatic year has shown that the linear correlation between Gross value added and cumulative leasing in agriculture, as well as between Factor income and cumulative leasing in agriculture, exists but is not dominant. This is a good indicator of the strong impact of climatic conditions on the volume of realized profit in agriculture.

Therefore, a general conclusion is that leasing placement in the agricultural sector in the period 2006-2015 had a positive impact on the growth of the volume of agricultural production in the period 2007-2016, as well as the increase in Intermediate consumption during the agricultural production process, while it had no noticeable impact on the volume of realized profit in agriculture in that period. In absolute terms this impact is not huge, since the agricultural production capacity of the Republic of Serbia and the annual climatic conditions are dominant for agricultural outputs, and it ranges up to 10% of the total agricultural output.

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Conflict of interests

The authors declare no conflict of interest.

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DEVELOPMENT OF DERIVATIVE TRADING ON FINANCIAL MARKET AND AGRIBUSINESS SECTOR IN SERBIA

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ABSTRACT

Transactions with futures and other derivatives began their development in the XIX century on the exchanges in USA and other developed countries, but financial market in Serbia is still underdeveloped with exchange materials, volumes and number of participants. Investors on the Belgrade Stock Exchange mostly trade with stocks and government bonds. Also, Agrar Product Novi Sad has organized only spot trading of agricultural products. The paper goal is to present all relevant assumptions and significance of derivative trading development in Serbia with discussion about choice to start derivative trading on the already existing exchanges or to establish a new futures exchange that is going to be specialized for derivative trading. As the research method authors use content analysis and comparison of significant national and foreign literature with analyses of trading volumes on international and domestic exchanges. Authors recommend that Agrar Product Novi Sad be the first in expansion of market listing with commodity futures and options. On this way market is going to be deeper, creating efficient mechanisms for investor's protection from price risks, creating conditions for safer and long term production planning, with increase in market attractivity that could set the Agrar Product Novi Sad as a leader in commodity derivative trading in the South-East Europe

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Introduction

According to ISDA Quarterly, derivatives play a critical role in helping firms to reduce the uncertainty that comes from changing interest rates and currency markets. Whether used by global companies to eliminate exchange rate risk on foreign currency earnings, by pension funds to hedge inflation and interest rate risk in long-dated pension liabilities, or

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by governments to reduce interest rate risk on new bond issuance, derivatives allow end users to offset risks they face and to create certainty and stability in financial performance. With use of derivatives firms can invest in the future with greater confidence, creating jobs and contributing to economic growth. This activity is primarily driven by trades with companies, banks, pension funds and governments. For instance, a company might decide to issue debt to finance an expansion of its business, and use interest rate derivatives to lock the cost of financing. Or an exporter might look to convert foreign currency revenue into domestic currency at a pre-agreed rate, eliminating earnings uncertainty. In the most cases, the primary aim is to mitigate risk, reduce balance-sheet volatility, and increase certainty in cash flows, allowing firms to invest in new business initiatives with greater confidence. Governments may decide to issue debt in foreign currency as a means to help development of overseas capital markets, to access a new investor base or to tap into cheaper funding rates, then use a cross-currency swap to eliminate interest rate and currency mismatches. By using derivatives, these entities can effectively and efficiently manage and optimize risk profile of their debt portfolios and manage their overall balance sheet. (ISDA Quarterly, 2017)

Basic derivative instruments that can decrease all growing price risks on financial markets are forwards, futures, options and swaps. Derivative instruments are derived from specific assets like commodity, securities, currencies, interest rates, equity, stock indexes, credits and mortgages and they represent standardized contracts with delay delivery and future payment of contracted material. According to Dugalić and Štimac (2007), on the spot market investors trade with securities and other assets with current delivery and payment in 2-5 days, but on the derivative markets investors want to manage market risk so they define contracts now with future terms of delivery and payment. Basic characteristics of derivative contracts are: standardization of basic asset and standardization of trading terms, assembly of supply and demand, mechanisms to guarantee settlement, delivery due date, means of payment etc. (Dugalić and Štimac, 2007).

Derivative instruments have departed from underlying asset and become individual trading instrument which maturity value indirectly depends from value of underlying asset. According to Zakić and Stojanović (2008), besides two original roles of derivative instruments - to acquire funds for agricultural production and increase investment profitability, derivatives have one more significant role – to protect capital value from market risks. Also, in the most cases there is no delivery of contracted asset on maturity but only cash settlement of price difference, so these instruments have a great possibility for earnings and speculation besides hedging. Investment banks, pension funds, investment funds and international companies have a very important role on derivative markets because they use derivatives in order to decrease capital costs, manage risks and implement arbitrage on world securities markets. Derivatives can also be interesting for government investing in areas that can only sustain with their help because derivatives decrease risks of starting market turbulences like inflation. Trading with derivatives have great advantages, but also some risks that regulation institutions have recognized as threats and brought new regulation limits and rules

for derivative trading, but regulation has to predict change and development of new instruments in order to decrease risks and prevent financial crises.

In the last 30 years use of derivatives notes constant growth rates in developed countries as well as in emerging countries, which is shown in trading volume data on organized derivative exchanges and Over-the-Counter OTC market by all derivative categories. (Sundaram, 2013). If we analyze structure of trading volume on the world greatest derivative exchanges we can see that financial derivatives have dominant role in relations to commodity derivatives because of different functions and characteristics of underlying asset. Financial derivatives are originally created for protection from price risk, interest rate risk and currency risk, however, in time financial derivatives become lucrative form of investment and speculation. Although, commodity derivatives with bases in agricultural products have dropped in terms of market share, they still satisfy their significant roles to transfer risk and predict prices on agricultural market. If we analyze commodity derivatives in absolute numbers, there is trend of growth that supports all rising popularity of hedging in agribusiness sector. (Zakić and Stojanović, 2008)

According to Saunders and Cornett (2006), the most financial institutions uses derivative contracts to manage financial risks at the micro or macro level with micro hedging or macro hedging. Micro hedging is strategy of implementation futures and forward contracts to manage risk of specific asset or liability (for example protect value of bond portfolio from increase of interest rates). Managers use macro hedging when derivative instruments are used to manage total duration gap balance and consider entire portfolio in order to mutually balance the interest rate sensitivity and duration of asset and liabilities. Managers of financial institutions consider choice between micro and macro hedging with regards to profit expectations, target level of protection, prediction of market indicators, accounting standards and regulations. Also, derivatives are not part of regulatory capital reservations that is defined for deposit institutions, so they have great advantages as an investment alternative. (Saunders and Cornett, 2006)

In 1980s the USA futures exchanges were dominant in derivative trading but strong futures growth rate and high profits as a result had entrance of foreign exchanges in derivative trading segment (London Metal Exchange, Tokyo Commodity Exchange, Central Japan Commodity Exchange, Shanghai Futures Exchange, National Stock Exchange of India, Moscow Exchange etc.). Domination of the American futures exchanges was replaced with broad geographical dispersion and fierce competitive struggle of the great futures exchanges. Also, the emerging countries are participating in this area of financial business besides to developed countries. The Globex electronic trading system contributed further expansion and globalization of derivative market and it provides traders around the world opportunity to trade with futures and options even when futures exchanges are not officially open. In these way derivative trading becomes international and competition between American and foreign futures exchanges are even more intense. (Eremić, 2004)

With futures and options investor's trade on organized exchanges while with forwards and swaps investor's trade on OTC market. If we have in mind that a great number of derivative transactions take place directly on the OTC market there is need of regulatory measures and obligation that derivative transactions goes through Central Clearing Counterparty – CCP so it is possible to monitor derivative trading volumes, their quality and structure of participants. (Rudić, 2016) Financial derivatives that are traded on OTC market are set on rules defined in the standardized financial contracts like ISDA Master Agreement that have role of minimizing credit risk through netting and collateral. Netting is process of credit risk reduction through mutual obligations offset to a net liability that one party pays to the other. Collateral, as means of security, is defined in ISDA document *Credit Support Annex – CSA*. These agreements that define netting and collateral on derivative trading through OTC are necessary to involve in our legal framework so market participants like banks and exporting companies could have more incentives to enter in derivative transactions. (Rudić, 2016)

Materials and methods

Authors uses data from statistical portal Statista, Annual report of World Federation of Exchanges from 2016, data from internet sites of Belgrade Stock Exchange, National Bank of Serbia and Agrar Product Novi Sad. As the research method authors use content analysis and comparison of significant national and foreign literature with analyses of trading volumes on international and domestic exchanges. Authors analyze trading volumes of top world derivative exchanges, structure of derivative trading by product lines and regions in 2016 and 2015 with analysis of current situation on the financial market in Serbia. The paper goal is to present all relevant assumptions and significance of derivative trading development in Serbia with discussion about choice to develop derivative trading on the already existing exchanges: Belgrade Stock Exchange and Agrar Product Novi Sad, or to start a new futures exchange that is going to be specialized for derivative trading. Also, paper analyses derivative trading with foreign currency forwards and swaps on the OTC market in Serbia.

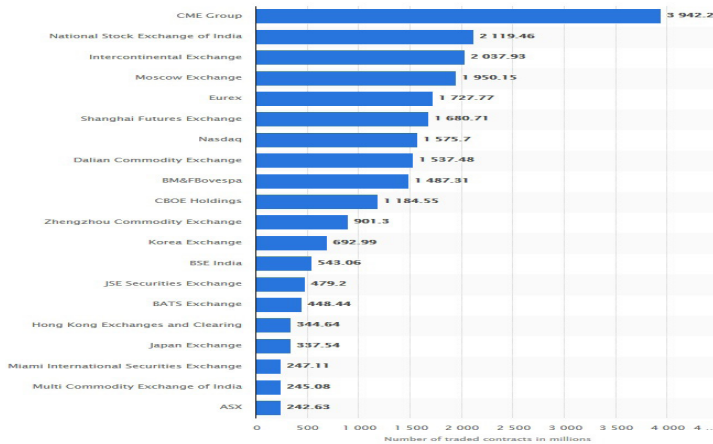
Results and Discussion

Analyses of global derivative market

According to statistical portal Statista authors present next review of the top world derivative exchanges by number of closed contracts in 2016 (*Figure 1*). CME Group that is consisted of Chicago Mercantile Exchange, Chicago Board of Trade, New York Mercantile Exchange and Commodity Exchange (NYMEX, COMEX), has achieved the greatest volume of derivative trading in 2016 with approximately 3,94 billion of closed contracts that had approximately average annual value of 1 quadrillion dollars. CME Globex electronic trading platform offers vast range of the most liquid financial derivative markets in USA, Europe, Asia and Latin America. Today, more than 80% of derivative trading in CME Group is going through Globex platform. In the top five exchanges with the largest volumes of derivative trading besides CME Group

are: National Stock Exchange of India with 2.12 billion of contracts, Intercontinental Exchange with 2.04 billion of contracts, Moscow Exchange with 1.95 billion of contracts and Eurex with 1.73 billion of contracts. The world derivative trading is also performing in significant amount through next exchanges: Shanghai Futures Exchange, NASDAQ, Dalian Commodity Exchange, BM&Fbovespa, CBOE Holdings, Zhengzhou Commodity Exchange, Korea Exchange, BSE India, JSE Securities Exchange, BATS Exchange, Hong Kong Exchange and Clearing, Japan Exchange, Miami International Securities Exchange, Multi Commodity Exchange of India and ASX.

Figure 1. The top world derivative exchanges in 2016 by trading volume in millions of contracts

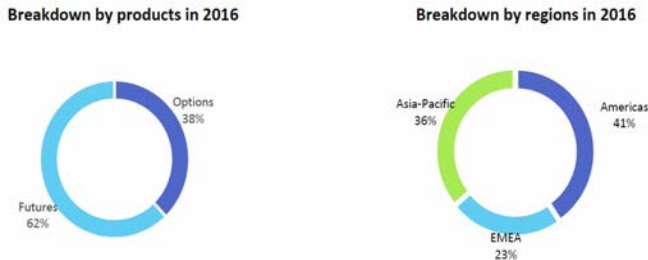


Source: Statista

According to report of World Federation of Exchanges - WFE (2017) there is rise in derivatives trading of 2.2% in 2016 in relations to 2015. Total number of closed derivative contracts is 24.9 billion: options participate with 9.4 billion of contracts and futures with 15.5 billion of contracts. If we compare this result with 2011 that is the strongest year in trading volumes, total trading volume has risen for 9.4% and average annual growth rate is 2.2% in the last five years. If we evaluate regional distribution of derivative trading volume, we can see that USA has increased trading volume for 6.7% and EMEA region (Europe, Middle East, and Africa) for 7.8% compared to 2015, while Asia-Pacific region has decreased trading volume for 5.5%. USA region has the greatest participation in derivative trading volume with 41% of total trading volume and growth in trading volume of stock index futures and options, interest rate futures and options, currency futures and options and commodity futures and options. EMEA region participates with 23% of total derivative trading volume and has growth rate of 7.8% compared to 2015 that is result of increased trading volumes in stock index futures, interest rate and commodity derivatives. Asia-Pacific region participates with 36% of total derivative trading volume and has fall of 5.5% because of decreased trading volume of derivatives on single stocks and stock indexes. On the next two

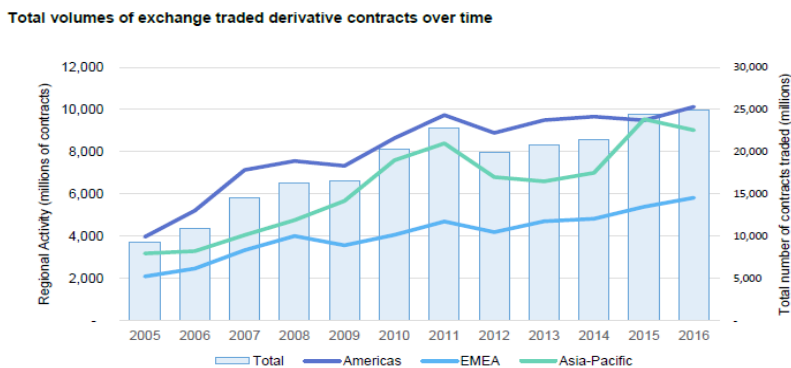
Figures (*Figure 2 and Figure 3*) we can see structure by products and regions in 2016 and review of regional derivative trading volume for the period from 2005 to 2016. (World Federation of Exchange, 2017)

Figure 2. Structure of derivative trading by products and regions in 2016



Source: World Federation of Exchange, 2017.

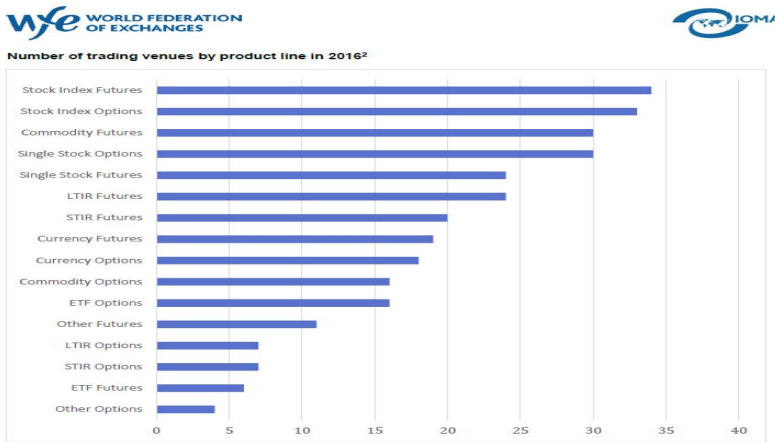
Figure 3. Total derivative trading volumes by regions from 2005 to 2016



Source: World Federation of Exchange, 2017.

When we analyze *Figure 4* and *Figure 5* from WFE report about derivative trading volumes by instruments we can see that all derivative instruments have growth rates only equity derivatives and other derivatives had decreased compared to 2015. Commodity derivatives have growth rate of 27.5% compared to 2015, with over 6.8 billion contracts in 2016. Interest rate derivatives and currency derivatives have growth rates of 5.5% and 10.4% respectively compared to 2015. In 2016 futures have participated with 62% and options with 38% in global derivative trading volume, while in 2015 options accounted for 42% of global derivative trade. Futures contracts have raised 10% and options dropped 8% compared to 2015. On the *Figure 4* authors present the most traded derivatives contracts by trading volume in 2016, where we can notice that investors traded the most with futures and options on stock indexes, commodity futures, single stock futures and options, short term and long term interest rate futures, currency futures and options etc.

Figure 4. Derivative trading volumes by product line in 2016



Source: World Federation of Exchanges, 2017.

Figure 5. Product composition in period 2005-2016 and regional trading volume in 2016



Source: World Federation of Exchanges, 2017.

According to WFE report (2017), equity derivatives remain the most actively traded derivative product, but their contribution has declined for the first time under 50% of the total volume traded, ending 2016 at 45%. Equity derivatives volumes fell by 11% in 2016 with declines across almost all product lines. Single stock options were down 4.9% related to 2015 while volumes traded in stock index options and futures were down 26.1% and 7.3% respectively. Despite the decline in volumes, these were still among the most actively traded derivatives products in 2016, accounting for over 75% of all equity derivatives traded and for 34% of all exchange traded derivatives. While the EMEA and the Asia-Pacific region (which together accounted for 47.5% of

the equity derivatives volumes traded) saw declines of 20.7% and 26.1% in volumes traded respectively, the USA region had a 5.5% increase in the volumes traded related to 2015. (WFE, 2017)

According to WFE report (2017), interest rate derivative volumes, which accounted for 14% of the total derivatives volume traded in 2016, were up 5.5% related to 2015, a reversal from the declines observed in 2014 and 2015. The America and the EMEA region, which together account for 94% of all exchange traded interest rate contracts, experienced increases in volumes traded of 5.5% and 6.5% related to 2015. Volumes in the Asia-Pacific region, which accounts for only 6% of the total volume, were up 0.4% related to 2015. Currency derivatives, (11% of the total derivatives volume traded) grew by 10.4% related to 2015. The USA and the Asia-Pacific regions, which together account for 61.6% of the total volume traded, saw increases in volume traded of 14% and 23.2% respectively. The EMEA region, (38.4% of the total volume traded) has a decline of 3.2% related to 2015.

According to WFE report (2017), commodity derivative trading volumes were up 27.5% related to 2015. Commodity futures overtook single stock options as the most actively traded contract type in 2015. This remained the case in 2016 with commodity futures accounting for 27% of the total volume traded. The EMEA region which is responsible for 16.1% of the total commodities volume traded experienced a huge jump of 57% in the volume traded. The Asia-Pacific region (which accounts for 63.9% of commodities volume) saw a 27% increase in the volume traded while the USA region (20% of the total volume) experienced a 13% increase in the volume traded related to 2015. The “other derivatives” category comprised from exotic options and futures, REIT derivatives, dividend and dividend index derivatives, CFDs and inflation futures, have dropped by 1.1% related to 2015, driven by the decline in volumes traded on Johannesburg Stock Exchange and Japan Exchange Group.

Development of derivative trading on the financial market in Serbia

Futures and other derivatives began their evolution in XIX century on the futures exchanges in USA and other developed countries, but Serbian financial market is still undeveloped in regard to exchange instruments, trading volumes and number of investors. Chicago Board Options Exchange CBOE successfully released the first futures contract on virtual crypto currency bitcoin in December 2017 that has exceeded all expectations about trader's interest and large demand overloaded exchange several times. (N1, 2017) When we analyze global financial market and innovations like bitcoin we can see the level that our national market is far behind in this competitive race.

On the Belgrade Stock Exchange investors mostly trade with stocks and national bonds, although trading materials can be a great number of market instruments like other liability securities, warrants for buying stocks, bonds or other securities, derivatives, deposit certificates and other financial instruments that are defined in the Law on securities market and other financial instruments for trading on national exchanges. Also, Agrar Product Novi Sad has only spot trading with core agricultural products like corn, wheat and soya. (Birovljev, Ercegovac and Radaković, 2012)

One of the options to start standardized derivative trading in Serbia is to establish a new futures exchange for trading with commodity and financial derivatives and adopt changes in existing Law on capital market. The other option is to expand listing on the current exchanges from just spot transactions to futures and options. This option involves expansion of Belgrade Stock Exchange and Agrar Product Novi Sad listing with financial and commodity derivative trading respectively, that is standardized in means of trading asset, terms of payment and delivery. This process involves initiating margin account system and establishment of clearing house. One of the important questions is defining clearing and settlement model that is process in current jurisdiction of the Central Registry and Depository of Securities, but common global praxis is principle „in the house“ - that clearing is organized in the exchange market. In addition, it is necessary to have government support with establishment of Futures Trading Commission on the USA model that would perform role of registration and granting working permits, securing fair business, regulate and supervise trade in derivative instruments. (Birovljev et. al, 2012)

What is current situation on the Belgrade Stock Exchange? Belgrade Stock Exchange indexes recorded maximal values on the last trading day in 2017, BELEX15 reached daily maximum of 763.39 index points, which is the highest value of this indicator reached in the last six years, precisely from 20.06.2011., while the closing value was 759.80 and that was the highest recorded value of this indicator on the end of a year since the last trading day in 2007. BELEXline finished 2017 with the level of 1.662,53 points, which is the best result from 15.10.2008.

Belgrade Stock Exchange joined EBRD project SEE Link on 22.02.2016., which represents innovational regional trading platform for securities listed on exchange markets in Bulgaria, Macedonia and Croatia. Submission of Belgrade Stock Exchange and Ljubljana Stock Exchange were signed at the headquarters of the EBRD in London on Investment Summit of the Western Balkans. With the last connection of the Banja Luka Stock Exchange, SEE Link trading platform was expanded on the six markets with total value of market capitalization over 50 milliards of dollars and over 900 available securities. In the next years it is expected that Athens and Sarajevo Stock Exchange also join this trading platform.

According to annual trading reports of the Belgrade Stock Exchange, value of total trade for 2016 was 44.57 milliards of dinars or almost 362 million of euro's, which is growth of 98.7% in relations to 2015. Trading instruments were stocks, municipal bonds and bonds of the Republic of Serbia. Unlike previous years when stocks were dominant in trading, 2016 will be marked as the first year of total domination of bonds of the Republic of Serbia in trading records. (Belgrade Stock Exchange, 2017)

Besides positive trends on the Belgrade Stock Exchange that encourages the idea of trading material expansion through standardized trading with futures and options, additional support of derivative development in Serbia is present through OTC market and organized auctions of the National Bank of Serbia. National Bank of Serbia enables protection from foreign exchange risk through organized meetings on the interbank market for foreign exchange hedging. On these meetings forward rate is set as fixed

price for buying or selling of the foreign currency on specific date in future. On this way instruments of foreign hedging are used equally for protection from strengthening or weakening of the currencies. For the example exporters had opportunity to sign on 29.01.2011. quarterly forward contract to buy dinars for euros in approximate exchange rate of 107.5 dinars. If exporters used that opportunity they could change their inflow of euros on the forward rate of 107.5 instead of exchange rate in that moment of 99.7 dinars.

Banks in Serbia offer possibility for closing foreign currency forward, covered foreign currency forward and foreign currency swap. Foreign currency forward represent contract for buying or selling foreign currency for dinars with delivery of both currencies on the specific date in the future at pre-agreed exchange rate. Covered foreign currency forward represent contract where companies have obligation to in advance deposit a part or total amount or dinars, but foreign currency is exchanged at contracted date in the future. From total of 29 banks that have license to operate in Serbia only 18 banks offers services of foreign currency hedging to exporting companies. (National Bank of Serbia, 2017)

Foreign currency swaps represent contracts for buying and selling two currencies at the same time with a priori determined exchange rate on two different future dates. National Bank of Serbia organizes swap auctions on dates predefined in the calendar of regular foreign currency swap auctions EUR/RSD, in order to boost interbank swap market development. Auctions are organized for selling foreign currency, euros for dinars, which provide additional euro-liquidity and for buying foreign currency, euros for dinars, which provide additional dinar-liquidity.

Swap points are difference between forward and spot exchange rate EUR/RSD in foreign currency swap and indicates gap in the interest rates that carries two currencies, euro and dinar, that are subject of swap contract. Swap points are calculated in compliancy with the Decision on conditions and manner of conducting swap buying and selling of foreign currency between the National Bank of Serbia and domestic banks. National Bank of Serbia organized so far nine swap auctions and swap conditions for ninth auction for selling foreign currency – euro's for dinars organized on 19.01.2018. were: spot exchange rate was 118,4991, duration of swap transaction was 14 days, date for spot transaction was 23.01.2018., date of swap maturity was 06.02.2018., the minimum bid for swap purchase and sale of foreign currency was 1.000.000€.

According to information from National Bank of Serbia internet site about foreign exchange transactions realized in 2017 authors present total interbank trading on foreign exchange market classified by execution date of transaction to: transactions with date of execution shorter than spot, spot, forward and swap (*Table 1*). Presented data about interbank trading on the foreign exchange market do not involve transactions with the National Bank of Serbia on interbank foreign exchange market. When we analyze presented data we can point out that forward trading has no realized transactions in the 2017, although it is available. Also, forward trading has no realized transactions in 2016 and 2015 according to the records of the NBS. Swap transactions in 2017 had trading volumes of 182.654.028 euro's and 201.651.573 dollars. In the future National Bank of Serbia should have more active participation in currency swaps for adequate management of foreign exchange reserves. In addition, currency swaps and other

derivative arrangements could be used for public debt hedging to minimize exposure to the global financial market turbulences.

Table 1. Total interbank trade on the foreign exchange market of Serbia in 2017

Dates 2017	Trading volume - execution date shorter than spot		Trading volume - spot		Trading volume - forward		Trading volume - swap	
	EUR	USD	EUR	USD	EUR	USD	EUR	USD
1.2.2017.	7.066.103	7.621.497	23.000.000	24.807.796	0	0	10.000.000	10.785.998
8.2.2017.	2.774.407	2.962.789	9.500.000	10.145.047	0	0	10.000.000	10.678.997
14.2.2017.	5.227.597	5.551.187	0.00	0.00	0	0	10.000.000	10.619.003
22.2.2017.	2.044.814	2.156.665	10.000.000	10.547.002	0	0	10.000.000	10.547.002
Total Feb.	92.228.246	98.268.166	179.339.304	191.553.069	0	0	40.000.000	42.631.000
1.3.2017.	15.254.720	16.107.452	13.000.000	13.726.695	0	0	10.000.000	10.558.996
8.3.2017.	378.64	400.00	9.000.000	9.507.604	0	0	10.000.000	10.564.004
15.3.2017.	1.768.271	1.878.434	5.000.000	5.311.500	0	0	10.000.000	10.622.999
22.3.2017.	5.435.024	5.871.998	7.500.000	8.102.997	0	0	10.000.000	10.803.996
23.3.2017.	3.381.568	3.649.728	24.500.000	26.442.861	0	0	2.779.578	3.000.000
29.3.2017.	1.544.214	1.669.450	14.500.000	15.675.951	0	0	10.000.000	10.811.001
Total March	105.436.180	112.693.164	270.800.000	289.390.380	0	0	52.779.578	56.360.996
5.4.2017.	4.363.193	4.657.272	23.500.000	25.083.900	0	0	10.000.000	10.674.000
12.4.2017.	2.751.733	2.918.763	11.160.272	11.837.699	0	0	10.000.000	10.606.999
25.4.2017.	1.700.000	1.847.731	16.092.005	17.490.407	0	0	2.000.000	2.173.801
Total April	123.957.178	132.628.351	311.595.715	334.509.855	0	0	22.000.000	23.454.800
5.5.2017.	5.414.133	5.947.427	9.300.000	10.216.054	0	0	3.000.000	3.295.501
Total May	87.158.529	96.648.311	276.049.788	305.585.611	0	0	3.000.000	3.295.501
30.6.2017.	7.000.000	8.007.302	21.985.824	25.149.590	0	0	2.000.000	2.287.800
Total June	101.519.022	114.218.105	409.903.628	461.234.239	0	0	2.000.000	2.287.800
3.7.2017.	2.087.619	2.382.599	31.000.000	35.380.286	0	0	3.734.440	4.262.115
5.7.2017.	2.590.432	2.941.694	17.650.000	20.043.336	0	0	2.000.000	2.271.200
7.7.2017.	87.61	100.00	25.750.000	29.391.051	0	0	4.000.000	4.565.600
11.7.2017.	5.000.000	5.694.501	21.351.216	24.316.905	0	0	4.571.904	5.206.943
18.7.2017.	3.350.000	3.862.550	32.100.000	37.011.301	0	0	4.568.106	5.267.026
Total July	163.605.160	189.659.389	486.824.197	560.640.609	0	0	18.874.450	21.572.884
4.9.2017.	6.292.544	7.478.057	45.500.000	54.072.179	0	0	5.000.000	5.941.998
18.9.2017.	1.233.738	1.473.329	12.225.607	14.599.813	0	0	2.000.000	2.388.399
21.9.2017.	1.250.000	1.485.875	6.752.377	8.026.550	0	0	1.000.000	1.188.700
Total Sept.	216.703.007	258.291.733	510.863.777	608.749.760	0	0	8.000.000	9.519.097
20.11.2017.	2.150.000	2.522.809	37.755.667	44.302.491	0	0	9.000.000	10.560.598
23.11.2017.	7.832.726	9.264.545	80.022.726	94.650.846	0	0	9.000.000	10.645.196
29.11.2017.	6.153.100	7.293.269	13.000.000	15.408.899	0	0	9.000.000	10.667.699
Total Nov.	93.522.419	109.984.214	845.219.991	993.295.954	0	0	27.000.000	31.873.493
6.12.2017.	9.572.972	11.334.401	17.380.000	20.577.923	0	0	9.000.000	10.656.002
Total Dec.	590.755.730	700.225.607	852.727.484	1.010.495.270	0	0	9.000.000	10.656.002
Total Volume	1.574.885.471	1.812.617.040	4.143.323.884	4.755.454.847	0	0	182.654.028	201.651.573

Source: National Bank of Serbia, summary review of the authors

In order to have more active involvement of banks, investment funds, pension funds and companies on derivative market and to benefit from derivative instruments, it is necessary to have government boost and to organize seminars and professional trainings in this area. Also, the significant help would be strengthening of international collaboration with international institutions and associations like the World Bank and ISDA and greater involvement of business associations like the Association of Serbian banks, ACI Serbia and Chamber of Commerce and Industry of Serbia. Serbian government should also regulate question of netting and collateral that would enable safe, transparent and favorable derivative transactions on OTC market. (Rudić, 2016)

Development of commodity derivatives in Serbia

According to Mihailović, Cvijanović and Kuzman (2014), primary agricultural production is a significant factor of the total national economy, primarily due to its share in GDP and total employment. Together with food industry, this sector has over 15% of Serbian GDP and primary agriculture significantly contribute to other industrial sectors which directly depend on raw materials from agriculture. On the Serbian market perhaps the best way to start standardized derivative trading is to firstly introduce commodity futures and options on Product Agrar Novi Sad in order to maximally use current facilities of exchange and conduct hedging with agricultural products like corn, wheat and soya (the most traded commodities from 2007 to 2018) and agricultural index PRODEX.

Also, it is necessary to promote trading with warehouse receipts that are already allowed with annex of rules for trading on exchange and are listed on national commodity exchange. The one step forward to implementation of commodity derivative trading is adoption of the Law on commodity exchanges that has all rules for modern commodity trading and allows futures trading besides to spot trading as in all developed countries. Results of the new futures trading would certainly be low at first time when we consider the low development of our market and small number of active trading participants. Also, introduction of futures trading on existing national exchanges brings risk that our existing undeveloped exchange market would crash because margin account system requires deposit payments for guarantee trading model that would in terms of extreme illiquidity of our market had effect on significant decrease of participants and trading volume. (Product Agrar Novi Sad, 2018)

According to Zakić and Stojanović (2008), the significant role in the futures trading development is finding solutions for financing agricultural production and stocks and providing free financial funds available for investment in derivatives. In global practice, as resolution for this problem, the warehouse receipt is often used, which is a link between financing and commodity trading. Warehouse receipt is security that proves ownership of commodities that is placed in licensed public warehouse that can conserve quality of grains, vegetables, fruits and meat. Warehouse receipt has two parts: 1) coupon is proof of ownership of stored goods; 2) mortgage is basis for obtaining banking loans for short-term financing of farmers. Warehouse receipts have great

advantages for short term financing agricultural production and quality classification of stocks for spot and futures exchange trading.

Commodity derivative trading development and warehouse financing model requires achievement in particular conditions, especially in the field of regulation, reliable and well-managed public warehouses, precisely defined licensing process, inspection and monitoring of warehouses, establishment of guarantee fund and clearing, the necessary knowledge of market investors, the introduction of derivative instruments to futures exchange listing, establishing Futures Trading Commission and the key condition for development of commodity derivatives is that national banks target the financing of agricultural production and supplies. (Zakić and Stojanović, 2008)

Zakić et al. (2014) also recommends development of an electronic warehouse system that has the next significant advantages related to paper form public warehouse system:

- Electronic system is safer because public warehouse will be allowed to issue warehouse receipts up to the licensed capacity, while in paper form public warehouse can issue warehouse receipts in quantity greater than the licensed capacity. In this manner, the electronic system would increase the overall safety and the lower amount of funds in the Indemnity Fund would be necessary.
- Banks will be allowed to enter in the electronic warehouse system and put the collateral on warehouse receipt. In this way procedures for banks are less time consuming and more secure which leads to lower interest rates.
- Commodity exchanges will have direct links and trading orders could be sent in electronic form, while paper warehouse receipts needs to be sent to the commodity exchange by mail.
- There is no need for public warehouse to purchase costly blank paper warehouses receipts and dairies for keeping public warehouse receipts records, so the overall system would be less expensive.

There are a lot of questions that should be thoroughly examined and choice needs to be a solution that is the best way to implement derivative trading in practice. Existing practice of trading with commodities is dated from 1921 and Product Agrar Novi Sad is functioning successfully since 1958. (Product Agrar Novi Sad, 2018) With adoption of the Law on commodity exchanges, Product Agrar Novi Sad would have possibility for expansion market material listing towards standardized contracts like futures and options. On this way exchange market would be deeper, more attractive and have efficient mechanism for market participants protection and this opens possibility for longterm and safer production planning. Also, in the next phase financial derivatives could be introduced on Belgrade Stock Exchange listing in order to exploit all benefits of derivative trading and existing infrastructure. (Birovljev et. al, 2012) Serbia has the opportunity to establish futures and options exchange market and become leader in commodity and financial derivative trading in the South East Europe.

Conclusions

Futures and other derivatives began their evolution in XIX century on the futures exchanges in USA and other developed countries, but the Serbian financial market is still undeveloped in regard to exchange instruments, trading volumes and number of investors. When we analyze global financial market and innovations like bitcoin we can see the level that our national market is far behind in this competitive race. On the Belgrade Stock Exchange investors mostly trade with stocks and national bonds, while the Agrar Product Novi Sad has only spot trading with core agricultural products like corn, wheat and soya. On the Serbian market perhaps the best way to start standardized derivative trading is to firstly introduce commodity futures and options on the Agrar Product Novi Sad in order to maximally use current facilities of exchange and conduct hedging with agricultural products and agricultural index PRODEX. Derivative trading development and warehouse financing model requires achievement of very important conditions, especially in the field of regulation, reliable and well-managed public warehouses, precisely defined licensing process, inspection and monitoring of warehouses, establishment of margin account system, guarantee fund and clearing, the necessary knowledge of market investors, establishment of Futures Trading Commission, the introduction of derivative instruments on futures exchange listing and the key condition for commodity derivatives development is that national banks target the financing of agricultural production and supplies.

There are a lot of questions that should be thoroughly examined and choice needs to be a solution that is the best way to implement derivative trading in practice. With adoption of the Law on commodity exchanges, the Agrar Product Novi Sad would have possibility for market material listing expansion towards standardized contracts like futures and options. On this way exchange market would be deeper, more attractive, have the efficient mechanism for market participant's protection and this opens possibility for safer and long-term production planning. In addition, financial derivatives could be introduced on the Belgrade Stock Exchange listing in order to exploit all benefits of derivative trading and existing infrastructure. Serbia has the opportunity to establish futures and options exchange market and become leader in commodity and financial derivative trading in the South East Europe.

Parallel with development of standardized derivative trading it is necessary to boost Serbian OTC market with more government measures that promote foreign currency forward and swap contracts closed on organized meetings and auctions of the National Bank of Serbia on the interbank market and to organize and promote interbank market for other types of forward and swap contracts that would offer complete protection from financial risks. Situation with foreign currency forward trading through OTC market is alarming, the 2/3 of banks that have license to operate in Serbia offers services of foreign currency hedging to exporting companies, but according to National Bank of Serbia data there was no forward trading in the past period, although it is available. In addition, Serbian government should regulate the question of netting and collateral that

would enable safe, transparent and favorable derivative transactions on OTC market. In order to have more active involvement of banks, investment funds, pension funds and companies on derivative market and to benefit from derivative instruments, it is necessary to have government support and to organize seminars and professional trainings in this area.

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Conflict of interests

The authors declare no conflict of interest.

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THE IMPACT OF EMPLOYEE SATISFACTION ON THE TOURIST SATISFACTION WITH THE SERVICES OF SPA TOURISM

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ABSTRACT

The quality of employees' work in the tourism industry depends primarily on their job satisfaction. This has directed the subject of the research in this paper to examine the impact of employee satisfaction on tourist satisfaction with the services of spa tourism in the Republic of Serbia. Research was conducted using the survey method, the questionnaire technique, in Lukovska Spa, based on a sample of 125 respondents, of which 55 were employees and 70 tourists / guests in hotels "Jelak" and "Kopaonik". The most important finding of the research is related to the correlation between the employee satisfaction and the tourist satisfaction with the quality of service in Lukovska Spa, which confirmed the hypothesis of the direct and positive impact of employee satisfaction on the tourist satisfaction with the quality of services. Employee satisfaction has a positive impact on the quality of the service, which directly affects the tourist satisfaction with the quality of the services provided.

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Introduction

The aim of every business organisation is to be successful and to achieve long-term progress. The modern market and the business environment are characterized by turbulence and unpredictable changes which cause organizations to be flexible, adaptable and innovative in order to maintain its competitiveness and to survive on the market. In order to succeed, a strong and positive relationship between employees and the organization is necessary. Employees are of great importance and they have a

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crucial role in the process of production; they introduce changes and innovations, they create additional value and they increase business efficiency, and thus the initiation of future organization performance. When employees are satisfied, they are motivated to fulfill their business tasks and to achieve the goals of the organization, which forms the basis for the progress and success of the organization. This is particularly evident in the service sector, such as tourism, in which consumer loyalty, their decisions about purchases and repetition of purchases, and their future recommendations depend on their perception and satisfaction, which employees influence directly or indirectly.

In the spa tourism organizations, tourists and employees are referred to mutual cooperation during the realization of the service, and the success of this interaction depends largely on the capacities, knowledge and skills of employees in the provision of services (Perić et al., 2015). The quality of employee performance in the tourism industry depends primarily on their job satisfaction. Employees who are not sufficiently professional and dissatisfied can have a long-term negative impact on the quality of services and products and, therefore, on the satisfaction of consumers in tourism (Vrtiprah, Sladoljev, 2012). The assumption about the impact of employee satisfaction on consumer satisfaction in the service sector was confirmed by the results of numerous empirical researches (Harter et al., 2002; Koys, 2003; Wangenheim et al., 2007; Yee, Yeung, Cheng, 2008; Jung, Yoon, 2013) which indicate the significant impact of employee satisfaction on creating and maintaining customer satisfaction and loyalty, resulting in an increase in sale and profitability of the organization. Even though there are studies in domestic, expert and scientific literature that examined various factors of tourist satisfaction and employee satisfaction in the tourism sector (Laškarin Ažić, 2017; González, Comesaña, Brea, 2007; Sekulić, 2016; Choi, Chu, 2000), there is a significantly lower number of studies which investigated the impacts and effects of employee satisfaction on customer satisfaction (Jeon, Choi, 2012; Spinelli, Canavos, 2000). This has directed the subject of the research in this paper to examine the impact of employee satisfaction on the tourist satisfaction with the services of spa tourism in the Republic of Serbia. In order to achieve and maintain competitiveness, organizations in the tourism industry use different strategies, which is why it is important to examine whether and to what extent employee satisfaction affects customer satisfaction with the quality of services provided, in order to formulate an effective strategy and allocate significant resources to increase employee satisfaction.

The main goal of this research is to identify the impact of employee satisfaction on the tourist satisfaction with services in spa tourism. From the aspect of this research, an explanation of the relationship between employee satisfaction and satisfaction of service users in organizations of spa tourism is of primary importance, which is why the overall goal is realized through the following specific goals:

- to review the literature and studies in the area of employee satisfaction and tourist satisfaction;

- to analyze the impact of different organizational factors (relationships between management and employees, salaries and rewards, interpersonal relationships, education and training courses, working environment) on employee satisfaction in spa organizations,
- to identify the main factors of employee satisfaction;
- to identify the main factors of customer satisfaction with the quality of services;
- to analyze the impact of employee satisfaction on the quality of services in spa organizations;
- to analyze the impact of the quality of services on tourist satisfaction in spa tourism;
- to examine whether there are differences in employee satisfaction with regard to socio-demographic variables (gender, level of education, working internship);
- to examine whether there are differences in tourist satisfaction with the quality of services, in relation to socio-demographic variables (gender, level of education, age).

Spa tourism is an important segment of tourism of specific interests, in which the desire to improve wellbeing and beauty, as well as to prevent diseases in the spa tourist resort are the primary motives for travel (UNWTO, 2012:16). This type of tourism in Serbia has a long and rich tradition, and due to the large contribution of spa tourism in the tourism traffic in our country, Serbia is also known as the “country of spas” (Perić et al., 2017). In the past decade, wellness and health tourism and recreational tourism within the tourism industry have become one of the fastest growing segments and a very profitable market niche. Considering the fact that Serbia has a great but underused potential for the development of spa tourism, and the fact that the degree of evaluation of spa tourism value lags behind the real possibilities (Topalović, 2013), it is important to find an adequate strategy that will effectively increase the number of tourists in spa tourism, regardless of whether it is a large number of visitors or longer stays of tourists in a spa destination. Identification of factors that affect tourist satisfaction with the quality of services in spa organizations and the impact of employee satisfaction on the quality of spa services enables the management of spa tourism organizations to obtain a better insight into the relationship between employee satisfaction and the tourist satisfaction with the quality of the provided services and to use this information to customize their strategy so that it meets the wants and needs of their segment of the tourism market.

Literature review

Theories, approaches and concepts on the behavior and employee motivation and employee satisfaction were created as a response to the managerial challenge to find a way to manage the behavior of people in organizations, with the aim of achieving the goals of the organization (Miljković, 2007). Leadership strategies were built on this challenge. The task of the manager is, depending on the specific circumstances, to choose

and apply appropriate strategies that will ensure the desirable behavior of employees and the achievement of both personal goals of the employees and the goals and tasks of the organization. According to one of the first definitions of this term, employee satisfaction is seen as a combination of psychological factors and environmental factors that affect employee satisfaction with his or her performance (Pavlović, Marković 2014). Locke (1976:1297) defines employee satisfaction as a pleasant or positive emotional state which is the result of performing a job or a whole work experience. Davis and Nestrom (1985:109) see employee satisfaction as a relatively simple concept, which is a combination of positive and negative feelings that an employee has about his job. According to these authors, job satisfaction is closely linked to the behavior of an employee in the workplace, and how much his expectations match the real rewards that he receives through his work. This view is also supported by Statt (2004:78), who states that the employee satisfaction is manifested through the extent to which the employee is satisfied with the rewards he receives for performing his job. Lease (1998) points out that employees with higher levels of satisfaction have lower levels of being absent from work, they are more productive, more dedicated to the organization and its goals, and generally more satisfied with their lives. Sagger, Rafat and Agarwal (2012) emphasize that organizational factors impact the levels of employee satisfaction. Employees spend a lot of time at work and, therefore, it is logical that most factors from the organizational environment will influence employee satisfaction. Employee satisfaction can be improved through management of organizational factors, such as: organization development, the rewards system, promotion and career development, work environment, relationships with management, teamwork, general work satisfaction etc. (Đokić, Pepur, Arnerić, 2015:55). The results of research carried out by Meyer (1999) confirm that the level of employee satisfaction is related to employees' commitment, which means that employee satisfaction has a direct impact on organizational goals and performance. This is especially evident in the service sector, such as tourism and hotel industry, where the focus of quality is on services provided by employees and largely depends on their knowledge, skills, appearance and behavior towards tourists. Due to the intangibility of services in tourism, consumers can use a very small number of options for evaluating their overall experience, where employees' courtesy, service and professionalism are the most important tangible indicators of service quality. Therefore, the quality of contact between employees and tourists is one of the basic factors that determine the level of tourist satisfaction with the quality of the services provided.

The tourist satisfaction can be viewed as an evaluation of the user's experience with the provided services, whereby it is necessary that the tourist satisfaction with the service is rated at least as good as expected (Hunt, 1977). As Oliver (1980) further explains, when an individual experiences the service and compares the experience with the expectations, customer satisfaction or dissatisfaction arise as results. Therefore, tourist satisfaction is based on real experiences and their perception of the quality of the provided service. The quality of services consists of two dimensions: technical and functional quality, whereby technical quality refers to what the consumer actually receives from the service provided,

whereas the functional quality refers to the ways in which the consumer receives the service (Dinić, Vranješ, Gašević, 2014). Grönroos (1984) claims that the technical aspect of service quality should not be neglected, but he also emphasizes that the functional quality is the most important factor in the evaluation of service quality. In this sense, the contact of tourists with the employees in the tourism industry imposes itself as a crucial determinant of the functional quality of the service.

From the perspective of the previously mentioned research findings on the impact of employee satisfaction on their work performance and commitment to the job, it can be concluded that there is a direct impact of employee satisfaction on tourist satisfaction with the quality of service. The findings of numerous studies point to the accuracy of the assumption that the correlation between employee satisfaction and consumer satisfaction in the service sector is present. One of the earliest studies, carried out by Schneider and Bowen (1985), showed that satisfied employees express greater initiative, which further positively reflects on increasing consumer satisfaction with the quality of service. The findings of the longitudinal study which was carried out by Bernhart, Dontu and Kenneth (2000), in order to examine the relationship between employee satisfaction, consumer satisfaction and the profitability of fast food restaurants chain, have shown that there is a positive and significant relation between consumer satisfaction and employee satisfaction, until a significant relationship between consumer satisfaction and restaurant performance, as well as the impact of employee satisfaction on the work performance, has been revealed. Spinelli and Canvos (2000) conducted a research in six hotels in which 600 guests and 240 employees participated and they determined a statistical relation of employee satisfaction and guest satisfaction. A meta-analysis of 7,937 business units in 36 companies, the aim of which was to examine the impact of employee satisfaction on customer satisfaction, profitability, productivity and employee fluctuation, has shown that employee satisfaction has a significant impact on all mentioned variables (Harter, Schmidt, Hayes, 2002). Chi and Gursoy (2009) conducted a survey in order to examine the relationships between employee satisfaction and tourist satisfaction in 150 three and four star hotels, and the findings of the research are in accordance with the results of the previously mentioned studies. It has been confirmed that a direct relation between the employee satisfaction and the satisfaction of the tourists/hotel guests was established. Findings of this kind of empirical studies show that satisfied employees are highly motivated to provide quality service to consumers, and suggest that employee satisfaction should be of primary importance to the management of tourist organizations, because if the organization takes care of employees, employees will then adequately take care of tourists.

Methodology

The survey method, the questionnaire technique, was conducted for the collection of primary data. This technique includes the research method through which data is collected systematically from a group of respondents in the form of personal opinions. The main hypothesis of this research is that employee satisfaction positively influences

tourist satisfaction with the services in spa tourism. Accordingly, two additional hypotheses arise:

- H1: Employee satisfaction has a positive impact on the quality of services in organizations of spa tourism
- H2: The quality of the service has a positive impact on the tourist satisfaction in spa tourism.

The questionnaire as a research technique was chosen for the collection of primary data based on numerous studies which dealt with research on the impact of employee satisfaction on tourist or consumer satisfaction in the service sector (Chi, Gursoy, 2009; Harter, Schmidt, Hayes, 2002; Yee, Yeung, Cheng, 2008; Jung, Yoon, 2013; Spinelli, Canvos, 2000). Two questionnaires were designed. The first questionnaire was designed to examine the employee satisfaction, while the second questionnaire was designed to examine the tourist satisfaction with the quality of services in spa tourism. Both questionnaires consist of questions about the socio-demographic characteristics of the respondents in the first part, while the second part of the questionnaire contains statements related to various factors of satisfaction of employees/tourists, followed by variants of respondents' responses based on a five-point Likert scale (from 1= strongly disagree to 5=completely agree). The factors of employee satisfaction (management and employee relations, wage and rewards, interpersonal relations, training courses, work environment) were selected based on a review of literature on different models and key employee satisfaction factors (Lawler, Porter, 1967; Christen et al., 2006; Singh, Jain, 2013; Đokić, Pepur, Amerić, 2015). Taking into account the specifics of tourism and hotel industry business, factors of tourist satisfaction with the quality of service which are defined are (Spinelli, Canavos, 2000): the quality of check-in at the reception desk; tidiness and cleanliness of the room; quality and choice of food in the hotel restaurant; quality of wellness / spa and medical treatments, tidiness and cleanliness of the hotel; professionalism and hospitality of the hotel employees; overall quality of services in the hotel.

The survey was carried out during January, 2018 in Lukovska spa, in hotels "Kopaonik" and "Jelak", on a sample of 125 respondents (55 employees in hotels and 70 tourists). The questionnaires were filled out by employees during their working hours and they were given guidelines how to fill in the questionnaires. The questionnaire was filled in by 55 employees, that is 61%, from a total of 90 employees in both hotels. Questionnaires were handed out to guests in the hotel lobby, after lunch, that is, dinner. The questionnaire was filled in by 70 guests, which is 60% of the total number of guests staying at hotels "Kopaonik" and "Jelak" during the period. The data was processed by quantitative analysis. In the statistical data processing, optimal statistical methods for testing hypotheses were applied:

- Descriptive statistical measures were used for sample description,
- Variability measures - the mean (M) and standard deviation (SD) were used to display the scores on the questionnaires.

- Pearson's linear correlation coefficient was used to test the correlation between variables.
- Analysis of ANOVA variance and significance (F) was used to show the significance of differences between the scores on individual variables.

Statistical analyses were carried out within the statistical package SPSS 20.0.

Research results and discussions

Statistical processing of the data comprises a sample of 125 respondents, which is divided into two subgroups, one of which are hotel employees (N = 55) and a second sub-sample are hotel tourists / guests (N = 70).

Table 1. Sample structure

Category of respondents	Demographic variables	Category of variables	F	%
Employees	Gender	Male	23	41.8
		Female	32	58.2
	Work experience	Up to 5 years	10	18.2
		6 - 10 years	14	25.5
		10 - 20 years	16	29.1
		Over 20 years	15	27.3
	Education	Secondary	33	60.0
		College	11	20.0
		University degree	9	16.4
		Master/PhD	2	3.6
Tourists	Gender	Male	39	55.7
		Female	31	43.3
	Age	Up to 29 years	8	11.4
		30- 39 years	18	25.7
		40-49 years	5	7.1
		50-59 years	23	32.9
		Over 20 years	16	22.9
	Education	Secondary	18	25.7
		College	20	28.6
		University degree	24	34.3
Master/PhD		8	11.4	

Source: Author's calculation based on SPSS 20.0

In analyzing the research results, we will start from the specific research goals. First, we will comment on the impact of different organizational factors on the employee satisfaction in spa organizations, as illustrated in Table 2.

Table 2. Key factors of employee satisfaction

Claims about factor of employee satisfaction	N	Min	Max	Mean	Standard deviation
Management has a good communication with employees	55	2.00	5.00	4.3636	.77850
Management includes employees in the decision-making process	55	1.00	5.00	4.1273	.84007
Provided training courses	55	1.00	5.00	4.4000	.85201
Salary satisfaction	55	2.00	5.00	4.2727	.80403
Satisfaction with the working environment	55	3.00	5.00	4.4727	.53936
Reward system	55	2.00	5.00	4.2000	.84765
Good relationships among employees	55	2.00	5.00	4.4364	.68755
Overall job satisfaction	55	3.00	5.00	4.6545	.51705

Source: Author's calculation based of SPSS 20.0

The first important result is related to the fact that the overall job satisfaction has the highest score (4.65). It is interesting that overall job satisfaction is greater than any individual factor, indicating that there is either another important factor affecting job satisfaction, or it is that when a favorable general impression is disassembled to individual elements, better insight is obtained and a more realistic assessment of different aspects of the job. It can also be noted that the employees are satisfied with all aspects of the job because the scores on all factors have a value over 4. Factors employees are the most satisfied with are: satisfaction with the working environment (4.47), good relationships among employees (4.436), and job training course (4.40). In one of the previous studies in which employees of the hotels "Kopanik" and "Jelak" participated, the relations between employees and the provided training were evaluated worse, that is, they were ranked with the following scores: 3.89 and 4.00, whereas the satisfaction levels with the working environment were identical with the obtained results in this research (Perić, 2014). Greater employee satisfaction in the aforementioned is the result of the hotel management efforts to improve factors which influence employee satisfaction.

The following table of variance analysis shows statistically significant differences in terms of demographic variables of gender and years of working experience. There are no statistically significant differences in relation to the education level because the respondents have the same point of view for the given questions.

Table 3. Display of statistically significant differences in individual satisfaction factors in relation to demographic variables

Factor	Gender	Mean	Standard deviation	F	Statistical significance
Management includes employees in the decision-making process	M	4.39	0.66	4.131	.047
	F	3.94	0.91		
Factor	Work experience	Mean	Standard deviation	F	Statistical significance
Salary satisfaction	Up to 5	3.60	1.07	3.395	0.025
	6-10	4.36	0.50		
	10-20	4.37	0.81		
	Over 20	4.53	0.64		

Source: Author's calculation based of SPSS 20.0

When it comes to significant differences in demographic variables, it can be concluded that there is a difference between men and women in relation to management, because the results of the study suggest that management includes more men in the decision making process. The analysis showed that women are statistically significantly less involved in decision making by the management. This is an important data, given the fact that women take a great part of the tourism employees. Although this issue does not belong to the focus of the conducted research, it is important to point out the necessity of gender equality for women and men employed in tourism, and to draw attention to the need for further and deeper research into the hierarchical structure of tourism employees in terms of gender and participation of women in decision making. Another important difference is salary satisfaction, where the younger population of employees is significantly dissatisfied with the salary (3.60) from other age categories of employees, especially from employees with the longest working experience (4.53). The population of employees with the least length of service or working experience is the least satisfied with the salary in comparison to other categories. Considering that, in comparison to other satisfaction factors, there are no statistically significant differences between the category of employees with the shortest working experience, it can be assumed that this factor does not play a decisive role in relation to the overall employee satisfaction.

When it comes to factors of tourist satisfaction with the quality of services in spa tourism, the most important ones were, above all, the service, professionalism and hospitality of employees (4.857), and then check-in at the desk reception (4.77) (see Table 4). This leads to the conclusion that the guests' first impression of the hotel is very important, but it is not less important to maintain positive emotions acquired during the first contact of the tourist with staff.

Table 4. Factors of tourist satisfaction with the quality of services

Claims about factor of tourist satisfaction with quality of service in spa tourism	N	Min	Max	Mean	Standard deviation
Check-in experience	70	4.00	5.00	4.7714	.42294
Tidiness and cleanliness of the room	70	4.00	5.00	4.6143	.49028
Hotel restaurant	70	4.00	5.00	4.6143	.49028
Choice and quality of food	70	4.00	5.00	4.5857	.49615
Wellness and spa treatments	70	3.00	5.00	4.6429	.53934
Tidiness and cleanliness of the hotel	70	3.00	5.00	4.6143	.51900
Professionalism and hospitality of the hotel employees	70	4.00	5.00	4.8571	.35245
Overall satisfaction with the quality of services	70	4.00	5.00	4.7429	.44021

Source: Author's calculation based of SPSS 20.0

Findings suggest the importance of selected factors of tourist satisfaction with quality of services in spa tourism. However, in Table 4., it can be seen that satisfaction with the choice and quality of food (4.58) is the lowest rated, that is tourists were least satisfied with the quality and choice of food in the hotels they stayed in, but it is important to note that this did not affect the overall satisfaction with the quality of the services provided (4.74). The obtained results are in accordance with the results obtained by Spinelli and Canavos (2000) who conducted their research in six hotels. There are no significant differences in the population of tourists by demographic variables in terms of satisfaction with the quality of services.

In further analysis of the key factors of tourist satisfaction with the quality of services, the table below shows the correlation between overall satisfaction with the quality of services and individual factors of service quality.

Table 5. Correlation of factors of tourist satisfaction with the quality of services with overall satisfaction with the quality of services

Factors of tourist satisfaction with the quality of services	Overall satisfaction with the quality of services	
	Pearson correlation coefficient	Statistical significance
Check-in experience	0.458	0.000
Tidiness and cleanliness of the room	0.454	0.000
Hotel restaurant	0.675	0.000
Choice and quality of food	0.501	0.000
Wellness and spa treatments	0.523	0.000
Tidiness and cleanliness of the hotel	0.448	0.000
Professionalism and hospitality of the hotel employees	0.600	0.000
Overall satisfaction with the quality of services	1	

Source: Author's calculation based of SPSS 20.0

Based on these results it can be concluded that direct relationship, that is, professional and friendly communication is what tourists evaluated as the most positive and the most important factor, considering that staff courtesy, professionalism and hospitality are highly correlated with overall satisfaction with quality of services ($r=.600$). Furthermore, there is a very high positive correlation with the hotel restaurant ($r=.675$). It is interesting that this is the highest value of correlation obtained. A possible explanation should be sought in the fact that the hotel restaurant is part of the hotel which all guests can use on a daily basis, which is a very important part of the overall impression of tourists about the hotel and the quality of services which are provided. In accordance with this is the result about the service which was estimated at minimum of quality and that is quality and variety of food. In this sense, it can be recommended to the management of the hotel in spa tourism to improve the appearance, cleanliness and ambience of the hotel restaurant, as well as the quality and choice of food on the menu of the hotel restaurant, as one of the efficient ways of attracting tourists and improving the quality of service.

It is also important to identify the correlation and the impact of employee satisfaction on the quality of services and the satisfaction of the tourists with quality services in spa organizations.

Table 6. Correlation of factors of employee satisfaction with the overall tourist satisfaction with the quality of services

Factors of the employees satisfaction	Overall satisfaction with the quality of services	
	Pearson correlation coefficient	Statistical significance
Overall job satisfaction	0.492	0.000
Reward system	0.300	0.026
Salary satisfaction	0.396	0.003
Satisfaction with the working environment	0.483	0.000
Overall satisfaction with the quality of services	1	

Source: Author's calculation based of SPSS 20.0

As it can be seen in Table 6, employee satisfaction factors that significantly affect the overall tourist satisfaction with the quality of services are salaries and rewards, followed by the work environment. Well-paid workers who work have good working conditions present the basis for providing quality tourism services in spa tourism, and, in this way, lead to the satisfaction of tourists with the quality of services.

The most important finding of the research is related to the correlation between the employee satisfaction and the tourist satisfaction with the quality of the service in Lukovo spa, and important correlations have been identified that indicate the relation of the factor of employee satisfaction with the overall tourist satisfaction with the quality of services. This finding confirms the direct and positive impact of employee satisfaction on the tourist satisfaction with the quality of services. Employee satisfaction has a

positive impact on the quality of the service, which directly affects tourist satisfaction with the quality of the provided services. In this sense, the results of this study are in accordance with the findings of previous studies in which researchers have also confirmed the impact of employee satisfaction on tourist or consumer satisfaction in the service sector in general (Chi, Gursoy, 2009; Harter, Schmidt, Hayes, 2002; Yee, Yeung, Cheng, 2008; Jung, Yoon, 2013; Spinelli, Canvos, 2000).

Besides the confirmation that employee satisfaction is related to customer satisfaction with the quality of services, it is important to note that the factors of reward system, salary satisfaction and satisfaction with the work environment and working conditions are statistically significantly correlated with the overall tourist satisfaction with the quality of services in spa tourism. Therefore, what makes the service a good quality service, and what motivates employees to be up to the task are in the first place of these three factors. This finding should not be taken literally, since other factors of employee satisfaction should not be ignored. However, as a key recommendation to human resources management in spa tourism, the need for effective policies regarding the rewarding system, improvement of the work environment and salaries of employees can be addressed in order to increase their motivation and satisfaction.

Conclusions

According to the results, all the tested hypotheses were confirmed which indicates a positive relationship between employee satisfaction and the quality of services, on the one hand, and between the employee satisfaction and the tourist satisfaction with the quality of services, on the other hand.

Apart from other factors influencing the choice of a particular tourist destination, a very important factor of the overall quality of service is communication and the attitude of employees towards the guests, because what is implied by the guest is that the service should be such as to enable favorable exploitation of the offered contents, from the beginning of the first contact at the reception desk to the use of various catering and tourist facilities offered contents. Communication with professional staff is the basis and it makes the image and provides the basic tone to the overall experience of spa tourism. Organizations in tourism industry cannot survive without the quality of tourism products. Moreover, the focus of quality of services in tourism is up to the employees. Therefore, it is of primary importance for the management of organizations in spa tourism to take care of their employees and to work on improving those factors that affect their dissatisfaction.

Based on the results of this research it can be said that it is important to pay attention to the working conditions and working environment of employees, relationships with the management, interpersonal relations in the collective, salary and reward system, as the main predictor of employee satisfaction in spa organizations. Also, when it comes to the category of the youngest employees and employees with shorter length of service, the most important factor of satisfaction in this category of employees is the salary, which is

important information in terms of motivating young workers. Special recommendation to the management of organizations in spa tourism, but also to tourism in general, refers to the need for more intensive promotion of gender equality and equal participation of employees of both genders in decision making and cooperation with the management.

It is necessary to point out certain limitations of this research and to take into consideration that a small sample of respondents does not provide the basis for some general conclusions and only allows a partial insight into the relation of employee satisfaction and the tourist satisfaction with the quality of services in spa tourism. Therefore, one of the recommendations for further research may be the necessity for a broader research, relationship and impact of employee satisfaction on the tourist satisfaction with the quality of services in the organization of spa tourism, both in terms of sample size and the number of organizations involved. Finally, it would be important to examine whether this research relates only to the segment of tourists in spa tourism or whether the research can be applied to other forms of tourism. In other words, it can be examined whether the employee satisfaction in organizations will have the same impact on the quality of services and thus on the tourist satisfaction with the quality of services in other aspects of tourism. This would enable the design of a theoretical basis that would enhance the understanding of the importance and impact of employee satisfaction on the quality of services and the tourist satisfaction with the quality of services, which is still at a low level in our country.

In today's business environment, human resource management must take into account the fact that one of the imperatives for organizations is to identify the needs of their employees and to meet these needs in order to ensure that employees are satisfied and then realize the goals of the organization. It is of crucial importance to promote the policy of good human relationships, to involve employees in the decision making process, to give more responsibility to employees, but also to value the merits of the employees in order for them to gain full confidence in the management and achieve their potentials.

Conflict of interests

The authors declare no conflict of interest.

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VEHICLE SCHEDULING IN A HARVEST SEASON

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ABSTRACT

The collection of agricultural goods is a very dynamic process which involves the coordination of hundreds of transport routes and machines with respect the processing capacities at a factory. Numerous fluctuations in the number of transport vehicles, malfunctioning on engaged machines and weather conditions make the process of planning and maximizing the utilization of all resources very difficult. In this paper we present a mathematical model and a heuristic algorithm that in a short period of time finds nearly optimal solutions, which enables a dispatcher to re-plan and update the collection plan according to new constraints.

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Introduction

Logistics activities in agriculture range from the simple transportation of goods between facilities, to highly interdependent harvesting process. For many small or medium agricultural associations, most of the transportation is organized on a modest level. As noted by Ali and Van Oudheusden (2009): “*most infield harvest operations are still performed without any detailed planning and the efficiency of the process relies mainly on the experience of the workers performing operations.*” Consequently, the transfer of grain between combines and tractors is delayed and machine performances are reduced. Economical aspects, as well as the accessibility of finances for transportation activities can be found in Sedlak et al. (2016), Fazekas et al. (2017) and Kontić and Vukasović (2017).

The collection of crops is carried out at the moment when the optimal yield is expected. Harvesting at the “right” moment in practice often implies the engagement of extensive agricultural machinery. According to Gebresenbet and Ljungberg, (2001), the load capacity utilization level of vehicles varies between 10 and 95%. Underused capacities of vehicles testify to the inefficiency of routes. An oversized number of tractors create queues at grain tanks, where experts record waiting times of up to 10 hours.

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As one of the measures to increase vehicle utilization and minimize the environmental impact, Gebresenbet and Ljungberg, (2001), assert to „*enable vehicle routing and scheduling to fit time windows, with integrated distribution and collection where suitable, as a complement to the drivers' manual route planning*”. We see the “integrated distribution and collection of goods” as a key to decrease the added value of agricultural products.

A comprehensive study (Fishpool (2016)) on efficiency of sugar beet supply chain addresses main issues of the process: “*In summary, the sugar beet supply chain is quite complex and in every area there is huge potential to lose yield or efficiency if not managed effectively. However, there is a great opportunity to use the current resources more efficiently by better planning, monitoring and co-ordination*”. López-Milán and Plà-Aragónés (2014) present a mixed integer linear programming model for an agricultural supply chain. The approach was tested on a sugar cane fields at Cuba. Lamsal, Jones and Thomas (2016) focus on problem minimization of number of trucks for the goods transportation from farms to processing plant. Computational tests were performed on sugarcane industry in Louisiana.

This research is focused on transporting agricultural goods from the fields to the factory. Our work was supported by data collected from transporting sugar beets used in sugar production. Although it seems as a rather simple task from a logistic point of view, it is also accompanied by a substantial amount of uncertainty in each part of the operation: a stochastic travel time, an unpredictable queues at loading and/or unloading machines, bad weather conditions, and malfunctions at involved machines. All these difficulties make planning both: arguable and vital for the successful processing of the goods.

The paper is organized as follows. In the next section we present a description of the problem. This is followed by a presentation of the model and algorithm for collection of agricultural goods. Afterwards, we present the results for the proposed algorithm, and in the last section we give some concluding remarks. Logistics activities in agriculture range from the simple transportation of goods between facilities, to highly interdependent harvesting process. For many small or medium agricultural associations, most of the transportation is organized on a modest level. As noted by Ali and Van Oudheusden (2009): “*most infield harvest operations are still performed without any detailed planning and the efficiency of the process relies mainly on the experience of the workers performing operations.*” Consequently, the transfer of grain between combines and tractors is delayed and machine performances are reduced. Economical aspects, as well as the accessibility of finances for transportation activities can be found in Sedlak et al. (2016), Fazekas et al. (2017) and Kontić and Vukasović (2017).

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Problem description

The collection of agricultural goods in peak season requires the efficient use of all resources: loading and unloading machines, transport vehicles and manpower. The underlying processes can be seen as a vehicle scheduling, or as a synchronization of machines involved in acquiring goods. During a typical day in a campaign, a dispatcher coordinates hundreds of vehicle tours, collecting thousands of tons of goods that can be processed according to the factory's capacity. The coordination of all machines with variable input parameters, relying only on dispatcher experience is far from optimal. Therefore, a responsive, robust and scalable system for tracking and planning the collection process is needed.

In a very simplified version, we consider the locations, machines and stocks of agricultural goods that need to be transferred between locations. The locations are factories and fields, and machines are transport vehicles, loaders and off loaders.

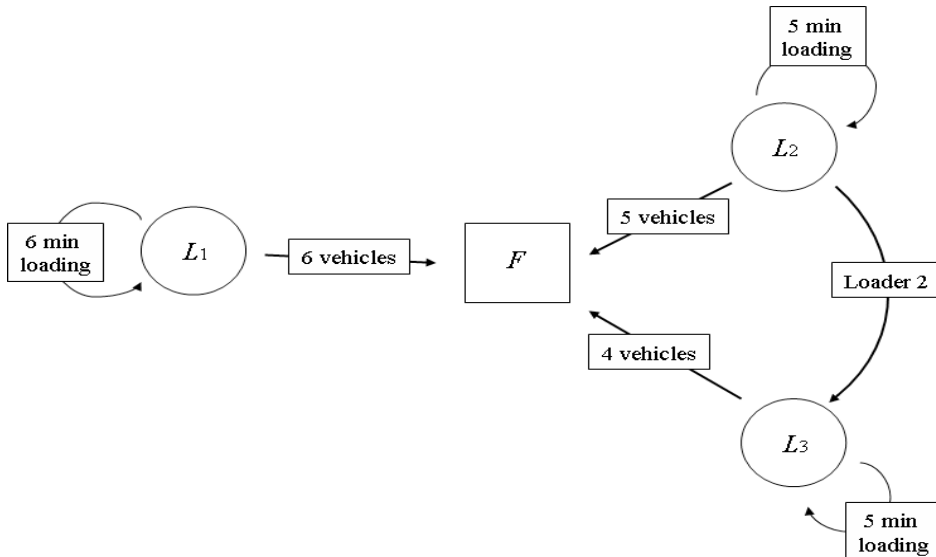
A factory that processes the agricultural goods has a container that defines the upper limit of the goods that can be inside the factory at each moment in time. The lower limit is defined by the inner processes of the factory, and can be seen as a security stocks. During a planning horizon, the level of goods at each moment has to be within the lower and upper limit. Each field has quantity of goods that needs to be transferred to a factory. In this problem, each field and a factory is connected via a path suitable for transport vehicles.

The stocks of goods are transferred to a factory using a fleet of vehicles. The vehicles are homogeneous regarding their capacity, but the number of vehicles fluctuates in respect to the harvesting dynamic of various agricultural goods. Each transferring operation consists of a loading time, a driving time and an unloading time, that are defined by a loading machine, a time matrix and an unloading machine, respectively. The utilization of the vehicles at loading/unloading spots is decided with respect to the formed vehicle queue. The loading and unloading operations are performed by the appropriate machines. During a planning day, a loading machine visits a number of fields, in respect to the order made by a dispatcher. Therefore, the synchronization of loaders and vehicles is essential in order to reduce the non-operating time of vehicles.

The goal of optimization is to minimize the queuing time, with quantities of goods at the factory within the defined limits, given the vehicle fleet, loading/unloading machines and fields with stocks of goods.

Example 1. For the sake of illustration, let us consider a small example including a factory F , three fields L_1, L_2, L_3 and two loaders 1 and 2. The stocks at locations require 6 vehicles at location L_1 , 5 vehicles at location L_2 , and 4 vehicles at location L_3 . Loader 1 with an operating time of 6 minutes visits location L_1 , loader 2 visits L_2, L_3 with an operating time of 5 minutes. The unloading time at the factory is 7 minutes.

Figure 1. Illustration of the processes in Example 1.



Model

We use time-span network concept for modeling transport between fields and the factory. A similar approach was used in a study by Bala, Brancov, Gvozdenović (2016) and Steinzen, Gintner, Suhl, Kliewer (2010). A set of all the locations involved in a planning horizon are denoted with Λ , $\Lambda = \{L_0, L_1, L_2, \dots\}$, where L_0 is a factory and L_1, L_2, \dots are the fields. Each location is associated with an operating machine $M = \{m_0, m_1, m_2, \dots\}$, where m_0 is an unloading machine and m_1, m_2, \dots are the loaders. Note that m_1, m_2, \dots are not all necessarily unequal. Each machine from the list has its operating time $t = \{t_0, t_1, t_2, \dots\}$. Operating times at each location $L_i \in \Lambda$ are used to discretize the timeline at each location $T_i = \{k \cdot t_i, k \in N\}$. For any two locations $L_i, L_j \in \Lambda$ a driving time is denoted with $time(L_i, L_j)$.

Suppose that loading machine m visits n locations $L_{m_1}, L_{m_2}, \dots, L_{m_n}$, with quantities requiring $v_{m_1}, v_{m_2}, \dots, v_{m_n}$ vehicles to transport all goods to the factory. And suppose that machine m starts its process at location L_{m_i} at time $\alpha_{m_i} \in T_{m_i}$, and ends at time $\beta_{m_i} = \alpha_{m_i} + v_{m_i} \cdot t_{m_i}$.

For each $x \in T_{m_i}, \alpha_{m_i} \leq x \leq \beta_{m_i}$, a ordered triple (L_{m_i}, x, y) where $y = \min \{t: t - (x + t_{m_i} + time(L_{m_i}, L_0)) > 0, t \in T_0\}$

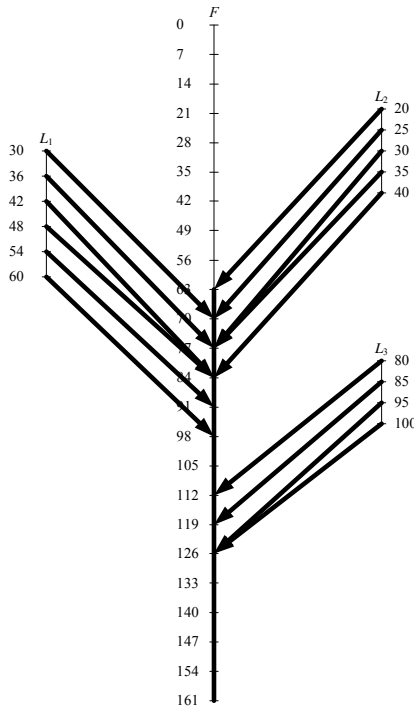
represents the actual transport of goods from the field L_{m_i} to the factory L_0 .

With the given α_{m_0} , start time of loading a machine at location L_{m_i} for $i > 0$, can be calculated using

$$\alpha_{m_i} = \min \{t: t - (\beta_{m_{i-1}} + t_{m_{i-1}} + time(L_{m_{i-1}}, L_{m_i})) > 0, t \in T_{m_i}\}$$

Example 2. For the input defined in example 1 with driving times: $time(L_1, F) = 40$, $time(L_2, F) = 30$, $time(L_3, F) = 35$, and $time(L_2, L_3) = 33$, On Figure 2 we represent the corresponding time-span network. The vertical lines are timelines between the factory and fields and the numbers are the times produced by the loading/unloading times of the machines.

Figure 2. Timelines for Example 2.



Each transport vehicle has a list of delivery tasks (L_j, x_j, y_j) , which develops into a list of driving tasks (L_j, z_j, w_j) that include waiting times at fields and the factory. A list is said to be feasible if each task (L_j, x_j, y_j) and its corresponding driving task (L_j, z_j, w_j) satisfies

- $w_{j-1} + \text{time}(L_0, L_j) \leq z_j, z_j \in T_j$ - driving time from the factory to the field,
- $z_j \leq x_j, z_j \in T_j$ - waiting time in a queue at the loader,
- $y_j \leq w_j, w_j \in T_0$ - waiting time in a queue at the factory.

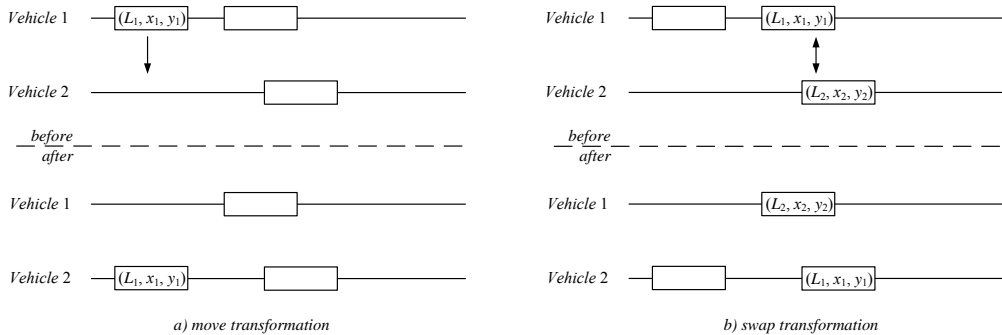
Note that $z_j < x_j$ if and only if there is a queue at the loader, that is if more than one vehicle has to be loaded at time z_j , implying $z_j + t_j \leq x_j$. Similarly $y_j < w_j$ if and only if there is a queue at the factory, that is if more than one vehicle has to be unloaded at time y_j or a quantity of goods at time y_j at the factory exceeds the upper limit of goods at factory. Note that $y_j < w_j$ implies $y_j + t_0 \leq w_j$.

A set of feasible driving lists constitutes a driving plan. A driving plan is feasible if all input quantities of goods are transferred to the factory while keeping the level of goods at the factory within the limits.

Solution strategy

To construct a feasible driving plan, we start from a solution with empty vehicle lists and a dummy list containing all tasks (L, x, y) . Clearly, this solution does not correspond to a feasible plan. Neighboring solutions are made via simple transformations of moving a task or swapping two tasks in a current solution. In this way, we consecutively build a solution that corresponds to a feasible driving plan.

Figure 3. Illustration of move and swap transformation



To achieve feasibility, we evaluate solutions respecting the not transferred goods, vehicle working time, and additionally power of waiting times at fields and factory.

A searching of the solution space is incorporated within the framework of a simulated annealing heuristic (see Černý (1985) and Kirkpatrick (1983)). For the evaluation value of the current solution (C) and neighboring (N), and the temperature T , the algorithm accepts the neighboring solution with probability

$$p = \begin{cases} 1, & \text{if } N < C, \\ e^{-\frac{N-C}{T}}, & \text{otherwise.} \end{cases}$$

Temperature T is adjusted after each transformation as $T := T \cdot q$, where $0 < q < 1$.

Computational results

The presented approach has been implemented as an algorithm in C++. The numerous test instances that were considered are real world instances provided by SUNOKO, the largest Serbian producer of sugar. The tests were conducted on a 64-bit PC with 2.70GHz processor and 4GB RAM.

The parameters that define the complexity of a test instance and the corresponding planning scenario are:

- Number of stack locations
- Total quantity of sugar beets that need to be transported to the factory and
- Vehicle capacities (mainly uniform).

The total number of tasks can be simply calculated from the stack quantities and the vehicle capacities in the case of a uniform fleet of vehicles. We assume that there is enough number of vehicles available. The solution strategy that is used tries to minimize the waiting time of transport vehicles, in order to maximize their re-use and minimize the queue at fields and the factory.

The algorithm was tested on dozens of instances, and the main characteristics of the results are a high degree of stability and minor differences in performance. Table 1 contains results for 10 instances whose number of loading points varies from 2 to 12.

Table 1. Numerical results

Instance	Number of stacks	Total quantity (tons)	Algorithm running time (s)	Number of tours	Waiting time in total time (%)
Input2	2	2858	8.042	90	4.07
Input3	3	1400	7.987	45	4.22
Input4	4	2116	8.347	77	2.36
Input5	5	2300	8.04	84	2.59
Input6	6	2897	8.027	93	5.05
Input7	7	2537	8.493	83	5.2
Input8	8	2884	8.068	92	4.8
Input10	10	5056	8.356	161	7.96
Input11	11	2325	8.784	67	7.06
Input12	12	6455	8.973	233	9.36

Conclusions and future work

In this research we present a model and a heuristic for the scheduling of transport vehicles in a harvest season. The problem involves hundreds of vehicle tours, and the loading and unloading of machines that have to be synchronized in order to achieve maximal utilization of all resources. The solution strategy is to minimize the waiting time of transport vehicles, in order maximize their re-use and minimize queue at fields and the factory.

The proposed approach was tested on collection of sugar beets, but the framework can be applied to other agricultural goods. The working time of the algorithm is between 8 and 9 seconds, handling up to several hundred of transport tasks and up to 12 fields on a typical day of a campaign. In less than 9 seconds of work time, the approach enables re-routing and adapting route plans to the dynamic changes of the input parameters such as the number of vehicles, suspension of machines due to malfunctions, stochastic driving, and load and unload times.

The next step in building a comprehensive tool is to include the plans of loaders' routes. We expect that such a holistic approach would generate a greater solution space, and consequently improve the synchronization of all machines involved.

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Conflict of interests

The authors declare no conflict of interest.

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PRESTIGE AND NATIONAL IDENTITY AS PREDICTORS OF FOOD PRODUCTS PURCHASE

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ABSTRACT

In modern living conditions, consumers have access to a greater offer of food products than ever before. In addition to local food products, the growth of foreign food products is noticeable, which significantly intensifies competition in this sector. The paper analyzes whether and how national identity and prestige affect the assessment of local food products and whether this assessment affects readiness to buy them. The research objective is to show whether national identity influences the purchase of local food products among consumers in Serbia, and whether prestige is important for the purchase process, as is the case with other product categories. The main research results indicate that the prestige factor has an impact on the assessment of both local and foreign food products, while the national identity factor has an impact only on local food product assessment. Also, research results indicate that food product assessment has an impact on the purchase of both local and foreign food products.

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Introduction

Consumers facing varying product offer from different countries of origin often prefer products from their own country (Verlegh and Steenkamp, 1999, Verlegh et al., 2007). Numerous studies examine the relationship between the product country of origin and national identity, which results in emotional attachment to home country products (Netemeier, 1991; Klein, 1998, 2002). In this regard, nationalism and patriotism, as well as the concept of consumer ethnocentrism emerge. The relevant literature makes a distinction between the concept of nationalism and the concept of patriotism. Generally, both terms relate to positive identification with a particular nation. However, nationalism

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implies superiority and dominance of one nation over others. On the other hand, patriotism, as a feeling of love for one's own country, does not imply national domination (van der Toorn, Nail, Liviatan & Jost, 2014). Patriotism is based on emotional attachment to one's own people, nationalism discriminates against members of other nations. Ethnocentrism is the attitude in which one's own group is in the center of everything, while all others are judged and ranked in relation to it (Shankarmahesh, 2006). The main consequence of consumer ethnocentrism is the consumer intention to buy local products, i.e. their unwillingness to purchase foreign products. On the other hand, there are many reasons for buying foreign products. By purchasing foreign products, consumers improve their status as well as their image in society (Strizhakova et al, 2008).

Literature Review

Prestige

There are many reasons why consumers prefer global to local brands. One of the reasons may be the higher perceived prestige of global brands (Kapferer, 1997). Holt et al. (2004) point out that one of the major associations related to global brands is their prestige. Global brands are, generally speaking, less accessible and more expensive than local alternatives, which can contribute to the creation of their prestigious reputation (Batra et al., 2000). Consumers themselves buy and use such products to improve their status as well as social image (Strizhakova et al, 2008). Some consumers, in addition, buy global brands to enhance their own image in terms of cosmopolitanism, sophistication, and modernism (Friedman, 1990). According to Ergin & Akbai (2010), the concept of brand prestige can mean different things to different consumers or consumers have different perceptions of prestige for the same brand. As Wong and Zhou (2005) point out, the perception of brand prestige has a greater impact on a purchasing intention when a product is in a category of high social visibility. The aim of this paper is to investigate whether this is the case with the purchase of food products.

Social prestige is reflected in consumer assessment of increased self-esteem and social status due to the possession and use of products belonging to the category of global brands (Steenkamp, Batra, & Alden, 2003). Numerous authors point out that one of the main consumer motivators to purchase global brands is the desire to improve their own status in society (Holt, 2002; Thompson & Tambyah, 1999). Many researchers define brand prestige as a subjective judgement on a relatively high status of a brand-related product (Stongkamp, Batra, & Alden, 2003; Truong, McColl, & Kitchen, 2009; Monga & John, 2010). This judgment is often accompanied by emotional reactions (Bagozzi, Gopinath, & Nier, 1999). Past studies provide empirical evidence to prove it (Holt, Quelch, & Taylor, 2004; Nan & Belk, 2004; Ger, 1999). This connection is especially emphasized in developing countries as consumers perceive brands from Western countries as symbols of prestige and status (Coulter et al., 2003; Batra et al., 2000). The reason for this is that consumers find a symbolic connection between global brands and the most developed countries from which these brands come, and that by purchasing these brands they want to acquire the lifestyle of consumers from these

parts of the world (Özsomer, 2012; Alden, Steenkamp, Batra 2006). In addition, by purchasing global brands, consumers want to get products that are used for the so-called conspicuous consumption. This is particularly pronounced in developing countries in which consumers tend to use global brand ownership and/or consumption to increase their social status and enhance identity and prestige (Batra et al., 2000). On the other hand, consumers in certain situations (when they are authentic) can also connect local brands with a high level of prestige. Some studies prove this assertion (Özsomer, 2012; Steenkamp, Batra, & Alden, 2003). Some studies on a target group of consumers living in developed Western countries point to preferences for local products (Balabanis, Diamantopoulos (2004)), while respondents in developing countries and emerging economies prefer foreign branded products (Marcoux et al., 1997, 9, Batra et al., 2000). Consumers consider branding or foreign products as a symbol of prestige, following trends and the latest lifestyles to improve their image in society (Zhou et al., 2008). These ideas are used in the paper to formulate the variable of prestige.

Steenkamp et al. (2003) suggest that brand prestige affects purchasing intentions, i.e. there is a positive correlation between prestige and purchasing intent. Yagci (2001) finds that brand image is an important factor that not only has an impact on the quality perception and consumer attitude towards products, but, at the same time, significantly influences consumer product purchase as a strong predictor of consumer purchasing intentions. On the other hand, Eze, Yee and Vamala (2012) discover the opposite. In their opinion, consumers do not form their product purchasing intentions based on brand image, which indicates that the brand does not have a priority impact on purchasing intentions. Shah et al. (2012) study how the branding concept influences consumer purchasing intentions. According to them, the main brand image consists of two elements, namely brand recognition and brand preferences, and both elements affect purchasing intentions.

Food product consumers, in addition to economic reasons and social belonging, pay special attention to quality when giving priority to local over foreign food products (Lusk et al., 2006). The country of origin labels on food products can influence the quality perception. In particular, the local country indication refers to the quality of traditional production methods and induces perceptions of trust and self-confidence (Von Alvensleben, Gertken, 1993).

The aim of this study is to analyze whether the image is important in the purchase of food products, i.e. if purchase be considered prestigious. Bearing in mind the above-stated theoretical claims and results of previous empirical research, the following research hypotheses are defined:

H1: Prestige has a positive and statistically significant influence on the assessment of local food products.

H2: Prestige has a positive and statistically significant influence on the assessment of foreign food products.

National identity

The significance of an individual's national affiliation, as well as subjective significance of the inner connection with the nation, is a national identity (Blank & Schmidt, 2003). Nakata and Sivakumar (2001) define national identity as a set of thinking, feeling, and action patterns, derived from conventional and accepted conventions and values of a particular society. It is a degree in which individuals identify themselves with their own nation and have a positive sense of belonging to it (Tajfel, Turner 1986). The strength of national identity is operationalized as a subjective and multiple construction consisting of: individual's perception of common origin, feelings of common socio-cultural experience, interactions, values, and norms, as well as feelings of belonging, pride, and commitment to a particular national group (Cleveland, Rojas-Mendez, Laroche, & Papadopoulos, 2016).

There are studies that focus on the effect of differences in the strength of individuals' national identity on the assessment of local and foreign products. Verlegh (2007) proves that national identity has an impact on the assessment of quality and desire and readiness to purchase different categories of local products, including food products, while the negative impact of identity on readiness to purchase foreign products is revealed only in two of eight product categories. Zeugner-Roth, Žabkar, & Diamantopoulos (2015) conduct a study stating that national identity has a stronger positive impact on the rating and readiness to purchase local products than ethnocentrism, while in foreign products national identity affects positively the rating, but not readiness to buy.

The country of origin concept, covered by the definition of a "geographical indication", provides the basis for identity, diversity, tradition, and authenticity – individual and social, local, and national (Almli et al., 2011). Food can be used as a metaphor for diversity and to promote cultural superiority. The identity of the national cuisine has to do with geographical boundaries and regional identities (van Ittersum, 1999). Some researchers assume that territorial or regional identity is more shaped by their typical food than language or dialect (Petrini, 2011; Parasecoli, 2005).

Public campaigns focus on the danger of losing national identity and try to provoke national feelings, but also to evoke the feelings of consumers' duty towards local economy (Parasecoli, 2005). Normative reasons for buying local food products play a major role where local agribusiness is threatened by imports. In addition, information on the food country of origin may be a general quality indicator when other information is not available. Basically, it is the quality perceived by the consumer, rather than the "objective" quality that influences the consumers' decision-making process (Knight et al., 2007; Saenz-Navajast et al., 2014). Objective quality is defined by the total number of product attributes including its origin, ingredients, and all attributes that can be detected by food analysis. Subjective quality is defined by personal quality evaluation, so each consumer has their own quality definition and requirements. The most important aspects of food quality are certainly related to taste and safety, including production processes and product performance (Bachl, 2011; Ortega et al., 2014). In

this paper, the subjective quality of food products is examined, among other things, under the influence of national identity.

Parrot (2002) makes a distinction between northern and southern food culture. Northern food culture is characterized by “efficient” production, while southern food culture, which sees food consumption as hedonism (Gomez and Torelli, 2015), is characterized by tradition and craft production, and the connection of healthy eating with typical and local products (Balestrieri i Brunori, 2003).

Buying food products, among other things, depends on the national context in which consumers live. In Serbia, according to one study, consumers are motivated by quality when buying local food, but also prefer local food regardless of quality, due to moral beliefs about the support to the local food economy (Bosbach et al., 2015).

The aim of this paper is to examine whether consumer national identity is expressed in Serbia and whether it has an impact on food product assessment and purchase. Based on the theoretical statements, the results of the previous research, and the goals set in this paper, the following hypotheses can be defined:

H3: National identity has a positive and statistically significant impact on the assessment of local food products.

H4: National identity has a positive and statistically significant impact on the assessment of foreign food products.

Product assessment based on the country of origin

The effects of the country of origin (COO) mean that certain consumers show positive or negative tendency to purchase different products, depending on the country of origin with which they associate them (Magnusson et al., 2011; Josiassen & Harzing, 2008; Verlegh & Steenkamp, 1999). Many authors conclude that the country of origin of products and services has an impact on product assessment and purchasing behavior of consumers (Pharr, 2005; Sharma, 2011; Verlegh & Steenkamp, 1999; Peterson & Jolibert, 1995). The product country of origin influences consumers’ product assessment, because they use all available product information when evaluating it (Kaynak & Kara, 2002). In this study, the effect of the food product country of origin is considered through product evaluation and the impact of evaluation on consumers’ readiness to buy products.

Hong & Wyer (1989) indicate that the country of origin serves as a very important basis for consumers’ product and service assessment. Many authors consider the product country of origin and its image to positively or negatively affect the assessment of products coming from these countries (Costa et al., 2016; Chen et al., 2014; Laroche, et al., 2005). According to Laroche et al. (2005), product assessment refers to a set of attitudes the consumer has about the product, which is expressed by the liking, satisfaction of having a product, and the desire to buy it. When assessing products and services, consumers analyze certain internal characteristics that are directly related to

the product and are physically tangible (design, shape, color), as well as external ones, which are less tangible (price, guarantee, brand, name of the manufacturer, and product country of origin) (Verlegh & Steenkamp, 1999; Manrai et al., 1998). The second group of characteristics gets important when consumers cannot completely objectively evaluate the product.

Readiness to purchase a product differs from the consumer intention to make a purchase, in terms of the necessary expenditure to actually buy a product or service (Koschate-Fischer et al., 2012). Sun and Morwitz 2010) point out that intentions are time-varying and that they do not have to accurately predict the real behavior of consumers. It is therefore important to examine whether consumer intentions will be realized. The purchase intention arises from the product evaluation, i.e. benefits that must be greater than the product cost. This correlation of product evaluation and readiness for purchase is described in numerous studies (Zeugner-Roth et al., 2015; Josiassen, 2011; Klein et al., 1998).

Koubaa (2008) finds that the image of the product country of origin is of great influence on the consumer perception about the product image. Similarly, according to Hsieh et al. (2004), when consumers have a favorable perception of the brand's country of origin, they also appreciate brands from that particular country, which, in turn, improves the brand image, and vice versa, the negative image of the country of origin in the eyes of consumers prevents them from buying brands from that country. It is found that the image of the country of origin directly affects the purchasing intention of consumers (Josiassen & Assaf, 2010; Wang & Yang, 2008). However, other researchers such as Diamantopoulos et al. (2011) prove that the image of the country of origin indirectly affects consumers' intentions to buy foreign products through the brand image. Most COO literature deals with the purchase of durable but not food products. Few studies examine the influence of the country of origin on the propensity to purchase local food products (Eriksson, 2011; Ellison et al., 2010; Knight, 2007; von Alvensleben et al., 1993). The aim of this paper is to fill this research gap.

The paper examines the impact of product assessment on the consumers' readiness to purchase local and foreign food products as part of the overall effects of the country of origin through the following hypotheses:

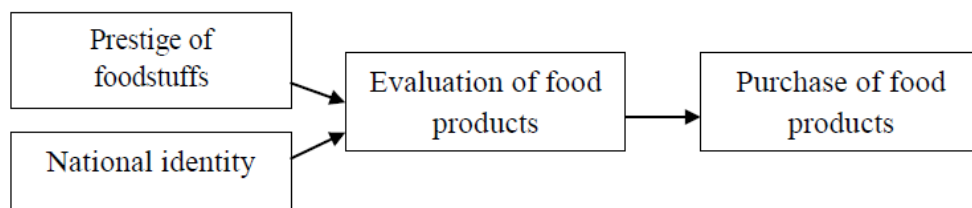
H5: Positive assessment of local food products by consumers positively influences their purchase of local food products.

H6: Positive assessment of foreign food products by consumers positively influences their purchase of foreign food products.

Materials and methods

Bearing in mind the analyzed variables and hypotheses, a conceptual research model can be defined. The model (Figure 1) shows that variables related to food product prestige and national identity influence the assessment of these products, and that food product assessment affects the purchase of this product type.

Figure 1. Conceptual research model



In order to analyze the previously established links, a survey covered the territory of Šumadija. The survey was conducted in February 2018, with a total of 146 valid questionnaires collected. In the structure of the sample, most of the respondents were women (53.4%). In addition, the largest percentage of respondents were members of younger and middle-aged generations (close to 80%), with secondary education (48.5%). The data was obtained by distributing the questionnaire personally, with the respondents evaluating the degree of their agreement with the stated items on the seven-point Likert scale (1 – I strongly disagree, 7 – I strongly agree).

Statistical data processing and analysis were performed using Microsoft Excel and SPSS (Statistical Package for Social Sciences, 21.0) software packages. Of statistical analyses, descriptive statistics analysis, exploratory factor analysis, simple and multiple linear regression were used.

Results

In order to group the questionnaire statements into factors, exploratory factor analysis is performed, giving three factors, referring to the observed variables in the research model. The value of the Kronbach alpha coefficient (Table 1) is significantly higher for all factors than the recommended value of 0.7 (Nunnally, 1978), which shows that the factors have a very good internal consistency. Indicators that must be considered when assessing the justification for exploratory factor analysis are Bartlett's test of sphericity and Kaiser-Meyer Olkin's (KMO) sample adequacy indicator. The KMO indicator value in this study is 0.799, while Bartlett's test of sphericity has a statistically significant value (Sig. = 0.000), which indicates that the use of factor analysis is justified. The total percentage of variance explained by these three factors is 79.63%.

Table 1. Results of exploratory factor analysis

Items	α
<i>Prestige of local food products</i>	0.930
<i>Prestige of foreign food products</i>	0.915
<i>National identity</i>	0.868
<i>Bartlett's test of sphericity</i>	Sig.=0,000
KMO	0,799

Source: Authors' calculations

The results of descriptive statistics (Table 2) show that the respondents gave the highest rating to the national identity (AS = 5,739, SD = 1,214) variable. On the other hand, variables Purchase of foreign food products (AS = 3.736, SD = 1.665) and Prestige of local food products (AS = 3.827, SD = 1.590) had the lowest rating.

Table 2. Results of descriptive statistics analysis

Items	AS	SD
<i>Prestige of local food products</i>	3.827	1.590
<i>Prestige of foreign food products</i>	4.227	1.644
<i>National identity</i>	5.739	1.214
<i>Assessment of local food products</i>	4.646	1.385
<i>Assessment of foreign food products</i>	4.424	1.346
<i>Purchase of local food products</i>	5.061	1.425
<i>Purchase of foreign food products</i>	3.736	1.665

Source: Authors' calculations

In order to test the hypotheses, two multiple and two two-dimensional regression analyses were used. The results of these analyses are presented in Tables 3, 4, 5, and 6.

The results of multiple linear regression shown in Table 3 indicate that the prestige of local products ($\beta = 0.243$, Sig. = 0.002) and national identity ($\beta = 0.364$ Sig. = 0.000) have a positive and statistically significant influence on the assessment of local food products. This **confirmed the hypotheses H1 and H3**.

Table 3. Results of multiple regression (dependent variable – Assessment of local food products)

Hypothesis	Variable	β	t	Sig.	VIF
H1	Prestige of local food products	0.243	3.235	0.002	1.035
H3	National identity	0.364	4.852	0.000	1.032

Source: Authors' calculations

When it comes to foreign products, it can be noticed that the prestige of foreign food products has a positive and statistically significant impact on assessment ($\beta = 0.331$, Sig. = 0.000), while national identity has no statistically significant impact on the assessment of this product type ($\beta = 0.016$, Sig. = 0.842). This **confirms hypothesis H2, but not the H4 hypothesis**.

Table 4. Results of multiple regression (dependent variable – Assessment of foreign food products)

Hypothesis	Variable	β	t	Sig.	VIF
H2	Prestige of foreign food products	0.331	4.192	0.000	1.002
H4	National identity	0.016	0.200	0.842	1.005

Source: Authors' calculations

It should be pointed out that multicollinearity is not a problem in the presented analyses, since the variance inflation factor (VIF) is lower than the recommended value of 5, in the case of the impact of both factors on the assessment of both local and foreign food products (Field, 2000).

Table 5. Results of linear regression (dependent variable – Purchase of local food products)

Hypothesis	Variable	β	t	Sig.
H5	Assessment of local food products	0.477	5.997	0.000

Source: Authors' calculations

Study of the impact of food product assessment on their purchase was done through a simple regression analysis (Tables 5 and 6). The above analysis shows that, in the case of local food products, consumers' assessment has a positive and statistically significant influence on the purchase of these products ($\beta = 0,477$, Sig. = 0,000). This **confirms the H5 hypothesis**.

Table 6. Results of linear regression (dependent variable – Purchase of foreign food products)

Hypothesis	Variable	β	t	Sig.
H6	Assessment of foreign food products	0.491	6.768	0.000

Source: Authors' calculations

When it comes to foreign food products, product assessment also has a strong, positive, and statistically significant influence on the purchase of food products ($\beta = 0,491$, Sig. = 0,000). This **confirms the H6 hypothesis**.

Conclusion

The paper analyzes the influence of prestige and national identity on the assessment and purchase of food products. The results show that the respondents gave the highest rating to the variables related to national identity (AS = 5,739). On the other hand, variable Purchase of foreign food products (AS = 3.736) had the lowest rating, which supports the aforementioned. The results of the analysis also show that the prestige of local products and national identity have a positive and statistically significant impact on the assessment of local food products, which is consistent with the results of previous researchers like Yagci, (2001); Verlegh, (2007) and Zeugner-Roth et al. (2015). This confirmed the hypotheses H1 and H3. The influence of nationalism on quality assessment of local food products in Serbia was also proven in the study by Bosbach et al. (2015). The analyses carried out in this paper point to the influence of prestige but not of national identity on the assessment of foreign food products. This confirmed H2 hypothesis, but not the H4 hypothesis, which can be, among other things, explained by the results of previous studies, stating that openness towards other cultures and ethnocentrism in Serbia are not in contradiction in the assessment of food products. One of the conclusions drawn from the conducted analysis in this

paper is that consumers' assessment has a positive, statistically significant impact on the purchase of both local and foreign food products, thus confirming the H5 and H6 hypotheses. The results are in line with the research carried out in Serbia by Bosbach et al. (2015), which indicates the existence of a positive, statistically significant impact of quality assessment on the purchase of food products. The conducted research has certain limitations. One of them is that it was not conducted on the whole territory of Serbia, which would increase the representativeness of the sample and generalize the conclusion. Another limitation is that the largest percentage of respondents belonged to youth and middle-aged groups, with secondary education. Also, the analysis did not include other factors that influence product perception and purchase, which could be the subject and objective of future research.

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Conflict of interests

The authors declare no conflict of interest.

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APPLYING INTELLECTUAL CAPITAL IN IMPROVING AGRI-INDUSTRY AT REPUBLIC OF SERBIA

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ABSTRACT

Analysis of the economic framework for doing business between Serbia and Autonomous Province of Kosovo and Metohija, that is under the interim civil and military administration of the United Nations, according to UN Resolution 1244 (hereinafter referred to as Kosovo*) aims to point of the need to eliminate barriers in doing business between Serbia and Kosovo*, making recommendation for improving the business environment. The research involved experts analyzed legal regulations governing the business environment in Kosovo* and carried out the research. They interviewed business people and representatives of companies from central Serbia and Kosovo*. The results of the survey enable the creation of a wider picture of company operations when crossing of the administrative crossings, identifying disturbances in the passage of goods and services, as well as formulating proposals to overcome existing barriers in doing business between business entities in central Serbia and the Autonomous Province of Kosovo and Metohija.

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Introduction

In the accession process towards the European Union, the Republic of Serbia has opened twelve chapters until the end of 2017. Within the framework of the accession negotiations, Chapter 35 on other issues – “normalisation of relations between Serbia and Kosovo*” was opened in December 2015. In order to adequately monitor the

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economic relation between Serbia and its autonomous province Kosovo and Metohija, that is under the interim civil and military administration of the United Nations, according to UN Resolution 1244 (hereinafter referred to as Kosovo*), it is necessary to look at the macroeconomic and business environment, as a whole. This analysis has very high importance which stems from the need to improve the economic environment and point out the need for elimination the barriers in business operations. In this paper the focus is in on the agro-industry, as one of the most perspective branches in Republic of Serbia. The aim is to emphasize the importance of using intellectual capital in this area as the knowledge that needs to leverage into the market value (Roos et al., 1997; Spender and Grant, 1996). There are three basic components of intellectual capital: human capital, structural capital and relational capital (Martín de Castro, G et. al., 2005). Human capital is the knowledge which groups or people possess, as well as their ability to generate and reinforce it. Structural capital refers to the combination of knowledge and intangible assets derived from the processes of action which are property of the organization and which remain in it. Finally, the heterogeneity of external agents recommends the explicit distinction between business capital and social capital, both included in the relational capital component as can be seen in (Euroforum, 1998; Bueno, 2001), or in the customer capital (Stewart, 1997). Both human capital, structural capital, as well as relational capital are very important in the overcoming the barrier between the agro-industrial actors in both sides.

It has often highlighted that trade of agricultural products and livestock is difficult due to EULEX insists on compliance with EU rules, whilst many products from Serbia do not meet EU standards required in Kosovo*. Namely, only 6 out of 30 slaughter houses in Serbia meet EU requests and standards. This shows that this sector in Serbia is not yet ready for EU integration, so that institutions such as the Chamber of Commerce and other associations of agricultural producers should devote efforts to remove this deficiency. This is in the interest of development of agriculture and livestock farming in Serbia itself, because they will be able to export products to Kosovo* market as well as the broader market like the EU. This is relevant for Kosovo* due to about 60% of its population is rural, and agriculture accounts from 25% to 35% of the total employment, and agricultural arable land accounts for about 53% of the entire territory. However, agriculture accounts for only 12.9% of GDP.

Agricultural production is largely of mixed type, it uses very old, traditional methods and it is inefficient. Livestock has almost disappeared, farm machinery is damaged, and production equipment is obsolete. There is great potential for the development of all types of agriculture in North Kosovo*. The potential is still insufficiently used primarily due to a low level of education of farmers, fragmented agricultural land, insufficient or very poorly maintained irrigation systems, limited capacity for processing and marketing of agricultural products. Animal husbandry, like agriculture, is faced with the difficulty of obtaining raw materials, insufficient application of animal husbandry technology, poorly developed infrastructure and outdated approach. In order to move from the individual to highly efficient production it is necessary to invest in

specialized farms, mini-farms, which have self-sustaining resources, it is necessary to establish a network of control and veterinary care, as well as to search for solutions through associations of farmers.

Analysis of the economic framework for doing business between Serbia and Kosovo*

The legal and regulatory framework applied to exchange of goods with Kosovo* is based on the following documents:

- Regulation on special conditions for the circulation of goods with Kosovo*;
- Regulation on Enforcement of the Law on VAT in the territory of Kosovo for as long as the UN Security Council Resolution 1244 is effective;
- Regulation on Enforcement of the Law on Excise Duties in the territory of Autonomous Province of Kosovo* for as long as the UN Security Council Resolution 1244 is effective Article 309 of the Customs Law (Official Gazette of RS, No. 18/2010 and 111/2012);
- Provisions of this Law are applied also to the exchange of goods with Kosovo* for as long as the UN Security Council Resolution 1244 is effective;
- Provisions contained in rules related to foreign currency and taxes.

Article 309 of the Customs Law also specifies that its provisions shall apply *mutatis mutandis* to circulation of goods with Kosovo* as long as the UN Security Council Resolution No.1244 is effective with the aim to ensure orderly and uniform conduct its (Official Gazette of RS, 2010). Circulation of goods with Kosovo* is organized in the following way: when the goods from Kosovo* arrive outside Kosovo* the person who brought the goods shall submit to the relevant customs authority at the administrative line the transit document by which the goods are directed to the customs posts for further customs processing. The customs (transit) declaration is filled out pursuant to Articles 6, 7 and 14 of the Rulebook on the form, content, manner of submission and filling out the declaration and other forms within the customs procedure (Official Gazette of RS, 2010). At the customs post of destination the customs declaration is filled out pursuant to Articles 12, 13 and 14 of the mentioned Rulebook, in case that the Unified Customs Document (UCD) for release for free circulation, temporary import, active refinement, re-import, processing under customs control, customs warehousing and destruction of goods was submitted. The customs authority checks compliance with all required terms, including the bank guarantee, and calculates and charges the import fees where customs debt occurred. Goods arriving from Kosovo* to Serbia are released for circulation with VAT calculated and paid pursuant to the Law on Value Added Tax. For excisable goods coming from Kosovo* to Serbia, excise duties are charged pursuant to the Law on Excise Duties. The customs authority controls the submitted declaration to check whether the accompanying documentation is harmonized pursuant to the CEFTA agreement. CEFTA is the second biggest export market by importance for companies in Serbia after the European Union market. Products from Serbia are very recognizable at these markets.

Kosovo* is member of the CEFTA Agreement (which on behalf of Pristina was signed by UNMIK). In case of goods subject to for mandatory prior approval of the authorized inspection service, such goods shall be allowed to enter Serbia only if such permission had been issued. Foreign goods shipped from Kosovo to Serbia are subject to paying customs fees, other import duties, excise duties and VAT (CEFTA, 2006).

Goods which have not commercial nature and which are carried by persons (passengers) are reported to the customs authorities and present subject to payment of customs duties, other import related fees, excise duties and VAT. The goods for personal use which passengers are carrying with them, are granted relief from customs duties and other import fees. The Regulation on Enforcement of the Law on Excise Duties in the territory of Kosovo* for as long as UN Security Council Resolution 1244 is effective, determines the ways in which this Law shall be implemented (*Official Gazette of RS*, Nos. 22/01, 73/01, 80/02, 80/02-suppl.law, 43/03, 72/03, 43/04, 55/04, 135/04, 46/05, 101/05-suppl.law, 61/07, 5/09, 31/09, 101/10, 43/11, 101/11, 93/12 119/12 and 47/13) in Kosovo in the period in which UN SC Resolution 1244 is in force (*Official Gazette of RS*, 2013). Where the excise debtors from Serbia are directing excise goods for circulation to Kosovo*, the excise duties shall not be charged if these goods are carried to Kosovo*. A verified copy of the Unified Customs Document serves as proof that the excise goods were carried to Kosovo*. It confirms that excise goods left Serbia in Kosovo*, along with excerpts from the business account of the excise debtor proving that money from the business account of the receiver of excise goods was transferred to the account of the excise debtor (supplier of excise goods). Excises for goods shipped from Kosovo* for circulation in Serbia are calculated and paid pursuant to the Law.

The Customs Administration implements the Foreign Trade Law and the Decision also in case of control of circulation of the goods from Kosovo*. For circulation of goods from Kosovo*, participants in customs procedures submit to the customs authorities documents determined in the above regulations except in case of circulation of goods which are subject to phyto-sanitary, i.e. veterinary and sanitary control. In case of such goods exchanged with Kosovo*, the difference is that instead of the document approving the import of plants, pesticides or fertilizers, or the common veterinary entry document, minutes of performed controls issued by the phyto-sanitary i.e. veterinary inspection, must be submitted, according to Regulation on special terms applied to exchange of goods with the Autonomous Province of Kosovo and Metohija. *Official Gazette of RS*, Nos. 86/2010, 61/2013, 111/2013 and 17/2014. Decision on Determining Goods for Import, Export or Transit for which Certain Documents are Required is published in *Official Gazette of RS*, No. 32/2015, Ruling of the Customs Administration, Sector for customs operations and procedures 148-03-091-03-533/7/2016 of 2 November 2016.

Pursuant to the Instruction of the Ministry of Agriculture and Environmental Protection, the Plant Protection Directorate and Veterinary Directorate control the circulation of goods which are transported from or delivered to the territory of Kosovo* are subject to phyto-sanitary or veterinary inspection. Until 2012, the Certificate on internal circulation applied to all goods shipped to Kosovo*. However, today all goods entering from third

countries and directed to Kosovo* must be accompanied with status-neutral documents. The goods enter the territory of Kosovo* through joint crossing points and are subject to inspection controls which should confirm that the goods did not remain in Serbia.

Research Methodology

In order to improve the business environment in the area of agribusiness it is necessary to identify and register the barriers to business operations. Considering the identified general and specific problems which legal persons in different fields of agribusiness are facing, it has been suggested how to solve these problems. The research offers insight into the real situation, it draws attention to ways in which trade is restricted and suggests how to eliminate barriers in order to realize normal movement of goods and services between Serbia and Kosovo*. To this end, a special part of the research refers to the analysis of the implementation of the CEFTA agreement between Serbia and Kosovo* and recommendations for removing delays in the implementation of signed agreements.

Based on the available data on active business entities that have business relations with Kosovo*, a representative sample of companies and competent institutions have been selected. The selection of target companies was defined according to the value of regular traffic with Kosovo* in 2015 and 2016, taking into account the greater geographical representation and diversification of the activity code. The methodological basis of the research was sending a specially prepared questionnaire to the addresses of 120 companies in the Republic of Serbia and Kosovo* as well as organizing and conducting interviews with companies in Serbia and Serbian companies in Kosovo*, as well as with relevant institutions. In order to obtain adequate conclusions, the in-depth interviews with the relevant institutions in Serbia were conducted. The relevant institutions are: Customs Administration (Ministry of Finance), Veterinary Directorate (Ministry of Agriculture and Environmental Protection), Border Phytosanitary Inspection (Ministry of Agriculture and Environmental Protection), the Office for Kosovo and Metohija of the Government of the Republic of Serbia. The analysis has used the primary data collected by the field investigation of customs checkpoints (customs office in Vranje) or joint points of the Končulj pass. The main sources of secondary data were the selected databases of the Serbian Chamber of Commerce, the Customs Administration and the World Bank.

The approach used during the research was aimed at presenting the real situation in the field and contribute to better informing business people about the business conditions at Kosovo*. By enhancing communication between businessmen, on the one hand and relevant institutions, on the other hand, significant results in the field of business environment ambitions can be achieved.

Results

During the research, 120 e-mails were sent to the companies in Serbia and 30 e-mails to the companies in North Kosovo*. Representative sample consists of 65 companies which answer the questions from the questionnaire. The structure of the representative

sample shows that 10 companies are from Belgrade, 12 are from Vojvodina, 28 companies are registered in Central and Southern Serbia (Leskovac, Vranje, Bujanovac and Preševo) and 15 companies are from North Kosovo*. The specially prepared questionnaire consisted of 13 open-ended questions which are given below:

Table 1: The questionnaire in the research

No.	Question
1.	The name of the agricultural product that have been imported/exported.
2.	Do you have any difficulties in obtaining documentation accompanying goods when exporting/importing/transiting?
3.	Besides the obligatory documents accompanying the goods when importing/exporting/transporting, do you require additional documents?
4.	Have you encountered a situation that certain documents do not recognize you at administrative crossings?
5.	Do you have problems with administrative crossings with competent services (customs, border police, veterinary inspections, phytosanitary...)?
6.	Are the services and inspections at the administrative crossings coordinated and whether their working hours are harmonized?
7.	Are you facing double taxation of excise taxes and VAT, as well as the calculation of transport costs higher than real ones - free assessment by the customs officer?
8.	Have you encountered the situation that the services and inspections at the administrative crossings violate the CEFTA agreement?
9.	Did you have any problems with the treatment of goods transit through Kosovo*/Serbia?
10.	Did you have any problems with the collection of your receivables, in particular with regard to insurance of business (bank guarantees, insurance of claims, etc.)?
11.	Do you encounter a lack of adequate infrastructure in your day-to-day business (traffic, inadequate conditions at administrative crossings, telecommunications, payment transactions, insurance...)?
12.	Have you dealt with unfair competition (the price of dumping, the favour of certain companies, the hidden monopolies, irregularities in public procurement procedures, etc.)?
13.	Point out the barriers that you had in the store, which are not covered by this questionnaire.

The research process was performed by using two iterations. Firstly, questionnaire was sent to the selected companies by e-mail. Secondly, a deep interview was organized in order to define more detailed problems which related to the specific activity which companies deal with. During the research, 46 deep interviews with companies were conducted. The analysis of the obtained data was aimed to create clear picture of the business operations for companies which export/import/transit goods to/from the Republic of Serbia. A representative sample of companies is classified according to the official classification of activities according to the Statistical Office of the Republic of Serbia (Republic Institute of Statistics, 2018).

Discussion

In this part of the paper we give another view of the identified specific problems with which companies have faced in business. These problems are classified by type activity. Results obtained during the research show that in Sector: Agriculture, Forestry

and Fishery (Field: Growing annual and biennial plants (growing of cereals, except for rice, leguminous and oleaginous plants), companies from Serbia which produce cereals, leguminous and oleaginous plants are facing the following problems while exporting to Kosovo*:

- It is necessary to register the varieties with Kosovo* institutions due to they do not recognize the existing registration in Serbia;
- Unfair competition. Local processing companies are protected and Kosovo* process or pressurize customers not to buy goods from Serbia.
- Reduced circulation and low price of wheat in 2016;
- Small number of phyto-sanitary inspectors in the field is additionally slowing down the circulation of goods.

In the Processing industry (Field: Food production), identified problems faced by companies from Serbia which produce and sell food products in Kosovo* refers to:

- Voluminous export documentation. Food export to Kosovo* is required the following documents: invoice, packing list, phyto-sanitary certificate, veterinary certificate and certificate of quality for the product. These are issued by authorized institutions, and shall not be older than six months. If the goods are exported to FYR of Macedonia, namely if they transit the territory of Kosovo*, apart from the mentioned documents it is necessary to also have the security certificate. The export of food products to the EU market is realized without the mentioned certificates. Specifically, the exporter issues the document which guarantees that the goods are safe in terms of health and which is sufficient for exporting to the EU market;
- Obtaining and harmonization of documentation. This relates, first of all, to the EUR1 certificate of origin of goods and the veterinary certificate which is different for the internal and international circulation;
- Time and costs related to obtaining export documentation. It takes one to two days to obtain the necessary documents. For each export, the documents cost about 100 euros, i.e. each in voice must have a phyto-sanitary certificate, a veterinary certificate and the analysis of the quality of product. Goods are invoiced in euros, and the certificates are controlled by the Kosovo* side at the crossings;
- The declaration of products may be one of the barriers to unimpeded crossing. Companies use the formulation “distributor” on the declaration of the product, and not “exporter”. The designation “Kosovo” is acceptable if it is not preceded by the word “Republic”;
- Temporary blockage. A one-time ban on import of animal goods lasted for one year.
- Collection of claims is periodically impeded (impossible), due to insolvency of debtors;
- Collection of claims through out-of-court collaterals (blank bill) or enforcement based on credible documents is impossible once the debtor is blocked due to forced collection;

- Due to afore mentioned facts, the export of food products to the EU market is simpler because it requires less documents and is cheaper when compared with the export of goods to the market regulated by the CEFTA Agreement.

Payment operations with Kosovo* functions by making payments mainly in advance and from the bank accounts, whilst in cases where payments are made in cash, these are most often illegal. As regards competition and conduct of competitors, major competitors for Serbian companies are local producers and companies in the neighborhood.

Most of the companies in the meat industry (branch: processing and conservation of meat and meat products) in Serbia do not export their products to the Kosovo* market. Processed meat from Serbia is neither present in big quantities in north Kosovo*. As the main reason mentioned are problems regarding harmonization of veterinary certificates, which has a discouraging impact upon business activities. Those who decide to export lasting and semi lasting meat products to the Kosovo* market are facing with the following problems:

- The major barrier is the non-harmonized veterinary certificate which is necessary for the circulation of goods of animal origin and is a mandatory part of the export documentation;
- Since July 2016 fresh meat and grilling meat is not exported to Kosovo*, because in force is a ban on export of meat to this market. The situation regarding the cattle's lumpy skin disease had caused a temporary ban of cross-border and partly also internal circulation of beef. However, the ban on exports to north Kosovo* applies both to pork and beef, and the result was that trucks were stopped in the intermediate zone. As regards the ban of exchange with other countries in the region, companies were informed on this by the Veterinary Directorate's document; as regards the ban of export to Kosovo* they received an oral on-site information from the veterinary inspectors;
- In order to realize the import, the customer must be registered with the institutions in Pristina and must have the license to import meat. The goods are directly delivered to shops in north Kosovo*, and payments were made in RSD;
- The sanitary examination is paid for each invoice at the administrative crossing (around 60 euros). Importers (shops) are associating and importing using one invoice in order to reduce costs for the sanitary examination of the goods;
- It is the practice that the exporter from Serbia pays VAT instead of the importer, and afterwards, during the business operation, the amounts are returned, which additionally complicates the procedure. For all goods, VAT is 19%.
- It cannot be predicted how long the trucks are going to be kept there; when they are going to cross is unpredictable and uncertain. These goods have a short shelf life, and they are allowed to wait only for up to two or three days;
- Customers from north Kosovo* have a problem because they must obtain the documentation from authorities in Pristina. There are frequent changes of the documentation and the import license;

- Kosovo* has closed its market for Serbian goods of animal origin which can be found only in traces. The consequence is that the market of Kosovo* has been given away to exporters from Slovenia, FYR of Macedonia and Montenegro. The market imposes as mandatory to obtain the Halal certificate, which makes the export more expensive but does enable a bigger market.
- The voluminous export documentation comprises: invoice in RSD without VAT, issued in the Serbian language, producer's specification, proof of origin of cattle, Unified Customs Document, CRM and certificate of quality of goods. The main problem with the placement of processed meat to the market of Kosovo* is the lack of a valid and harmonized veterinary certificate.

Companies are fully ready for placements to the Kosovo* market having in mind the high quality of products, health and safety requirements, business operations pursuant to HACCP principle and respect for international quality standards ISO 9001, IFS and Global Gap. As regards exports to the EU market or to other countries signatories of the CEFTA Agreement (such as FYR of Macedonia) have not difficulties.

In the Processing industry (Field: Food production), identified problems faced by companies from Serbia which produce vegetable oils and animal oils and fat (such as: edible oils, margarine, vegetable fat, mayonnaise and delicacies based on mayonnaise.) refers to:

- Non-harmonized veterinary certificate. According to the representative of importers, if the merchandise is coming from Serbia, the Kosovo* side requests the veterinary certificate for the foreign market and treats the goods like foreign goods. At crossings, veterinary certificates are required although they are not mandatory for products containing less than 51% substance of animal origin (mayonnaise and margarine). Such practice, apart from Kosovo*, exists also in Bosnia and Herzegovina;
- The requested documentation (certificate of origin, certificate of health compliance and the set of laboratory analysis) has to be obtained for each individual export. The Certificate of health compliance is obtained from authorized laboratories, and the rest of documentation is prepared in the company;
- Establishing the origin of the goods. It is necessary to ensure the origin of the goods at the customs terminal for every individual import, which is additionally complicating the procedure. Controls carried out by relevant services are too frequent.

Analyse of the production of dairy products shows that institutions in Serbia consider Kosovo* as an integral part of Serbia and export from Serbia to the territory of the Province is not possible. For the entrance of dairy products to the market of Kosovo* the Veterinary Agency of Kosovo* requests the export certificate issued by the Veterinary Directorate of the Republic of Serbia. However the relevant institutions in Serbia do not issue such licenses because they consider Kosovo* to be part of their territory. The identified problems in this area can be systematized as follows:

- Too expensive analysis of dairy products which have a short shelf life;

- There is no harmonization of the export documentation and certificates accompanying the goods of animal origin are not recognized. There is dispute over the veterinary certificate accompanying the goods;
- The allowed concentration of aflatoxin in Serbia and the countries in the region is not harmonized. Since it is only Serbia which deviates in regulations in regard to the surrounding, it is necessary to harmonize the allowed concentrations of aflatoxin as soon as possible in order to be able to satisfy the needs of customers in the region (since 1 July 2014 the level of aflatoxin in Serbia was reduced by 10 times, from 0.5 to 0.05 micrograms per kg, which is in accordance with EU standards).

The placement of dairy products to the CEFTA market is accompanied with frequent changes in procedures, frequent return of documentation for corrections etc.

In the branch: production of mill products, starches and starch products; companies from the Raska District, which produce mill products and sell them in Kosovo* are facing with the following problems:

- The Kosovo* side requests the goods to have the Kosovo* Certificate of health compliance, although companies own Serbian certificates and the Serbian HACCP;
- In order to run their business in north Kosovo*, companies must register Serbian and Kosovo import company. Thus one and the same company is importing (from the Serbian side) and exporting (from the Kosovo side);
- Due to double registration, there is double payment of taxes and registration of workers;
- The Kosovo* side requests the export certificate for the third country;
- Non-harmonized work of services at the crossings (for instance, if north Kosovo* should be entered on Saturday, the papers must be verified on Friday);
- The CEFTA Agreement is violated due to customs duties are paid for products which had been produced in Serbia;
- Big corruption of services at administrative crossings (monthly costs due to corruption are around 500 euros);
- Political pressures for the realization of public procurements.

Realization of exports in product categories such as: confectionary, candies, chocolates, pastry and flips, faced with declaration problem but it was successfully solved in the previous period due to cooperation with distributors in Kosovo* who obtain the adequate declaration.

Conclusion

The main aim of the research was to analyze possibilities for improving business operations between Serbia and Kosovo* and to harmonize procedures for obtaining certificates and documents accompanying the goods. The results show that there is a positive trend on the Serbian side, considering that export from Serbia to Kosovo is bigger in volume and has more favorable structure. In addition, goods exported from

Serbia have higher level of processing in comparison to the goods imported from Kosovo*. It can be concluded that progress in improving conditions for doing business is evident. This is primarily a result of efforts by relevant institutions to simplify and facilitate export procedures, improved information and communication system, as well as simplified customs procedures.

This means specifically that the company which meets required criteria (bank guarantee, debt free, goods transported in adequately equipped vehicles etc.), is authorized to issue the necessary export documentation. There is no double taxation or paying of excise, and transactions with Kosovo* are treated as payment in foreign currency to other countries. In the first half of 2016, contentious issues related to integrated border management (IBM) were successfully resolved:

- Simplified electronic correspondence between the Customs Administration of Serbia and the Customs of Kosovo* is now realized only through the *EU IMB Facilitation Office*, without the intermediary role of the Ministry of interior affairs of the Republic of Serbia;
- Full implementation of the SEED system started, which enables systematic electronic data exchange between the Customs Administration of the Republic of Serbia and the Kosovo* Customs for all type of goods which are crossing the administrative line;
- After receiving the official confirmation from the European Union that procedures under Mutual Legal Assistance were changed, these cases were further dealt with by the Ministry of Justice of the Republic of Serbia;
- Harmonized certificate of pharmaceutical product (CPP). Relevant institutions in Pristina have issued first decisions on registration to drug producers for releasing circulation medicines in the territory of Kosovo*;
- Since 21 September 2015, the Republic of Serbia has started to issue entrance/exit documents and temporary plates for vehicles "proba" (temporary), with the validity of 60 days and with the possibility of multiple crossing at joint crossing points;
- At the joint crossing point Mutivode customs officers of both sides work seven days a week, from 8:00 a.m. to 8:00 p.m.;
- Veterinary certificates for live animals are harmonized (except in case of breeding cattle) and became operational on 1st March 2016. Harmonization of certificates for dairy products is pending, as well as certificates for meat products;
- The harmonized phyto-sanitary certificate has been successfully implemented at all administrative crossings at which the commercial transport takes place (Rudnica/Jarinje, Merdare and Končulj/Bela Zemlja).

One of the problems that has not been solved is the inadequately determined customs basis for charging duties on construction thermal blocks. Namely, when the custom basis is established pursuant to the transactional value the result is a significant increase in product price and the reduction of the products' competitiveness. Besides, contrary

to regulations and practice within CEFTA and the EU, products which apart from their vegetative ingredients also contain a certain (minimal) percentage of animal ingredients are required to have a veterinary certificate related to mixed products. Such practice is additionally slowing down the process of exchange and increasing the price of the product. There is also the problem with delivery of non-hazardous waste which relates first of all to paper, glass and metal waste. Companies from north Kosovo* cannot trade in Kosovo* unless they are registered with relevant institutions in Pristina, and businesses from north Kosovo* cannot import products from Serbia without having an adequate license issued by Kosovo* institutions. Also, entrepreneurs from north Kosovo*, who are not registered with the competent authorities, can sell their goods only to end customers because they are not in the fiscal system of Kosovo*.

Communication between Serbian and Kosovo* inspection services does not take place directly, but through EULEX as intermediary. In order to achieve further harmonization, meetings of the two sides with EULEX as intermediary are organized in Brussels every three months, while the activities related to harmonization and normalization of relations are further carried out on a monthly basis. However, further progress in the process of harmonization is unpredictable and it can be said that the solution for existing problems depends on the will and success of communication. Relevant authorities do not act in accordance with the government policies. The implementation of unilateral decisions, introduction of tariff and non-tariff barriers, and negative practice inflict great losses to companies. They significantly limit the placement of Serbian products, which have a long tradition and are recognizable in Kosovo. The Kosovo* market has a big potential and tertiary sector is dominant. This can be an opportunity for the Serbian production sector. The problems identified during the research show that the full potential in economic cooperation with Kosovo* is untapped. Considering the volume and structure of exchange of goods between Serbia and Kosovo*, liberalization of trade and harmonization of rule and using the tools for building the intellectual capital (Radenkovic et al, 2014), which regulate the circulation are in the interest of both sides. It is necessary to further increase institutional capacities and efficiency of relevant institutions with the aim to create an environment which will discourage alternative trade channels.

Conflict of interests

The authors declare no conflict of interest.

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APPRAISAL OF THE DAIRY CAPITAL VALUE ON THE TERRITORY OF THE PESTER PLATEAU

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ABSTRACT

The goal of the paper is to do research of adequacy of the discounting method apply of future results for the evaluation of capital value in dairy industry, on an individual case.

Appraisal of the capital value is a complex procedure of researching, studying, analysing and evaluating numerous factors, which have an effect on an enterprise's value. The appraisal of the dairy capital value from the Pester plateau was presented in the paper. Need for assessment was the change of the dairy's ownership structure. The selected value context in evaluating the enterprise value was "a fair value", while there was applied an output approach i.e. the future results discounting method, because it was about an enterprise that continued to operate. Discounting the future expected outputs represents a current value of future expected outputs with a discount rate, which reflects uncertainty resulted by the expected yields.

According to this paper's results, there has been established that the discounting methods of DCF future results can successfully apply in the dairy capital evaluation that continued to operate

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Introduction

The value of an enterprise is determined by property it disposes with, size and quality of realised investments, the achieved level of development, and the achieved business results, positioning on the market, personnel and management. Future developmental plans, the predictable business activity and their results also have an effect on the capital value. That is why the market value of individual parts of the property cannot be the only measure in order to form an enterprise value. Combining more methods that provide different results enables that the proposed value of capital reflects at the same time values obtained from different points of view. Crossing the results obtained by different methods relativizes the inevitable subjectivity of an appraiser to a certain extent.

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Selection of a method that is going to be applied in the capital value appraisal of each particular enterprise depends first of all on the purpose of appraisal. The capital appraisal of a specific enterprise can be done for various purposes, such as: buying/selling of a company, merging of enterprises, entering of an enterprise to the stock market, liquidation of an enterprise, etc.

Enterprises can have different characteristics in terms of business, and an owner's goals vary from one to the other enterprise. It means that not only one method or formula for the evaluation of any enterprise can be used, in any situation and purpose. Therefore the economic science has developed three approaches of evaluation, which can be used in practice: the yield, market and cost approach (Rodić et al., 2010). The selection of an adequate method depends on several factors: the possibility to project further business, size of an enterprise, financial position of an enterprise, etc. The selected methods are more convenient for the appraisal of a specific enterprise - the final result will be closer to the market value of an enterprise.

Materials and methods

The goal of this paper is to research adequacy of the future results discounting, method application for the appraisal of a capital value in dairy industry.

The yield method has found its wide application in evaluating an agricultural enterprise, perennial plantations, milking herd, agricultural equipment, agricultural buildings, agricultural land, etc. (Vukelić 1998, Gogić 1990, Tica 1993, Ivanović et al., 2006, Ivanović 2006, Tica 1993).

The appraisal of a dairy from the Pester Plateau is based on a detailed analysis of financial and management statements, future development plan, anticipated business activities and results that are expected. The appraisal procedure is consisted of two parts: a sum of current values of future cash flows and a residual value³. The selected context of values is the „fair value“.

The basic characteristics, on which the appraisal of capital value is based, are: a value of an enterprise is equal to a current value of future interests that an owner will have; a value cannot be expressed always in only one number and a value is appraised is a specific moment of time – the date of assessment (Leko et al., 1997).

Within the yield approach, there are two methods in the assessment of capital value, and these are: capitalization of the achieved results and discounting of the future results. The yield approach is applied if yields can be projected relatively reliable and if there can be expected their significant differentiation from the existing ones, due to changes in doing business or the expected changes in the environment of an enterprise. Determination of a residual value is done according to a projected cash flow or profit.

3 Residual value is calculated in a way that a current value of the last residual year multiplies with $(1 + \text{growth rate in the residual period})$ and then it divides by the Gordon's factor that is obtained by deducting a growth rate from a discount rate in the residual period.

Finally, the projected yields and residual value are discounted i.e. reduced to a current value in order to set an enterprise's value. The future yields are projected up to the moment in which they reach a stable level.

The method of discounted cash flow (DCF) is the basic method for the assessment of an enterprise's capital value. Together with the capitalization method, it belongs to the yield approach in the appraisal of capital value. Both methods are based on the future projected results of business (net profit or net cash flow).

The essence of this DCF method is to observe an enterprise as a unique mechanism i.e. the system for making a profit (gain), and this ability directly defines this system value. A value of the enterprise (and capital) is directly dependable on the ability of a specific enterprise to fructificate an engaged capital and make a profit.

Difference between the DCF method and the capitalization method comes from important features of the future projected period. The capitalization method is enforceable if an appraised enterprise has reached a stable level of profit and inflow, so some significant changes will not be expected in the future. If some significant changes in a projected period is expected (usually a higher level of profit and net inflow), the DCF method presents more realistic the yield approach in appraisal of the capital value (Leko et al., 1997).

Hence, the method of discounted cash flow (DCF) presumes continuation of the enterprise's business also after the projected period, by the stable rates, which means that a significant part of the enterprise's value is in this remaining i.e. residual period. A value of the enterprise in residual is set in different ways, and the most famous is the Gordon's model.

The DCF method is based on a fact that „the value of an enterprise's capital is equal to a sum of current values of future net inflows that can be realised by owners in an unlimited long period“ (Leko et al., 1997).

In order to apply this assessment method, it is necessary to choose the cash flow definition, project a cash flow in a selected future period, calculate a discount rate, calculate a sum of NCF current values in a projected period, calculate a residual value, set a final value of the enterprise's capital and adjust to a value of non-operating assets and/or the unused business funds.

The capital value, appraised by applying the DCF method, is consisted of two components: sum of the current values of the projected annual NCF and the residual value. A period of the enterprise's economic life, which hasnt been comprised by the projection, is called the residual, and therefore a component of capital value is called the residual value.

There are several ways to calculate the residual value (discounted liquidation value, a method of capital/value multiplier, etc.). The Gordon's model uses to calculate the residual value, by the Regulation on the Method of Determining the Value of Capital:

$$RV = \text{DNCFr} / (\text{DR} - \text{GRr})$$

RV – Residual Value, DNCFr – Discounted Net Cash Flow in Residual Year, DR – Discount Rate, GRr – Growth Rate in Residual.

The NCF of a residual year calculates in a way the NCF from the last year of a project (when stabilization of business achieves) increases for a growth rate in residual. After that, the current value of NCF_t calculates by using a discount factor.

The growth rate in residual means the continuous increase in NCF, from year to year in a residual period, which hasn't been encircled by the projection. Theoretically, the growth rate cannot be the same as the discount rate, since the result would be infinite. By the Regulation on the method of determining capital was determined that an upper limit of the growth rate was 4%.

Results and discussion

A dairy building was made according to the legal provisions valid for these purposes. Location of the existing building is suitable, because there is no similar building in surrounding; a favourable raw material base; power supply is bigger than real and maximum needs of the dairy; a green belt around the building is sufficient for inevitable traffic arteries and parking spaces, as well as the ecological arrangement of a park within the dairy. Terrain on which the dairy is located is characterized by the favourable wind rose.

The dairy doesn't emit a significant quantity of heat, noise, radiation and there is also no unpleasant smells on condition of maintaining the sanitary hygiene and respecting the projected technological process. Monitoring air quality, soil, noise, electromagnetic radiation and heat emission are not necessary to be done, as it is defined by the Study on the impact of the project on environment. Wastewater, with the only possible significant impact on the environment, gathers in three waterproof septic tanks.

The main forces of the enterprise are availability and vicinity of the raw material base from the ecologically clean area, which significantly reduces the costs of transport (Jandrić et al., 2016). The environment provides a great opportunity that the enterprise expands its range of products, and passes from the conventional production to the production of organic products in the near future (Jandrić et al., 2014). A brand has become recognizable in a short time on the local market. The reason for this quick brand recognition is partly the awareness of consumers and greater focus on brands from the ecologically clean areas. On the other hand, the biggest threat the enterprise is exposed to is the enlargement of a dairy sector and numerous competitors. In the coming period of 10-15 years, the manufacturers consider that their firms will increase the volume of production and 75% of the total manufacturers will stay in production, while the rest 25% will leave production (Zarić et al., 2012).

Together with the competitive threat is also present the lack of adequate and educated workforce, as the main defectiveness of the enterprise for the moment. There is especially expressed the financial illiteracy of owners and managers of the enterprise. The fact is that a large number of people worldwide have lost their belongings as a result of insufficient financial literacy. The financial literacy enables the optimal use of the source of finance and decrease in the assets liquidity risk (Zakić et al., 2017).

The appraised value of a building owned by the dairy is 165 987 € or 250 € / m² of useful surface. Surface area of the building in the ground floor is 670 m² (610.35m² of useful surface). The building is located so that it provides unobstructed circulation of traffic. It consists of entireties predicted for milk processing. The building has a road infrastructure, as well as land in its possession. After several disputes with a municipality, land was bought, by a court verdict, at the evaluated market value of 20 €/m². The costs of the dispute are not included in the evaluation of land value.

While investing and building, an owner has mostly used own workforce (family members), and therefore the labour and maintenance costs haven't been registered. For that reason, in the appraisal of the building several appraisal methods had to be combined, in order to get more reliable information. In the value appraisal of built-in material and a cost price of the following documentation, there was used the cost approach, and regarding the price of construction work, the market approach was used. Finally, there was calculated a price per m² of useful surface.

Table 1 – Appraised value of investments

No.	Investment structure	Amount €	% share
1	Building	165,987	49.22
2	Equipment	138,000	40.92
3	Permanent working capital	33,268	9.86
4	Total	337,255	100.00

Source: Calculation of authors

During the procedure of the building value appraisal, every element of the building was evaluated by an expert, and documentation and total area of the rooms were checked. A value of the building construction was determined in accordance to a construction price in the moment of appraisal, and it was further multiplied with a total useful area of the building. Costs of the investment-technical documentation, construction costs, and costs of the building site arrangement and a purchase value of installations were included in price. A pre-calculated value of the building amounted 167 208 €, which was approximate to the appraised value of the building. Regarding that the building was in use only several months in the previous year (probation period), amortization for this period was ignored.

The evaluated value of equipment on the appraisal date was 138 000€. During the procedure of the equipment value appraisal was done the inventory of equipment, which was reflecting real condition of equipment on the day of the appraisal. A qualified appraiser for this kind of equipment was made an insight into the real condition of equipment and was evaluated its functional, technical and economic backwardness by lines and groups.

In the previous year, the dairy was procured through leasing most of the used equipment for processing milk and dairy products by a net amount of 56 689,60 €. The conditions for leasing were: repayment for 5 years, an effective rate of 9.76%, a nominal rate of interest of 6.99% + six-months EURIBOR, and the calculated currency was EUR

(118.23 RSD/1 EUR). A plan of lease repayment was set through the fixed monthly instalments in the amount of 890.80 EUR.

At the moment of the enterprise's capital value appraisal, the remaining leasing liabilities were 40 976.80 € (2016 - 10 689.60; 2017 - 10 689.60; 2018 - 10 689.60; 2019 - 8 908), while the liabilities for interest were 4 911.50 € (2016 - 2 189.16, 2017 - 1 575.68, 2018 - 918.09; 2019 - 228.57).

Table 2 – Structure of financing

No.	Structure	Amount €	% share
1	Equity capital	296.278,20	87.85
2	Borrowed funds	40.976,80	12.15
3	Total	337.255,00	100.00

Source: Calculation of authors

From the moment machines were put into operation, an investor has changed most of the current equipment with the new one, and therefore the new part of the equipment has got a completely new value. Investments that were invested in additional parts of the equipment were mainly entered to the debit of costs, and some weren't even booked. This is the reason why an expert has to be involved in the appraisal of the equipment value. The expert appraised the equipment by the combination of the market and cost approach. For the part of the equipment that was obtained as non-amortized, the cost approach in the value appraisal was applied, while the market approach was used regarding the part of the equipment that was partly amortized.

Necessary working assets, as well as the spontaneous sources, were planned based on the previous experience and expected changes at the level of these assets or sources engagement. The appraised value of working assets was based on a turnover coefficient (Andrić et al., 2005) and was amounted 33 268 €. Before starting to operate, the dairy did segmentation of the purchasing and sale market, and in the previous period, the dairy didn't have a problem with receivables. In production of 3000 litres of milk per day, the working assets were 30 000 €.

The appraised value of the total investment was 337 255 €. Most of it was invested in the building and equipment. The capital market wasn't adjusted to financing of small enterprises by the financial institutions, while the business banks weren't in of tune with their crediting (Jandrić et al., 2015). For that reason, the dairy that was evaluated was mostly depending on the internal financial resources (87.85%), while a part of the equipment (12.15%) was financed by the borrowed funds.

During the production was projected, there was started from the existing data of the dairy. In accordance to the production of 3 370 litres of milk products and their selling prices, an average selling price for 1 litre of milk products was calculated (0.58 €).

According to the enterprise's developmental plan, the production value for the following 5 years was projected. The plan of development was real, because it was about the building of processing capacity 20 000 litres per day. At the moment of the appraisal, the dairy was working with only 16.85% of processing capacity. The reason for a low degree of utilization of the processing capacity was a very young enterprise, which still was training workers.

Table 3 – Income projection (€)

Year of projection	I	II	III	IV	V
Dairy products l/day	3,370	4,380	5,694	7,404	9,625
Year	713,429	927,246	1,205,420	1,567,310	2,037,795

Source: Calculation of authors

Calculation of the direct material costs is related to the costs of raw material and packaging. In order to anticipate these expenses, it is necessary to be familiar with normative by a product, a permitted percentage of loss and a purchasing price of raw material and packaging.

Table 4 – Net cash flow (NCF)

Description		Year				
		I	II	III	IV	V
1.	Net profit	112,792	161,696	230,386	324,115	445,982
2.	Amortization	24,620	24,620	24,620	24,620	24,620
3.	Interests on credit	2,189	1,576	918	229	
4.	Value remainder of investment					264,156
5.	NCF without the project value remainder	139,601	187,892	255,924	348,964	470,602
6.	NCF with the project value remainder	139,601	187,892	255,924	348,964	734,758

Source: Calculation of authors

Raw milk is paid by a percentage of milk fat. Samples show that milk fat in the raw milk range from 3.6%-4.2%. While calculating the raw milk price, there was taken into consideration an upper value of milk fat in order to decrease the risk of unforeseen costs or the increase in redemption prices of milk. A price of 1 litre of raw milk by this calculation was 0.23€. An average price of packaging was 0.083€, and it was calculated according to the structure and quantity of products and their packaging purchase price.

The workforce specification by the qualification structure was done based on appraisal of type, complexity and scope of work that will be done in the dairy. The qualification structure and a number of performers were set according to adopted technological procedures of production and the selected technological equipment i.e. the level of mechanization of production lines and the adopted organization of work.

While calculating the labour and contribution cost, the baseline data was a number of currently employed workers and the amount of their personal incomes and contributions. In the second year of the projection, the increase in personal incomes for 30% and employing

two more workers in production was planned. In the following years of the projection was planning to employ two workers per production and the increase in personal incomes for 20% for every year individually. The contributions were projected in the amount of 60%.

A final projection of a balance sheet for the next five years was achieved by comprising all aggregate amounts of all previously projected positions. The cash flows projection by years was done until the moment of the cash flows stabilization. Selected definition of NCF was “before the debt service repayment”. Incomes and outcomes i.e. the business result was calculated in the projected period with satisfactory certainty.

Table 5 – Discounted Cash Flows

	Nominal value	Discount factor (7%)	DCF
0		1.0000	
1	139,601	0.9346	130,472
2	187,892	0.8734	164,105
3	255,924	0.8163	208,911
4	348,964	0.7629	266,225
5	470,602	0.7130	335,539
6*	264,156	0.7130	188,343
∑ of current values			1,105,252
Yield value of investment= 1.293.595, *Value remainder from the project .			

In accordance with the regulated methodology, the basic DCF value of the enterprise’s capital was determined as a sum of the discounted value of net cash flows in the projected period and the discounted residual value. The discount factors were selected at the end of year, and were established based on a calculated discount rate of 7%. The cash flows were reduced to the current value by using the appropriate discount factors (Gogić, 2014).

The yield value is a parameter that shows the volume of investment. The residual period is the period after the projection, and the residual value is the value of cash flow after the in detailed projection (Rodić et al., 2010).

The residual value was calculated by using the Gordon’s model (cash flow in the last year was increased for an amount of the projected growth rate in residual).

The net cash flow in the last year was 470 602, and increased for the growth rate 472 955. The discount cash flow in the amount of 337 216 was obtained by discounting the net cash flow of residual.

Since the projected growth rate in residual was 0.5%, the calculated residual value was, by using the Gordon’s model:

$$RV = 337\,216 / 0.07 - 0.005 = 5\,187\,938$$

while constructing the NCF a selected definition before the debt service repayment, the enterprise’s capital value determines indirectly. The value of the dairy’s long-term capital is a sum of the current values (1 105 252€) and the residual value (5 187 938 €) i.e. 6 193 190 €.

The equity capital value is equal to the difference between an appraised long-term capital and a found amount of long-term liabilities on the day of the assessment. Thus, the value of the equity long-term capital was 6 252 213 (6 293 190 – 40 977).

Conclusion

The DCF method was applied during the value appraisal of the total long-term capital of the dairy from the Pester Plateau. There started from the fact that the DCF method was presenting the yield approach more realistic, if significant changes in the projected period were expected. A higher profit and net inflow were expected regarding the dairy value that was appraised.

The selected context of value is „the fair value context“. The discount factors were chosen at the end of year, and were established based on the calculated discount rate of 7%. The expected growth rate in residual was 0/5%.

A real cash flow ‘before the debt service repayment’ and the evaluated value of cash flow in the residual period was projected by the applied method. Sums of the current values after 5 years were 1 105 252 € and the residual value 5 187 938 €. The appraised value of the dairy’s equity capital, by using the DCF method, was amounted 6 252 213 € on the day of the appraisal.

According to work results, there was determined that the DCF method can be successfully applied in appraisal of the dairy capital.

Conflict of interests

The authors declare no conflict of interest.

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TAXATION OF FARMERS BY THE INCOME TAX IN SERBIA

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ABSTRACT

The tax system must be in accordance with the requirements and interests of the tax authorities, but also with the goals of taxpayers. Fiscal intervention should reflect the taxpayer's fiscal power as well as certain forms of taxation. In that regard, agricultural production activities are also the subject of taxation as they are conducted by a large number of entities who have different financial positions and conditions of production. The holders of agricultural production activities achieve their goals, and thus the economic interests of the country are fulfilled. The government show through various measurements that agriculture is an important economic sector and encourage its growth and development. As an instrument of their economic policy, the government can also use the taxation system for agriculture. Taxation of agriculture leads to the achievement of the economic and fiscal goals of the country as well as non-taxation goals. Tax policy measures can, therefore, either encourage or discourage agricultural production activities.

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Introduction

Economic resources: capital, human resources and natural resources are elements of the production process. By their scope and optimization of use, they are both the condition and presumption of the wealth of a country. In a sufficiently long period of time, economic resources will still show the effect of limitation. The limitations of the use of economic resources indicate the limited production possibilities of any economy. The economic selection in the condition of limited resources requires their rational allocation (Popov, 2015) due to the fact that resources can be used in alternative ways.

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The limitation of economic resources, and therefore of natural resources, will lead to their different and specific treatment in the competitive market. Namely, their limitation is a significant component of the price. Through the market mechanism, the pricing policy influences the reduction, i.e. the slowdown in the exploitation of natural resources and the policy of their rational use. In this way, the community tries to preserve or limit the use of non-renewable sources of production through the pricing policy.

Natural resources from the aspect of limitation are relatively different. Some resources are less limited in the process of use than others (Ristić, 2001). A group of natural resources consists of land, water, forests, mineral wealth, air and all organic and non-organic things. They are elements of production characterized by the exploitation of the source, because in nature, in the earth's crust there is a limited amount of these resources. When these natural resources are exhausted, human society will have to use all its knowledge and skills to find other sources of satisfying its needs. Land as a natural resource can be exploited in the production of agricultural crops in an unpredictable term. However, land as a natural resource has limited scope and quality. The limitation of the scope and property over the land give a special quality to this resource. If all the land had the same properties and existed in unlimited quantities and of equal quality, nothing could be charged for its use unless it had particular advantages of its position (Samuelson, 1975). Land as a natural resource is of limited size, which means that it cannot be produced or expanded. Hence, land as a production factor has the fixed supply.

Land can sometimes be "increased" by irrigation, utilization of plants, etc. However, over-exploitation of the soil can have negative consequences that are followed by a reduction in fertility and subsequently a fall in yields of crops. This shows that land is basically the input of production with the fixed size and it cannot be expanded. In contrast to supply, demand for land is a category derived from demand for goods produced on that land as a factor of production (Aničić, Simić, 2017). The entities of the production process use land as a natural resource most often in the process of agricultural production activity. The process of agricultural production activity is complex and demanding. This activity is conducted by a large number of entities who have different financial positions and conditions of production. The projected goal is to achieve production and gain the surplus of products and profit (Piketi, 2015).

Agricultural production activities can be organized in the form of an individual agricultural holding or as an agricultural company (Milošević, Kulić, 2011). Individual agriculture is characterized by a small fragmented estate, production for their own purposes and poor organization. The inappropriate organization of individual agriculture results in the fact that, even in favourable conditions, the farmers are not able to secure a higher profit for themselves through the system of favourable prices of agricultural goods.

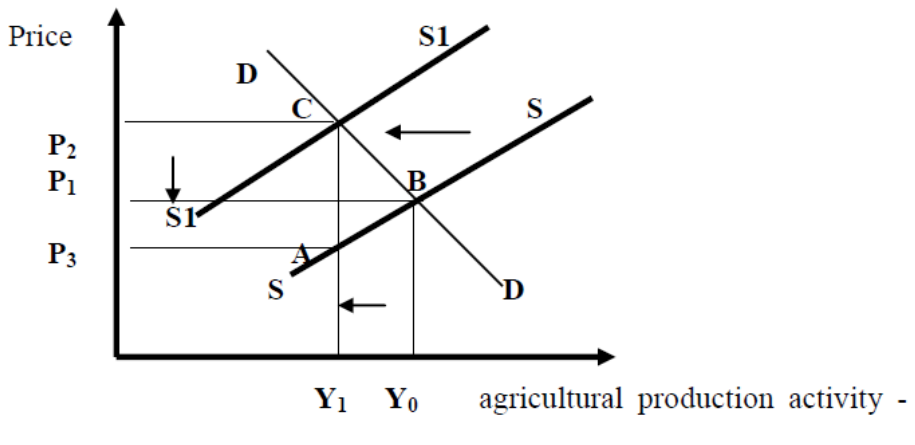
Taxation and market equilibrium of farmers

Through taxation, or subtracting a portion of the taxpayers' payers, the government achieves the fiscal target as well as certain effects on the demand of goods and services on the

market, change in prices, change in production, financial position of the taxpayers, choice of investment decisions, etc. Within the taxation system of agriculture the government must set the boundary of taxation of this production activity. The excessive burden of agriculture can cause economic inefficiency, decline in production volume and collapse of agricultural production activities. Hence the government must establish a sufficiently flexible system of taxation that will lead to achieving fiscal goals (Kulić, 2000) and defending the interest of the entities involved in the agricultural production activity.

We can analyse the taxation system from the point of view of the effects of imposing the tax on agricultural production activity (Y_0). According to the scenario, the following is assumed: the perfect performance of the market; optimal scope of agricultural production activities (balance in point B); additional agricultural production activity means that the cost of producing an additional unit exceeds the benefits.

Figure 1. Taxation in agriculture (Y)



Note: DD – demand curve; SS – supply curve;

Source: Work of authors.

Therefore, the equilibrium is achieved in point B, where the production volume is Y_0 and the price is P_1 . If we introduce a tax (in the AC value) for each unit of activity produced (Y) in the analysis of the agricultural activity, the equilibrium will be established in point C. Namely, the introduction of the tax would lead to an increase in production costs (Y). The increase in production costs caused by the introduction of tax burden (AC) makes agricultural production entities to raise the price of their product from P_1 to P_2 . The price level of P_2 allows the farmer to cover all production costs that include the tax burden (AC) of the given production level. The new P_2 price would move of the supply curve upward into a new equilibrium position S1S1. Since the taxpayers are obliged to settle their tax obligation, they do not, therefore, gain the income determined by the level P_2 , because the tax (AC) is within the market price (P_2) so they will only have the amount of P_3 per unit of production (Y). The equilibrium level of production is also shifted from Y_0 to Y_1 , as the new equilibrium market price is now set at P_2 level.

The tax revenue (Figure 1) is determined by the size of the product, the number of sold product units and the amount of tax (AC). The tax burden is determined in the ABC zone. The effect on farmers due to an increase in prices caused by the introduction of taxes is the decline in production from Y_0 to Y_1 and the potential loss of economic wealth. From the aspect of agricultural activity this can mean that the state of efficient allocation of resources has shifted to the suboptimal position, so the tax authorities while defining the taxation in agriculture must take into account all the effects of taxation of this production activity.

Income tax system and agriculture

The system of agricultural production activity is the subject of the interest of economists, agroeconomists, lawyers, businessmen, and everyone else who conducts scientific research into this sector of economy. Some of them attempt to solve the problems of agricultural production as the bearer of the development of the economy, whereas the others start from the standpoint that agricultural products are essentially intended for human consumption, and thus they are the precondition of people's existence so they analyse the prices of agricultural production, i.e. prices of agricultural products and their impact on consumption of the population and economy. There are also those who try to consider the possibilities of raising the level of income in agriculture through a reduction of costs in business operations.

In this area the government show that agriculture is an important economic sector. The government try to achieve their economic goals through their activities (Stiglitz, 2013), without disturbing the market equilibrium established at the macroeconomic level (Raičević et al., 2016). With their instruments, the government encourage the growth and development of agricultural production activity, but sometimes these instruments, if they are not synchronized with other measures and instruments of economic policy, can negatively affect the flows in the field of agricultural production activity. Fiscal policy as part of the economic policy of a national economy produces the tax goals of the country, but also non-taxation goals (Kovačević, Ilić, Damnjanović, 2017). Hence, tax policy measures can either encourage or discourage agricultural production activity. The importance of the issue of taxation of farmers gets more important when we take into account the fact that the number of members and permanent employees of agricultural holdings of Serbia (according to the data for 2013) totals 1.44 million, out of which even 98 percent are the owners of the farm and members of their households (Cvjetković et al., 2015).

Within the tax system of Serbia, taxation of agriculture distinguishes between agricultural holdings and individual agriculture (Milošević, Kulić, 2011). Agricultural legal entities have the same treatment in the taxation as all other legal entities and they are in the system of corporate income tax. Individual farmers are natural persons, and from the aspect of taxation, it means that they are in the system of personal income tax.

Personal income tax is paid by natural persons, including farmers, who earn income (*Individual Income Tax Law* - hereinafter *IITL*). This is a subjective tax that affects the total revenues of a particular taxpayer (Gnjatović, 1999). Revenue is the sum of taxable income generated in the calendar year. Taxable revenue is the difference between the gross taxable revenue generated by the taxpayer and the costs incurred during its generation and preservation. Income tax is obligatory for the following types of income (*IITL*, article 3): wages and salaries; revenue from self-employment; revenue from copyright, rights related to copyright and industrial property rights; revenue from yield on capital; revenue from real estate; capital gains; and other revenues. These revenues shall be taxable regardless of whether they were received in money or in kind, on the basis of performance or in some other way. A taxpayer is a natural person who is bound to pay taxes. The taxpayer of income tax is a resident of the Republic of Serbia, for income earned in the territory of the Republic of Serbia and in another country. The resident of the Republic of Serbia is any individual whose residence or centre of business and vital interests is in the territory of the Republic of Serbia and who resides in the territory of the Republic of Serbia for 183 or more days, continuously or with breaks, over a period of 12 months beginning or ending in the respective fiscal year (*IITL*, article 7). A taxpayer of personal income tax is also any individual who is not a resident (non-resident) on the revenue earned in the territory of the Republic of Serbia.

Natural persons involved in an agricultural production activity taxed by the personal income tax system are obliged, in accordance with the law, to determine and pay the tax liability for all forms of taxable revenue generated during the calendar year. These are the following forms of revenue: revenue from self-employment, salaries and other forms of income from agriculture as defined by the personal income tax. In accordance with the law, the revenue from agricultural production activities is considered the taxable annual income.

Tax on revenue from self-employment

Revenue from self-employment is the income derived from conducting economic activities, including agriculture and forestry, provision of professional and other intellectual services, and income from other activities, provided that the income is not paid according to the law on a different basis. Taxable revenue from self-employment is taxable profit (Raičević, Radičić, 2008). Taxable profit is determined in the tax balance by adjusting the income of the taxpayer (Popović, 1997) stated in the income statement, which is composed in accordance with the accounting regulations if the entrepreneur is entitled to have double entry bookkeeping, or in accordance with the regulation issued by the Minister in charge of affairs finance if an entrepreneur keeps single-entry bookkeeping. The rate of income tax on self-employment is 10%.

A taxpayer is a natural person who generates income from self-employment if the tax is not paid on the other basis according to the law, and any other natural person (entrepreneur) who is a taxpayer of value added tax in accordance with the law on the value added tax. A taxpayer of income tax on self-employed activities based on income from agriculture

and forestry is a natural person - holder of a family agricultural holding, which kept in the register of agricultural holdings, in accordance with the regulations related to this area (*IITL*, article 32, paragraph 2) and who keeps financial records in accordance with the law (*IITL*, Article 43, paragraph 2). This leads to the two cumulative conditions, which the natural person, who is the holder of the family agricultural holding, must fulfil in order to be registered in the register of agricultural holdings and have the status of entrepreneur. These conditions are as follows: (1) the holder is registered in the register of agricultural holdings and (2) the holder keeps business and financial documents. If the natural person, the holder of the family agricultural holdings, does not fulfil the above-mentioned conditions, they shall not have the status of an entrepreneur (Announcement regarding the taxation of registered agricultural holdings, 2014).

The natural person who receives income from agriculture obtains the status of entrepreneur and has the obligation to keep financial records (The Decision of the Ministry of Finance of the Republic of Serbia, 2013):

- by law – if a natural person is a taxpayer of value added tax in accordance with the Law on the value added tax. According to the Law on value added tax, the farmer whose total turnover of goods and services in the previous 12 months does not exceed the amount of RSD 8,000,000 does not charge the value added tax for the executed turnover of goods and services, has no right to show the value added tax in the accounts and has no right to the deduction of the previous tax and is not obliged to keep the records prescribed by law (*Law on value-added tax* - hereinafter *LVAT*, article 34, paragraph 5).
- at its own discretion - if the holder of an agricultural holding registered in the register of agricultural holdings has decided to have the status of an entrepreneur. This decision is done by submitting a tax return to the competent tax authority (*LVAT*, article 34, paragraph 6, PPDG-1 Form). A farmer may decide to pay value added tax by filing a registration application prescribed in accordance with the law to the competent tax authority, and then they acquire the rights and obligations which the taxpayer of value added tax has by law. In case that the farmer decides to pay value added tax; this obligation will be in effect at least two years. Upon expiry of the obligation, the taxpayer (the farmer) may submit a request for termination of the obligation to pay the value added tax to the competent tax authority.

Therefore, the owners of registered agricultural holdings are taxpayers of personal income tax if they keep financial records and have the status of entrepreneur, or if their annual income of agricultural holdings exceeds RSD 8,000,000 or if they decide to submit a tax return and thus acquire the status of entrepreneur.

The natural person who generates income from agriculture, and does not have the status of entrepreneur, has no obligation to keep business and financial records. This means that a natural person who generates income by performing activities of agriculture and forestry (*IITL*, article 85, paragraph 1, item 14), and a registered agricultural holding that does not have the status of entrepreneur, is not obliged to keep financial records

and is not obliged to pay personal income tax. The above-mentioned category of natural persons is not a taxpayer from the aspect of personal income tax, but is obliged to pay contributions for pension insurance and healthcare insurance in accordance with the law regulating the system of compulsory pension insurance and healthcare insurance, provided that it has an application for insurance on the basis of performing agricultural production activity with the competent fund.

Bearing all this in mind, it is clear that the largest number of farmers in the Republic of Serbia will not be obliged to pay personal income tax (Cvjetković et al., 2015). In this way, starting from the economic environment, the state of agricultural production and the economic strength of the holders of agricultural production activity, the Serbian tax authorities try to encourage small entities of agricultural production activity through the taxation system. However, this decision violates the principle of equality, which means that everyone is bound to pay taxes in accordance with their tax force. Certain subjects of agricultural production are favoured in that way because a significant portion of tax sources remains outside the taxation system.

Adjustment of revenues and expenditures and tax return and tax balance submission

Taxation of income from self-employment requires the determination of taxable income. Taxable income from farmers' self-employment is taxable profit. Taxable profit is determined in the tax balance by adjusting the profit shown in the income statement, prepared in accordance with the accounting regulations if the entrepreneur has double-entry bookkeeping, or in accordance with the regulation issued by the Minister of Finance if the entrepreneur is entitled to single-entry bookkeeping (Milošević, 2013). The entrepreneur (the farmer) keeps the financial records in accordance with the law and is obliged to submit the tax return and the tax balance to the competent tax authority no later than March 15 in the year following the year for which the tax is determined. An entrepreneur, who ceases to perform self-employed activity during the year, is obliged to submit a tax return for the determination of the tax within 30 days from the day of termination. The entrepreneur who keeps the financial records is obliged to state in the tax return the amount of the calculated and paid tax in the tax period up to the day of the interruption or the termination of self-employed activity. They are also required to submit a tax balance along with the tax return (Milojević et al. 2015). An entrepreneur who ceases to have the status of a taxpayer of value added tax in accordance with the law shall also submit the tax return within 15 days from the day of receipt of the decision of the competent tax authority confirming the removal from the VAT registration. Entrepreneur who begin self-employed activity during the year are obliged to submit a tax return in which they will provide an estimate of income and expenses, or an estimate of turnover until the end of the first fiscal year as well as an assessment of the monthly tax advance, i.e. the determination to pay personal income within 15 days from the date of registration in the registry of the competent authority, or from the day of commencement of activity (*IITL*, article 94).

The adjustment of revenues and expenditures, determination of capital gains and losses and tax treatment of losses from previous years are recorded in the tax balance of the entrepreneur in accordance with the relevant provisions of the law on corporate income tax, unless otherwise provided by law. When adjusting the revenues, the taxpayer will have the right for:

- Interest – in the case of a claim from the debtor with the status of a related party or a loan that the taxpayer gives to the debtor with the status of a related party. Persons related to the entrepreneur, in addition to natural and legal persons that have this property according to the relevant provisions of the law on corporate income tax, are also: members of the taxpayer's family; brothers and sisters of taxpayers; parents of the spouse and stepchildren. The interest rate belonging to income in the tax balance cannot be less than the one which would be achieved on the market that it was possible to contract such claims, that is to say, to approve a loan in the accounting period. The difference between market interest rate and accrued interest rate for the between related parties is calculated as taxable profit (*IITL*, article 37, paragraph 2 and 3).
- Outflows taken by an entrepreneur from the business property for private purposes is treated as the business income. The investment of non-monetary assets is estimated at a comparable market value in accordance with the principle of continuity (*IITL*, article 37b, paragraph 1).

When adjusting the expenditures, the taxpayer will have the right for:

- The depreciation of fixed assets that the entrepreneur disclosed in their financial statements in the amount and in the manner determined by the law on the corporate income tax and other related legal acts (*IITL*, article 35a).
- Interest – in the case of a debt to a creditor with the status of a related party or a loan taken by the debtor from a creditor with the status of a related party. The interest recognized as expenses in the tax balance cannot be higher than the one that could be taken as a loan in the accounting period (*IITL*, article 37, paragraph 1).
- Salaries paid by entrepreneurs; costs of business trip up to the amount determined by law; paid contributions for personal compulsory social insurance based on self-employment if the entrepreneur did not decide to get a salary (*IITL*, article 37a).
- The investment of personal assets in business property, apart from investments in fixed assets, has the treatment of the business expense of the entrepreneur (*IITL*, article 37b).
- Tax incentives based on investments in fixed assets in their own registered business and on the basis of investments in accordance with the regulations related to the stimulation of investments in the economy of the Republic. Tax incentives are recognized to entrepreneurs under the conditions and in the manner they are recognized to legal entities under the law on corporate income tax (*IITL*, article 39).

Flat tax rate

The right to flat rate taxation is given to an entrepreneur who, regarding the circumstances, is not able to keep financial reports or this procedure leads to a more difficult performance of their business operations. The entrepreneur (farmer) who earns income by performing independent activities from agriculture and forestry has the status of entrepreneur (registered as an agricultural holding) only if they fulfil two cumulative conditions: (1) they are in the register of agricultural holdings and (2) they keep financial records. Taxation policy clearly indicates that only the natural person may have the status of entrepreneur - the bearer of the family agricultural holding who keeps financial records. The farmers who do not keep financial records will not have the status of entrepreneur so they are not entitled to the flat rate tax. This means that when taxing farmers who generate income from self-employment, the flat rate tax is not applied.

Income tax

An entrepreneur, and thus a natural person being involved in an agricultural production activity in the status of an entrepreneur, who pays the tax on the actual income from self-employment activity may opt for the payment of personal earnings. The entrepreneur who opts for the payment of personal earnings is required to submit a written notice to the competent tax authority about their decision to have the payment of personal earnings. The notice shall be submitted no later than December 15 of the current year for the period starting from January 1 of the following year. The entrepreneur who decides to have personal earnings cannot change the decision during the tax period (Milošević, Kulić, 2015). If the entrepreneur decides to stop paying personal earnings, they will be obliged to submit a written notice to the competent tax authority by December 15 of the current year. In case that the entrepreneur decides to stop paying personal earnings and informs the competent tax authority about this will not be obliged to pay the personal earnings starting from January 1 of the following year (*IITL*, article 33a).

Personal earnings are considered to be the amount of money that the entrepreneur pays and writes down in the financial records as their monthly personal income plus the corresponding payroll obligations. The salary is considered personal earnings of the entrepreneur determined in accordance with the law (*IITL*, article 13, paragraph 3). The personal earnings of entrepreneurs, from the perspective of the taxation, consists of the premiums of all forms of voluntary insurance as well as the pension contribution to the voluntary pension fund which are paid by the employer for employees - insured persons involved in voluntary insurance, or for employees - members of the voluntary pension fund in accordance with the law on voluntary insurance, i.e. voluntary pension funds and pension plans (*IITL*, article 14b, paragraph 1). Exceptionally, the following are not considered the earnings (*IITL*, article 14b, paragraph 2):

- the premium paid by the employer to all employees in the collective insurance against consequences of an accident, including insurance against injuries at work and occupational diseases and collective insurance in case of serious illness and surgical interventions;

- the premium of the voluntary health insurance, or pension contribution to the voluntary pension fund, paid by the employer to employees - insured persons, or members of the voluntary pension fund, in accordance with special regulations related to these areas, up to the amount that has been exempted from payment of contributions in accordance with the law on contributions for compulsory social insurance.

A taxpayer is a natural person who has earnings. The base of the tax on salaries and wages makes up the paid or earned earnings, reduced by the legally determined non-taxable amount. According to the current legal provisions, the amount of reduction is the amount of RSD 11,790 per month for a full-time employee. The income is taxed at a rate of 10%. In the taxation system, tax incentives are provided for entrepreneurs who employ a new person in the form of the right to refund of a part of the paid tax on earnings for a newly employed person. A newly employed person is a person with whom the employer has concluded a contract of employment in accordance with the law on labour relations, and who is registered for the compulsory social insurance at the Central Registry of Compulsory Social Insurance and who, prior to the employment was registered with the National Employment Service for at least six months without interruption, and a person considered a trainee for at least three months. A newly employed person is not a person who was employed by the employer who is a related person to the new employer. The refund of the paid tax is performed in accordance with the law on the tax procedure and the tax administration, within 15 days from the day of submitting the request for return to the competent tax authority.

Taxation of revenues from other sources

In the system of personal income tax, other revenues are considered as: revenues that the taxpayer incurs with the leasing of equipment, means of transport and other movables, gains from gambling, income from insuring other persons, income of athletes and sports experts, and other income, except those that are specially excluded by this Law (*IITL*, Article 81). Other revenues, in the sense of the law, are also other forms of revenues of a natural person, who are not taxable on a different basis in accordance with the income tax. From the aspect of our labour, other forms of revenues of a natural person which are taxed by personal income tax (*IITL*, article 85) are as follows: income from the sale of agricultural and forest products and services, growing and selling mushrooms, bees and snails.

Taxable income gained by a natural person from the sale of agricultural and forest products and services, growing and selling mushrooms, bees and snails, makes up the gross income reduced by a standardized cost of 90% (*IITL*, Article 85, Paragraph 4). A taxpayer is a natural person who achieves these revenues.

Exceptionally, revenues from the sale of agricultural and forest products and services, as well as growing and selling mushrooms, bees and snails gained by natural persons are not taxed: bearers of agricultural holdings who pay the compulsory social insurance contributions according to the decision as the insured persons on the basis of agricultural production activity in accordance with the law on contributions for compulsory social

insurance; beneficiaries of agricultural pensions. (*IITL*, article 85, paragraph 12). The subject exclusion does not apply to the following natural persons: members of the family farm and farmers who are not insured on the basis of agricultural activity, and who have income from the sale of agricultural and forest products and services, as well as growing and selling mushrooms, bees and snails, so they are tax payers in this regard. The rate of tax on other revenues is 20%.

Annual income tax

Annual income tax must be paid according to the decision of the competent tax authority on the income earned in the calendar year in line with the law. The annual income tax is paid by natural persons who in the calendar year earned income above triple amount of the average annual salary per employee paid in the Republic in the year for which the tax is determined, according to the data of the state authority responsible for statistics (*IITL*, article 87, paragraph 1): residents for income earned on the territory of the Republic and in another state; non-residents for income earned on the territory of the Republic.

Income that is subject to taxation is considered an annual sum (*IITL*, article 87, paragraph 2): earnings; taxable income from self-employment; taxable income from copyright and related rights and industrial property rights; taxable income from immovable property; taxable income from leasing movable items; taxable income of athletes and sports professionals; taxable other income; income gained and taxed in another country for residents of the Republic of Serbia. Wages and taxable income are reduced for taxes and contributions for compulsory social insurance paid in the Republic of Serbia at the expense of the person who earned income or taxable income, and taxable income is reduced for the tax paid on such income in the Republic. For entrepreneurs who have chosen personal earnings, earnings are deducted for taxes and contributions for compulsory social insurance paid in the Republic to the burden of the entrepreneur who has chosen to have personal earnings, and the taxable income obtained from a self-employment activity is reduced by the tax paid on such income in Republic. Income taxation is reduced for a tax paid in another country. Income tax is increased by the amount that, in the calendar year for which the annual tax is determined, is payable to the payer on the basis of the return of the compulsory social insurance contribution in accordance with the law on contributions for compulsory social insurance. It means that a natural person who earns income by performing activities of agriculture and forestry as well as registered agricultural holdings which in the calendar year earn income higher than the triple amount of average annual salary per employee paid to the Republic in the year for which the tax is determined, according to the data of the state authority in charge of statistics, is the taxpayer of the annual income tax. The taxpayer of the annual income tax is obliged to file a tax return with the accurate data to the competent tax authority at the expiration of that calendar year and no later than 15 May of the following year.

The basis of the annual income tax is the taxable income, which is the difference between income for taxation and personal deductions (*IITL*, article 88): for the taxpayer it is 40% of the average annual salary per employee paid in the Republic in the year

for which the tax is determined, according to the data of the state authority in charge of statistics; for the dependent family member it is 15% of the average annual salary per employee paid in the Republic in the year for which the tax is determined, according to the data of the state authority in charge of statistics, per member. The total amount of personal deductions cannot exceed 50% of the taxable income. If two or more family members are subject to the annual income tax, deduction for dependent family members can only be made by one taxpayer. Annual income tax is paid for the basis at the following rates (*IITL*, article 89): on the amount up to six times of the average annual salary - 10%; to the amount exceeding six times the average annual salary - 10% on the amount up to six times the average annual salary, plus 15% on the amount over six times the average annual salary.

Conclusion

The fiscal target of the government is not only tax revenues from which they will finance public needs, but also the achievement of certain effects within the national and international economy. If the government violates the optimal allocation of economic resources by the measures of taxation, this may lead to economic inefficiency, distortion of the market equilibrium and the effect of tax resistance in the form of the so-called "evading the tax zone".

The introduction of taxes, i.e. the growth of the tax burden on agriculture, will increase the costs of this activity. The increase in costs caused by the introduction of tax burden leads to a rise in the price level of agricultural products. The new equilibrium price of the supply of agricultural products will further disturb the balance in other markets of goods and services.

The effect of the price increase of agricultural products, caused by the introduction of taxes, is the decline in production, but also the potential loss of economic wealth of farmers. From the aspect of agricultural activity this can mean that the state of efficient allocation of resources has shifted to a suboptimal position and tax authorities while defining the taxation on agriculture must take into account all the effects of taxation of this activity.

Agricultural production activity from the aspect of the Serbian economy is a condition and basis of growth. Hence the government must establish a sufficiently flexible system of taxation that will mean the achievement of fiscal goals, but also the achievement of the interest of the subjects of the agricultural activity. The excessive burden of agriculture can cause economic inefficiency, decline in production volume, collapse of agricultural production activity, etc.

Conflict of interests

The authors declare no conflict of interest.

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ENVIRONMENTAL PROTECTION IN THE LIGHT OF DISCREPANCY BETWEEN THE NORMATIVE AND THE REALITY

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ABSTRACT

The work is a synthesis of three important aspects in the approach to the environment, on the basis of which it is possible to meet its normative definition and understanding of the situation in practice. Given this basis it is possible to separate international, general and criminal legal area of its normative regulation. Each of these aspects is equally important in getting to know the area of the environment in our country. Hence, it is used in expanding the methodological approach which comprises a number of methods (legal, social, statistically, systematically et al.). In addition to the theoretical part of the work an important aspect is the research pertinent to scope and dynamics of criminal acts against the environment in the country. The results are tabulated on the basis of which conclusions are derived as well as suggestions de lege ferenda. Timeframe of the research covers the period 2011-2015. year and is based on information contained in the bulletins RSO. We believe that the five-year period in determining the oscillating trends in the field of criminal law protection of the environment provides sufficient referral. In the final part of the paper, a detailed analysis of material is presented as well as a critical review of the presence of inconsistency between the normative and the real situation in the field of environmental protection.

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Introduction

The environment makes an integral part of everyday life for people worldwide. The proper attitude of the international community, as well as each individual country depends on its level of protection. The legal position of the environment involves a wide range of different levels of regulation. This refers to the applicable international

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legal instruments and national legislation in this area. The fact is that the legal setting has a very jagged system of regulations governing the various aspects of its legal framework. Any attempt to classify them by nature is characterized by two main areas of normative regulation of environmental protection, one of which makes general legal and other criminal justice aspect of protection. Both of these aspects can complement each other and together participate in building a comprehensive legal mechanisms of their regulation. On general level environment is primarily treated as a human right of the third generation. This law was discovered and legally verified in the second half of the last century. Natural and social environment that is conducive to the affirmation of the right to a healthy environment follows the maturing of awareness of the need to provide legal protection from various forms of its pollution. But the initial understanding of the content and framework for environmental protection was based on the current needs of society to stop its pollution. It later evolved with rapid industrialization with the use of so-called dirty technologies. Goods that are produced using modern technology often upset the whole ecosystem, human health and life. Factors that may be affected by environmental pollution include: soil, water, air, flora and fauna that are contained in the lithosphere, pedosphere, hydrosphere, atmosphere, biosphere and technosphere. Because of the particular importance for society, its survival, but also the further development of the system of protection and improvement of the environment is defined as a set of measures and conditions for: preservation and protection of natural and labour created environmental values; protection of people environment from pollution; protection from the influence of damaging and dangerous materials, ionizing and non-ionizing radiation, noise and vibration; protection from destruction and degradation of natural resources, as well as the measures and conditions for the improvement of environmental quality. Each of these factors, together or in conjunction with one or more other factors, may represent objects through which the environment is endangered. In addition to general level of protection it is essential to protect the environment in the area of criminal law. Hence, it is the object of criminal protection of the entire group of criminal offenses. These works are normatively directed toward a clear definition of incriminating zone framed by environment. By adjusting criminal law to these needs legislators have largely used the existing criminal acts frames and entered blanket or referral norms, whose wider purpose lies in the general provisions of the legislation. Ratio legis of such legislation is the fact that criminal law is not able to explicitly include all possible structures, but also all possible damage to the environment at a given time and in a particular area. Therefore, you can not complete the study of all aspects of the environment without reference to the needs and possibilities of its criminal law protection. In this area one can see the presence of clearly expressed discrepancy between the normative and the real situation.

International framework of environment protection

Simultaneously with the first forms of environmental pollution, which exceeded the previously existing sporadic cases, is recorded in organized attempts its normative regulation. One of the important events in this direction is the organization of the United Nations Conference on the Human Environment held in Stockholm in 1972. In the

literature, this conference is seen as a key turning point in the direction of improving environmental protection. The Stockholm Declaration states the alarming state of the environment. It points to the need for further monitoring its quality, utilization of resources, the result of pollution on human health, nature, wildlife. Simultaneously, within the United Nations Environment Program (UNEP) is formed, with the aim of further public awareness rising to the growing danger to the mankind due to disbalance of the eco balance, and especially air pollution, water pollution and rational usage of existing natural resources (Kostadinović Krasić, 2002: 302).

Increased interest, and then legal verification, the right to a healthy environment becomes visible with the adoption of a whole range of international legal instruments. These include several key international documents: the First Additional Protocol on the Protection of Victims of International Armed Conflicts (1977), the Convention on the Prohibition of the Military or any other hostile use of techniques that change the environment (1976), the Convention on the Prohibition or Restriction of the Use of Certain a class of conventional weapons that may be considered to cause excessive traumatic effects and to act without distinction as to the objective (1980) and the Third Protocol on prohibitions and restrictions on the use of combustible weapons. These legal documents belong to the International Humanitarian Law Act, in the area of which it sought to regulate the field of environmental protection in relation to the use of various types of weapons produced by pollution. However, due to the use of weapons in war conflicts, a greater and lesser intensity, it is almost impossible that these funds (do not) have negative effects on the environment.

Although a number of legal documents have been adopted, one of the more important ones for environmental protection, the aforementioned Convention on the Prohibition of the Military or any other hostile use of techniques that change the environment from 1976 (Knežević Predić et al., 2007: 589- 592). Article 1 of the Convention states: "Each State Party to this Convention undertakes not to engage in military or any other hostile use of techniques that modify the environment, which have wide, long-term or severe effects as means of destruction, damage or injury any other Member States" (paragraph 1).

The term "techniques that change the environment" includes any technique for change - through uncontrolled manipulation of natural processes - the dynamic, composition or structure of the Earth including its soil, lithosphere, hydrosphere and atmosphere or the cosmos (Article 2 of the Convention). The text of the Convention prescribes certain restrictions on the possibility of using funds that which can result in environmental pollution. Nevertheless, the Convention does not prohibit the use of modification techniques that do not cause destruction, damage or injury on the part of the enemy (Radivojević, Raičević, 2012: 130). Over the past years, a number of legal instruments have been adopted internationally in order to protect the environment from various forms of its endangering. It is important to point to the international legal documents that our country signed, which became part of our internal law. Of importance for the field of environmental protection, we can highlight the following:

- Decree on the ratification of the International Plant Protection Convention („Službeni list FNRJ“ međunarodni ugovori, br. 7/55);
- Law on Ratification of the International Convention for the Protection of Birds („Službeni list SFRJ“, br. 6/73);
- Decree on the ratification of the Convention on wetlands of international importance, in particular as a habitat for birdworm birds („Službeni list SFRJ“, međunarodni ugovori, br. 9/77);
- Convention on Cooperation for the Protection and Sustainable Use of the Danube River („Službeni list SCG“, međunarodni ugovori, br. 4/03);
- Law on the ratification of the Framework Convention for the Protection and Sustainable Development of the Carpathians („Službeni glasnik RS“, međunarodni ugovori, br. 102/07);
- Convention on combating desertification in countries with severe drought and / or desertification, especially in Africa („Službeni glasnik RS“, međunarodni ugovori, br. 102/07);
- Law on the Confirmation of the Convention on the Conservation of European Wild Fauna and Flora and Natural Habitats („Službeni glasnik RS“, međunarodni ugovori, br. 102/07);
- Law on the Confirmation of the Kyoto Protocol to the United Nations Framework Convention on Climate Change („Službeni glasnik RS“, br. 88/07 и 38/09);
- Law on the Confirmation of the Convention on the Environmental Impact Assessment in a Transboundary Context („Službeni glasnik RS“, međunarodni ugovori, br. 102/07);
- Law on Ratification of the Protocol to the Convention on Long-Range Transboundary Air Pollution on Long-Term Financing of the Co-operation Program for Monitoring and Evaluation of Transboundary Transmission of Air Pollutants in the Long Distance Areas in Europe (EMEP) („Službeni list SFRJ“, međunarodni ugovori, br. 2/87);
- Montreal Protocol on Substances that Deplete the Ozone Layer („Službeni list SFRJ“, međunarodni ugovori, br. 16/90 i „Službeni list Srbije i Crne gore“, Međunarodni ugovori, br. 24/04);
- The Law on the Confirmation of the Convention on the Availability of Information, Public Participation in Decision-Making and the Right to Legal Protection in Environmental Matters – Aarhuska convention („Službeni glasnik RS“, međunarodni ugovori, br. 38/09).

These instruments have universal relevance and represents the basis of the internal environmental protection system in each signatory country. A significant contribution to

the legal regulation of the environment is given by European countries. In an umbrella European legal instrument, such as the European Convention for the Protection of Human Rights and Fundamental Freedoms of 1950, there is no mention of the right to a healthy environment because at the time of its adoption it was not revealed. Also in subsequent Protocols (1-13), the environment was not subject to legal regulation („Službeni list SCG – međunarodni ugovori”, br. 9/2003 и 5/2005).

By analyzing important European legal instruments, we can notice a lack of interest in the legal verification of the right to a healthy environment, until the formation of “The coal and steel community”, or its transformation into the European Union. Hence the affirmation and development of the right to a healthy environment can be recognized in the legal instruments adopted within the European Union. In the Treaty on the European Union of 1992, signed in Maastricht, special attention is paid to the healthy environment. Chapter XIX, called environment, is a cornerstone of its later detailed regulation in specific legal instruments. Thus, the provision of Article 174 (former Article 130r) provides: Union policy in the field of environmental protection contributes to the achievement of the following objectives:

- Conservation, protection and improvement of the quality of the environment;
- Protection of human health;
- Wise and rational use of natural resources;
- Encouraging measures at the international level to deal with regional or global environmental problems, in particular in the fight against climate change (Lopandić, 2003: 146).

In the field of environmental protection, two legal documents of the European Union are of particular importance. These are: the 2000 Lisbon Strategy (revised 2004) and the 2001 European Union Strategy for Sustainable Development (revised 2006). These documents link the environment with economic and social development (Jelinčić, Đurović, 2009: 20). In individual legal documents adopted at the level of the European Union, certain aspects of environmental protection are considered. This includes the protection of: water, air, soil, human and animal health, plant protection, etc. It explicitly does not mention certain goods that come into the sphere of environmental protection, but specific plans and programs to protect it are identified. This is, for example, the case with the EU Directive 2001/42 / EC on the assessment of the impact of plans and programs on the environment. Its goal is to achieve a high level of environmental protection and contribute to the inclusion of factors important for the environment and the process of preparing and adopting plans and programs in order to promote sustainable development. It can be achieved by ensuring the adoption of appropriate plans and programs where there is a potential for significant environmental impact. This is especially important when there is an objective possibility of creating significant environmental impacts (Prlja et al., 2012: 161-162).

In its strategic documents, the European Union has particularly emphasized the need for environmental protection, regardless of the area of human activity. The current European Union's Development Strategy (Europe 2020) defines key objectives in the area of sustainable development. They are dedicated to the efficient use of available resources in a way that protects the environment (Ilić et al., 2017: 45).

Although there is a wide variety of European legal instruments, it is not possible to establish a precise definition of the environment. It could be said that there is as much definition of the environment as the authors dealing with her study. A similar situation is in terms of European regulations regulating the environment. Therefore, the valid legal instruments used by the European Union to improve the position of the environment could be divided into two categories: a) as a set of objective, material standards, relating either to the establishment of a limit on the emission of harmful substances or to the prescribing of concrete standards of product or process quality Production; B) as a set of rules relating to different procedures within the framework of environmental management, such as monitoring procedures for air or water pollution, rules relating to the transparency and accessibility of environmental data (Jelinčić, Đurović, 2009: 22).

Making decisions, while respecting potential environmental consequences, is important at different levels, ranging from strategic to operational work. In addition, the types of decisions in which to consider the environmental impact are in the areas of strategic planning and capital infrastructure investments: the construction of certain industries, green buildings, waste management; Eco-design and product development; Operational management - the introduction of green public procurement (Stevanović Čarapina, 2014: 28). They set up areas in which it is necessary to establish legal mechanisms in countering various forms of environmental degradation. This implies the application of principles and principles that have universal validity. An important step in this direction is the definition and application of the precautionary principle on which all EU regulations must be based (Tubić, 2014: 372).

In the European Union's legal instruments, the right to a healthy environment has never been treated as an essential right, but it is working on its development as procedural and participatory law - through the right to participate and the right to legal redress. The Union views the environment beyond national boundaries, treating it as a regional problem (Kostic, 2009: 220). It is necessary to bear in mind the fact that environmental pollution can not be resolved in the national context, since, in the end, the final outcome of the procedural part of the protection is made by the European Court of Human Rights. Thus, among the various applications that the European Court of Human Rights has acted on, due to non-enforcement of the decisions of the domestic courts of the Contracting States, found an application for non-enforcement of decisions protecting the environment (number 36220/97, judgment of 12 July 2005). With this judgment, the Court emphasized the importance of the environment because it applied a milder criterion when it comes to the applicant's obligation to show a legitimate interest, in this case the applicants directly suffered damage from the operation of the thermal power plants so that the application would be taken into consideration. This case could be an incitement to all those affected by the consequences of pollution by large polluters and want to oppose it (Stopić, Zorić, 2009: 26-29).

General boundaries for environmental protection

The right to a healthy environment is guaranteed by the Constitution of the Republic of Serbia (Article 74), by prescribing that “everyone has the right to a healthy environment and on a timely and complete notification of its state, but also the obligation to preserve and improve the environment” Official Gazette of the Republic of Serbia “, No. 98/06). In the law of the Republic of Serbia, the first law that sought to regulate environmental protection in a comprehensive manner was enacted in 1991. He is brought to model by Sweden, which is a systemic law

He brought it back in 1969. After the adoption of this law, which regulates environmental protection in a general way, certain measures of its protection could be determined by special laws. At the same time, a number of by-laws were adopted to concretize legal norms (Popov, 2013: 139-140).

Access to environmental protection can not be effective without adapting national legal frameworks to European and international legal standards. In this field, Serbia has done a lot of accepting the obligations that bring with it the process of accession to the European Union. At the legal level, the Stabilization and Association Agreement (SAA) is considered a fundamental legal document establishing the basic level of cooperation between our country and the European Union (“Official Gazette of the Republic of Serbia - International Agreements” No. 83/2008). In this document (Article 111), cooperation is established with the aim of strengthening administrative structures and procedures to ensure strategic planning of environmental issues and coordination between relevant decision makers and focuses on harmonization of Serbian legislation with the EU *acquis* (Vasiljević, Đurić, 2012: P. 136).

An important aspect of our country’s total relations with the European Union belongs to the general trend of increased carbon dioxide concentrations in the air. According to the Intergovernmental Panel on Climate Change (IPCC 2007), the increase in average annual air temperature by 2100 will be 6.40 Celsius degrees, with uneven and unpredictable intensity of rainfall and storm (Stankovic et al, 2016: 861). The announcement of such major changes obliges all EU Member States, including those in the accession phase, to adapt their legal solutions to practical needs. This implies markedly dynamic changes in the field of preservation and environmental protection against quite certain climate variations in the future.

The normative regulation of the environment in our country is based on the applicable Law on Environmental Protection (“Official Gazette of RS”, No. 135 / 04-14 / 16). It is a basic legal regulation that is adapted to the needs of our society and the standards that we, through the process of harmonization with the law of the European Union, have to fulfill. This is explicitly emphasized in the clause of Article 1, which stipulates that “this Law regulates an integral environmental protection system that ensures the realization of the human right to life and development in a healthy environment and a balanced relationship of economic development and the environment in the Republic

of Serbia”. An important segment of environmental governance and environment is the conditions and instruments for: a) sustainable management, preservation of the natural balance, integrity, diversity and quality of natural values and conditions for the survival of all living beings; B) prevention, control, reduction and rehabilitation of all forms of pollution of the environment (Article 2). Their specialty is reflected in the fact that they cover different aspects of the environment.

An important part of each law consists of general principles or principles that allow for its inevitable and consistent application. Their content and number are targeted to focus on the specific legislation in general and special legislation. The category of basic principles are: a) the principle of integrity; B) the principle of prevention and precaution; v) the principle of preserving natural values; g) the principle of sustainable development; d) the principle of the liability of the polluter and his legal successor; F) the “polluter pays” principle; e) the “user pays” principle; (G) the principle of subsidiary liability; Z) the principle of implementing incentive measures; I) the principle of information and public participation; j) the principle of the protection of the right to a healthy environment and access to justice. Each of the above principles represents a reliable orientation for bodies participating in a proactive and reactive level of environmental protection. This is also due to the fact that the contents of the provisions in the field of international and national regulations, the subject of which the environment is, are summed up in them.

According to the Law on Environmental Protection, sustainable management of natural values and environmental protection is regulated by special laws and other regulations that regulate: assessment of the impact of plans, programs and projects on the environment; Integrated prevention and control of pollution; nature protection; Protection of air, water, land, forests, geological resources; Chemical management; waste management; Ionizing and non-ionizing radiation; Protection against noise and vibration; Control of a major-accident hazards involving dangerous substances; Cross-border trade and trade in wild species (Article 10). Following this kind of legal solution in our country, a whole range of special laws were adopted, which differentiate the different areas of environmental protection. Based on this, the existing environmental protection system has been completed. However, one should take into account the fact that in a variety of regulations, covering different segments of the environment, there is a lack of the principle of common but different responsibilities.

For example, this would be important in considering our country’s relationship with the current issue of climate change in the world. In this analysis, in the absence of the principles of common but different responsibilities in national legislation, mechanisms should be considered to create the conditions for the consistent observance of obligations arising from international treaties in which our country only has the status of a member (Todic, 2016: 57-58).

Criminal law frameworks for environmental protection

The protection of the environment implies the application of international and national regulations belonging to the so- Environmental legislation. All the more important elements are outlined in them, without which it is unthinkable to regulate the environment. A far more complete way of normative regulation of the environment is not able to fully protect against its violation. To this end, one of the most important issues is to determine the modality of legal responsibility for development and environmental protection. First of all, it is necessary to give a precise answer to the question of who is considered the title of the right to compensation for damage due to environmental damage? The prescribed obligation for the polluter, the environment is protected. But there are also opinions that it can not be a right holder, but it is logical that this is the entity that carries out all this, which is a subject of public law (the Republic, the Province or the local self-government). This concerns the establishment of civil liability for damage to the environment in its totality, including the carers who care about it.

In addition to civil law, the right to a healthy environment also enjoys criminal protection. In this area the past decade can be considered as a decade of major changes in the criminal justice standardization of the environment. Initially treated as a form of human health disorder, which, as a secondary consideration, it always remains, the environment in the Criminal Code of Serbia became a collective protection object ("Official Gazette of the Republic of Serbia", No. 85 / 05-94 / 16). This refers to the situation before the adoption of the new Criminal Code of Serbia in 2005. Then the environment did not have the status of a group protection facility. Criminal acts in which incidents of environmental damage were incriminated were part of a group of criminal offenses against human health. This legal solution in the criminal doctrine has caused dilemmas for decades. The question was whether the environment should be given legal personality in the criminal law (See: Stojanović, 1995: 293-294). The prevailing opinion was that she deserved it, at first by prescribing only certain crimes, and then by her complete independence. One should not ignore the fact that criminal acts against the environment are distinguished by a multidimensional difference (Petrović, 2015: 646).

In the criminal doctrine there are various ways of classification of criminal acts against the environment. In our opinion, the most acceptable division of criminal offenses into four basic groups is that (Čejović, Kulić, 2014: 487-488):

1. General environmental offenses (environmental pollution Article 260 of the Criminal law of Serbia, non-implementation of environmental protection measures Article 261 of the Criminal law of Serbia, illegal construction and putting into operation of facilities and installations that pollute the environment Article 262 of the Criminal law of Serbia, damage to facilities and devices for Environmental protection Article 263 of the Criminal law of Serbia, environmental damage Article 264 of the Criminal law of Serbia, destruction, damage and removal of protected natural goods from abroad Article 265 of the Criminal law of Serbia, violation of the right to information on the state of the environment Article 268 of the Criminal law of Serbia),

2. Criminal acts related to dangerous substances (introduction of hazardous substances into Serbia and unauthorized processing, disposal and storage of hazardous substances Article 266 of the Criminal law of Serbia, unauthorized construction of nuclear installations Article 267 of the Criminal law of Serbia),
3. Crimes against plant and animal life (killing and torture of animals Article 269 of the Criminal law of Serbia, transfer of contagious diseases to animals and plants Article 270 of the Criminal law of Serbia, indefinite provision of veterinary assistance Article 271 Criminal law of Serbia, production of harmful means for the treatment of animals Article 272 Criminal law of Serbia, Contamination of food and water for feeding or feeding of animals Article 273 of the Criminal law of Serbia, destruction of forests Article 274 of the Criminal law of Serbia, forest theft Article 275 Criminal law of Serbia),
4. Hunting and fishing offenses (illegal hunting Article 276 of the Criminal law of Serbia, illegal fishing Article 277 of the Criminal law of Serbia).

Although a comprehensive list of environmental offenses is not final. The legislator has left off criminal offenses that protect the citizens from noise, so that they are still in the domain of misdemeanor law (Stojanović, 2009: 605).

Favoring one or more offenses at the expense of others is legally impermissible. Nevertheless, in the doctrine of the criminal act, pollution of the environment (Article 260) is considered a typical part, so that when considering this group of crimes it always starts from it. The basic form of a criminal offense exists when the offender violates regulations on the protection, conservation and improvement of the environment by polluting air, water or soil in a greater or larger extent. The offense of the criminal offense is consequently determined and consists of a wider catalog of the manner of execution. It is necessary that the actions undertaken result in a criminal offense by violating air, water or land in a greater or larger extent by violating the regulations on protection, preservation and improvement of the environment (paragraph 1). The purpose of this feature is to distinguish this criminal offense from the relevant violations related to the pollution of the human environment (Vučković, 2014: 64). Violation of regulations from secondary legislation regulating the environment, through protection, preservation and promotion, tells us about the accessory role of criminal law in relation to the relevant provisions of administrative legislation (Joksić, 2012: 24-25).

The third and fourth forms exist “if, due to the work referred to in paragraph 1 of this article, destruction of or damage to the animal or plant world of large proportions or environmental pollution has occurred to the extent that the removal of it requires longer time or cost.” The possibility is foreseen for the court to impose a suspended sentence and determine the obligation of the perpetrator to take the prescribed measures of protection, preservation and improvement of the environment within a certain period (paragraph 5).

To the circle of possible executors of this act is belong natural persons and legal entity. However, in practice, legal entities are far more represented due to the fact that they are the most common environmental pollutants. By establishing the criminal liability of legal entities (in 2008) their prosecution has been placed in criminal frameworks. Since a legal entity is managed by a responsible person, it is by their act or omission that the main perpetrator of the offense is polluting the environment.

The strength and effectiveness of legal solutions are recognizable in the field of their application in practice. In order to determine the presence of a particular criminal offense or their group, it is necessary to investigate the scope and dynamics of their execution in a specific time and space. Therefore, we consider a representative number of committed environmental crimes in our country, taking a five-year period. The established spatial and temporal frameworks are considered as reference for determining certain (un) regularities in the execution of these crimes.

Table 1. Review of the number of committed crimes against the environment in the time period 2011 - 2015

Criminal acts against the environment Head (XXIV) f criminal law of Serbia	2011¹	2012²	2013³	2014⁴	2015⁵
Environmental pollution	/	/	2	/	/
Non-implementation of environmental protection measures	4	1	/	/	1
Unlawful construction and commissioning of facilities and installations that pollute the environment	/	/	/	/	/
Damage to facilities and devices for environmental protection	/	/	/	/	1
Environmental damage	3	6	1	3	3
Destruction, damage, taking abroad and entering Serbia's protected natural heritage	2	4	3	4	1
The introduction of hazardous substances into Serbia and the unauthorized processing, disposal and storage of hazardous substances	1	1	1	/	/
Illegal construction of nuclear plants	/	1	/	/	/
Violation of the right to information about the state of the environment	/	/	/	/	/
Killing and abusing animals	27	23	30	25	23
Transmission of infectious diseases in animals and plants	1	1	/	/	1
Unhealthy provision of veterinary assistance	/	/	/	/	/
Production of harmful agents for the treatment of animals	1	/	/	/	/
Pollution of food and water for feeding or feeding of animals	/	/	/	/	/
Devastation of forests	30	36	17	30	34
Forest theft	287	297	407	488	451
Illegal hunting	25	27	14	18	11
Illegal fishing	68	33	33	21	23
Total:	449	430	508	589	549

Criminal acts against the environment Head (XXIV) f criminal law of Serbia	2011¹	2012²	2013³	2014⁴	2015⁵
¹ Official data of the Statistical Office of Serbia, (2012). Newsletter - adult offenders Handsets, prosecutions and convictions, no. 558, Belgrade. 6p. 558, pg 60, Belgrade.					
² Official data of the Statistical Office of Serbia, (2013). Newsletter - adult offenders Handsets, prosecutions and convictions, no. 576, pg. 60, Belgrade.					
³ Official data of the Statistical Office of Serbia, (2014). Newsletter - adult offenders Handsets, prosecutions and convictions (2014), no. 588, pg. 60, Belgrade.					
⁴ Official data of the Statistical Office of Serbia, (2015). Newsletter - adult offenders Handsets, prosecutions and convictions, no. 603, pg. 60, Belgrade.					
⁵ Official data of the Statistical Office of Serbia, (2015). Newsletter - adult offenders Handsets, prosecutions and convictions, no. 617, pg. 66, Belgrade.					

The previous table shows the data obtained from the official records of the Statistical Office of Serbia. A five-year period (2011-2015) was taken as a benchmark indicating numerical data of a group of criminal offenses against the environment. Analyzing the obtained data, we can determine the true absence of “interest” among the perpetrators, and partly of the state authorities, in relation to certain criminal acts against the environment. This is primarily a criminal case for environmental pollution whose dark figure is particularly pronounced. In our opinion, this offense is more often done in practice than in the case of official statistics. The fact that sometimes large polluters do not work with the same intensity or extent affect the lesser presence of environmental pollution that had an epidemic situation in the previous period. However, one should not overlook the fact that pollution has not been reduced to that extent, as it makes a slight impression on the public. Previously, the town of Šabac and Pančevo was the predominant area, but other areas were not spared. In them, the number of plant and animal species was decimated by the disproportionate attitude of certain economic entities who injected unfiltered substances into liquid and gaseous state.

If we were to analyze the share of individual crimes in relation to their total number, then it is undoubtedly the criminal act of forest theft. This crime constantly shows an extremely large number in each of the years worked. Given that it is a type of theft, which has specific features, a large number of execution is proportional to the general trend of criminal offenses against property. They participate with a full-scale number in relation to the total number of crimes committed in our country. After this crime, are committing the crimes committed by the devastation of forests, illegal hunting and illegal fishing. Here we can notice a greater oscillation in 2011, when the number of illegal offenses committed was in a large disproportion in relation to all subsequent years. In the rest, we can surely see a large number of crimes listed.

Animal killing and abuse is a significant number of executions resulting from the general state of affairs in society. This implies a general trend of increasing violence among young people, the absence of empathy, the manifestation of sadistic lines of personality in the form of causing harm to animals and others. It is important to emphasize the lack of readiness to report cases of bad relations with animals due to the rooted perception that they are the property of their owners. Hence, for this criminal offense, there is a very

pronounced disagreement between the number of crimes actually committed and those who received the judicial epilogue. In addition, the literature points to the vague motive of this incrimination, that is, whether it is a matter of inhuman treatment of animals or is a matter of protection because of their value for people and the environment. It is therefore difficult to specify the legal content of this criminal offense (Lazarević, 2011: 827-828).

In the end, it should not be easy to go beyond the fact that certain environmental offenses are not represented in practice or there are no data on their performance. These are criminal offenses: unlawful construction and putting into operation of facilities and plants that pollute the environment, unsafe provision of veterinary assistance and contamination of food and water for feeding or feeding of animals. The reasons for this state of affairs should be found in the fact that these incriminations are closely focused on precisely defined practices that produce negative effects on the environment.

Their dispositions are widely set (so-called standard rubber), which is not the case with other crimes from this group. Hence, in practice they often overlap with other crimes, such as environmental pollution, killing and abuse of animals, etc. In practice, the prosecution authorities should take more account of this because the similar behavior of the perpetrators does not always mean the same criminal offense.

Conclusion

The right to a healthy environment belongs to the third generation human rights. His discovery and legal verification, within the framework of international instruments, relates to the second half of the 20th century. Since then, we have been recording the process of gradual harmonization of national legislation with international and regional legal instruments. The particularity of this right was reflected in inaccessible frameworks, and therefore the possibilities for its protection. Therefore, we have a situation that certain aspects of environmental protection remain inadequately legally regulated. A clear example confirming this is the protection against noise, which in itself is not a human right, but it is enshrined in the right to a healthy environment as recognized by human right. In this sense, incomplete legal regulation of the environment produces certain disagreements between established normative solutions and their application.

The evolution of the right to a healthy environment can be traced back to the early seventies of the 20th century. An important date in this direction is the Stockholm Conference of 1972, when the need and importance of preserving the environment was narrated. On that occasion, the principle is laid down by which each person has the basic right to freedom, equality and adequate living conditions, in the midst of the quality of which enables life in dignity and well-being and a solemn obligation to stretch and improve this environment for present and future generations.

After this conference, the adoption of a large number of international and European legal instruments was followed, of which the largest number was ratified at the time of the former Yugoslavia. They contain broader legal frameworks in which national environmental regulations should be in place.

Legal regulation of the environment in most countries in the world is reflected in the sphere of general and criminal legislation. This practically means that the general legal regulations (eg the Law on Environmental Protection) regulate all significant environmental issues. It implies its conceptual determination, the determination of the circle of subjects and their competences, the measures and conditions for environmental protection, the procedure for determining liability for endangering, etc. This kind of normative regulation of the environment is often proved to be insufficient in practice, so it is necessary to use mechanisms of criminal repression. It is about the incriminations for which environmental degradation is qualified as a criminal offense, which entails establishing the criminal responsibility of its perpetrators. In this part, it is of particular importance to introduce the criminal liability of legal persons, thus tracing the way to their prosecution. This is the case with those subjects whose activity, in itself, produces adverse effects on the environment. The study of the volume and dynamics of criminal acts against the environment shows the variable representation of certain criminal offenses of this group. It is necessary to look for the reasons in the present dark number of certain crimes, although it is known that they are almost daily carried out. Especially interesting is the environmental crime (Article 260 of the Criminal law of Serbia), which is not sufficiently represented in the total number of environmental offenses.

Conflict of interests

The authors declare no conflict of interest.

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EU TRADEMARKS FOR WINE WHICH CONTAINS INDICATIONS OF GEOGRAPHICAL ORIGIN

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ABSTRACT

Trademarks and indications of geographical origin have different legal nature. Main difference is that trademarks indicate origin of goods from specific business entity and indications of geographical origin refers to geographical origin of goods. In an effort to find suitable forms of labelling their product, manufacturers are also using indications of geographical origin. In other words, beside the difference that exists between trademarks and indications of geographical origin, in practice there are cases when indications of geographical origin is used as subject of submitted or registered trademark. Registration practice of indications of geographical origin as trademarks is very restrictive today and it is allowed only under special conditions. In this work we will analyze connection between indications of geographical origin for wines related to the EU trademark in the light of the current EU regulations and most recent practice of the Court of Justice of the European Union.

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Introduction

Indications of geographical origin protected in the European Union might represent interference for registration, grounds for complaint and suspension of the EU trademark. On the other hand, the EU trademark can be registered for numerous products and services. When marking wine, alcohol beverages, agricultural and food products, specific European regulations regarded these products must be considered. These regulations have also direct effect on trademark right (Loschelder, 2015). Probability that the EU trademark is in collision with indications of geographical origin is much higher than expected. In the EU trademark register more than 40.000 trademarks are entered into the class 33 of the Nice Agreement (alcohol beverages, except beer). Of that number, nearly 9.000 are trademarks which for subject of its protection has sign containing term wine. Electronic register of protected designations of origin and protected geographical indications for wine (E-Bacchus) contains about 3.300 registrations, which are in mutual effect with the trademarks of the Union.

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Geographical terms cannot be registered as trademarks upon three grounds: non distinctivity of the mark, i.e. lack of differentiation power, need that mark stay free in traffic and provoking misbeliefs about geographical origin of the product. Also, the question of registration indications of geographical origin as trademarks may be considered in two different situations. The first one is considering registration of geographical terms as trademarks for products that are not originate from mentioned geographical area, while in another situation we have registration of geographical terms as trademarks for products that are originated from that geographical area. Besides that national and supranational regulations predicts absolute disturbances for registration of geographical indications as trademark, in practice there are frequent cases in which same geographical indication is used as subject of two different and competitive rights: trademark right and right to a geographical indication. Practical problems arise due to incompliance of the circle of authorized persons on the older and younger sign. The controversial question that arises in this case is actually the question of the scope of rights that rights owners can emphasize, both in mutual relations and also toward third party. Therefore the need to formulate collision solution in national and supranational regulations.

Indications of geographical origin represent a kind of national resource. As an integral part of intellectual property rights they could become the main promoters of the Serbian economy and the country's expression of identity because the notion of quality of products is directly transmitted to the country's reputation (Jovičević-Simin, Jovičević, Novaković, 2016). Owing to the natural, ecological and environmental characteristics, different rural areas are a very interesting and promising for the development of rural tourism (Vuković, Cecić, Cvijanović, 2007). Wine tourism is an important channel for attracting tourists and developing rural areas (Sekulić, Mandarić, Milovanović, 2016). Yet, wine tourism in Serbia is not quite recognized as a priority although it can generate numerous benefits for the tourism, economy and society in general (Jojić-Novaković, Cvijanović, 2017). Serbia has the potential for the development of wine tourism (Vujko, Gajić, Gudurić, 2017). Geographical indications allow consumers outside our country to recognize the wines from Serbia. Considering the intention of Serbia to join the EU and the WTO (The World Trade Organisation), the experiences of the Old and the New World are precious. An important step towards this goal is the Stabilization and Association Agreement of the EU, by which signing Serbia, among other things, undertook commitment to ensure the level of protection of intellectual property rights similar to the existing protection in the EU, including effective means for exercising these rights. In the following sentences we will analyze specific European regulations considering connections between the EU trademarks for wine and indications of geographical origin.

The most important changes in Regulation 2015/2424

One of the most notable changes in Regulation 2015/2424 and related to the subject of this work is included in the Article 7, paragraph 1 (j) of Regulation. This Article is now modified as norm which imply at specific European right considering protection of the indications of geographical origin for all products. Reference to the EU law,

but also at national law and international agreements, were not foreseen in the text itself of the previous Regulation. Because of that, it was unclear if other EU regulations can even be applied, considering that the European Union Intellectual Property Office in principle decides based on the Regulation 2015/2424, and not other regulations. The link between Regulation 207/2009 (now Regulation 2015/2424) and Regulation 1308/2013 on the establishing joint organization of the agricultural products market was subject of decision of the Court of First Instance in the case CUVÉE PALOMAR (Case T-237/08). In the following text factual situation of this case will be presented.

On 27 November 2006 the applicant filed a Community trade mark application at the Office for Harmonisation in the Internal Market, pursuant to Regulation No 40/94. The trade mark for which registration was sought is the word sign CUVÉE PALOMAR. The examiner, taking the view that the mark applied for was inadmissible on the basis of the absolute ground for refusal referred to in Article 7(1)(j) of Regulation No 40/94, refused the application for registration by decision of 5 June 2007. The applicant appealed against the examiner's decision. By decision of 2 April 2008 the First Board of Appeal dismissed the appeal and ordered the applicant to pay the costs incurred relating to the procedure. The Board of Appeal points out that it is apparent from a comparison of Article 22(3) and Article 23(2) of the TRIPS Agreement (The Agreement on Trade-Related Aspects of Intellectual Property Rights) that the latter provision, the wording of which was incorporated into Article 7(1)(j) of Regulation No 40/94, constitutes a *lex specialis*, which lays down a specific prohibition on registration of geographical indications identifying wines and spirits. That prohibition is, according to the Board of Appeal, absolute and unconditional, since it is not subject to the condition that the use of the geographical indication in the mark for those goods be such as to deceive the public on the actual place of origin, a condition to which application of the general prohibition on registration of geographical indications referred to in Article 22(3) of the TRIPS Agreement is explicitly subject. The Board of Appeal states, in essence, that el Palomar is the name of a local administrative area in the sub-region Clariano and constitutes, pursuant to the applicable Community and national law, an area of production protected by the registered designation of origin "Valencia". Given that the protection of registered designations of origin extends to the names of local administrative areas, in the present case el Palomar, and to words which may on account of their similarity create confusion, as is the case with the word "Palomar" included in the mark applied for, the Board of Appeal states that the presence of that word in the Community mark applied for is understood, pursuant to the applicable legislation, as a geographical indication identifying a wine. The Court finally decided: dismisses the action.

Link between Regulation 207/2009, relating trademark for wine containing geographical indication and Article 92 (ff) of Regulation 1308/2013 is TRIPS. On this basis the European Union has published rules in two directions. For trademarks which refers to wine, harmonization was done in Art. 7, paragraph 1(j) of Regulation 207/2009, which relies on Art. 23, paragraph 2 of the TRIPS. According to this regulation, registration of wine trademark which consist of geographical indication, will be denied or cancelled

if that trademark doesn't indicate to a true origin of the wine. Conditions and the scope of protection of the indications of geographical origin are stipulated in Section 2, Art. 92 (and further) of Regulation 1308/2013. These regulations are aligned with Art. 23 and 24 of the TRIPS. These complicated connection, which the Court of First Instance had to done among Regulation 207/2009 and Regulation 1308/2013, by entry into force of Regulation 2015/2424 is set up on dogmatic grounds. Before changes were done, Article 7, paragraph 1 (j) of Regulation 207/2009 contained rule which was only partly coincidence with Article 102, paragraph 1 of Regulation 1308/2013. This led to numerous dilemmas during its application. Modification in Regulation 2015/2424 lead to simplifying law enforcement, considering that now only appropriate rules of Regulation 1308/2013 are enforced. These rules will be analyzed in the following sentences. Other changes are included in the Article 7, paragraph 1 (k) of Regulation 2015/2424, and gives the answer to the question what is the role of traditional terms for wine. This Regulation in Article 8, paragraph 4 (a) strictly predicts possibility of submitting objection against Union trademark which consist of geographical indication. Besides that, in Article 53, paragraph 1 (d) reasons for relative nullity are prescribed.

Indications of geographical origin as absolute disturbances for registration Union trademark

According to Ar. 7, paragraph 1 (j) of Regulation 2015/2424, trademarks which are excluded from registration, pursuant to Union legislation or national law or to international agreements to which the Union or the Member State concerned is party, providing for protection of designations of origin and geographical indications. Referring to national law, the Court of Justice of the European Union has already confirmed in its practice (Ströbele, Hacker, 2015). It is significant that referring to EU law, first of all to Art. 92(ff) of Regulation 1308/2013. Besides that, referring to international agreements is important. Process of registration indications of geographical origin is regulated in the Articles 93-101 of Regulation 1308/2013. This is the central form on which Regulation 2015/2424 at Article 7, paragraph 1 (j) are pointing out.

Definition of designations of origin and geographical indications according to Regulation 1308/2013

Regulation 1308/2013 contains in Article 93 definition of indications, which are also included in Article 7, paragraph 1 (j) of Regulation 2015/2424. Definition of indications of geographical origin in Regulation 1308/2013 is referred only to wine, and not to other products, such as alcohol beverages, agricultural and food products. Based on it, this Regulation, among other things, is different from other similar regulations. Before Regulation 2015/2424 come into force, it was unclear does the definition of indications of geographical origin from Article 93 of Regulation 1308/2013, has a definite character for the application of Article 7, paragraph 1 (j) of Regulation 207/2009. This dilemma was solved after Regulation 2015/2424 came into force. This question was also a matter of decision of the Court of First Instance in the case "LEMBERGERLAND" (Case

T-55/14). In the following text factual situation of this case will be shortly presented. On 22 August 2012, the applicant filed an application for registration of a Community trade mark at the Office for Harmonisation in the Internal Market. The mark in respect of which registration was sought is the word sign “LEMBERGERLAND”. By decision of 30 January 2013, the examiner rejected the application for registration of the goods indicated in paragraph 3 above, on the ground that the mark applied for was covered by the absolute ground for refusal referred to in Article 7(1)(j) of Regulation No 207/2009. On 25 March 2013 the applicant lodged an appeal with Office for Harmonisation in the Internal Market (OHIM), pursuant to Articles 58 to 64 of Regulation No 207/2009, against the examiner’s decision. By decision of 14 November 2013, the First Board of Appeal of OHIM dismissed the action. It found that the mark applied for contained the geographical indication Lemberg, protected in the European Union for wines originating from South Africa under Article 8(b)(ii) of the Agreement between the European Community and the Republic of South Africa on trade in wine, read in conjunction with Annex II to that Agreement, whilst the wine subject of the mark applied for did not originate from that place of provenance. It took the view that the mark applied for was not simply a new fanciful word in relation to the geographical indication Lemberg and that, in order to justify the refusal of its registration on the ground referred to in Article 7(1) (j) of Regulation No 207/2009, it sufficed that it contained or consisted of elements which enabled that geographical indication to be identified with certainty.

The Court in the verdict (Case T-55/14) confirmed that terms from annex of a bilateral agreement are to be understood as geographical indications in the sense of Art. 7, paragraph 1 (j) of Regulation 207/2009. From this we may conclude that definition of indications of geographical origin from Regulation 1308/2013 is not final. The Court has even stated that definition from the Regulation is irrelevant for indications of geographical origin originated in a third country. Only adequate bilateral agreement is relevant. This verdict has confirmed link between bilateral agreement and Regulation 1308/2013. Definition in Art 93 of Regulation points to geographical indications from a third countries, which also can be protected according to provision of this Regulation. The Agreement between the EU and South Africa, on the other hand, refers to definition of geographical indications from TRIPS, which is without further ground of the 1Regulation 1308/2013, Regulation 207/2009 and Regulation 2105/2424.

Link between trademarks and indications of geographical origin

Link between trademarks and indications of geographical origin is regulated in Regulation 1308/2013, Art. 102, paragraph 1 which reads: “The registration of a trade mark that contains or consists of a protected designation of origin or a geographical indication which does not comply with the product specification concerned or the use of which falls under Article 103(2), and that relates to a product falling under one of the categories listed in Part II of Annex VII shall be: (a) refused if the application for registration of the trade mark is submitted after the date of submission of the application for protection of the designation of origin or geographical indication to the Commission and the designation of origin or geographical indication is subsequently protected; or (b) invalidated”.

The trademark application is rejected, or the registered trademark is declared invalid if the trademark consists of or contains a protected geographical indication. The European Union Intellectual Property Office (EUIPO) has abolished refusal of registration trademark MICHEL LEON for wine, because indications of geographical origin “Tierra de León” and “Castilla y León” are not included in trademark (Klein, 2016). In their decision the Council has stated that application of Art. 7, paragraph 1(j) of Regulation 207/2009 is considered only if submitted trademark contains indication of geographical origin completely. Both indications of geographical origin contains geographical term “León”, which has power of marking. This is a town in the northwest Spain. Other constituent, “Tierra de” and “Castilla” have descriptive character, i.e. have small straight of marking. These descriptive marks are entered in the database E-Bacchus with León as constituent part, as a result, elements of descriptive character have distinctive power in the entire mark. Because of that, participants in the trade can not associate reported trademark with protected geographical indication. On contrary, in the opinion of the Council, participants in the trade associate reported trademark with personal name. For this reason, trademark does not affect the main function of the indication of geographical origin, and that is indication of the region from which the wine originates.

Similar EUIPO has made, in decision “HACIENDA ZORITA DUERO VALLEY” (Klein, 2016). Reported trademark consisted only part of the protected indications of geographical origin “Ribera del Duero” (meaning riverbank of the Duero in Spanish). Most of the elements consisting the trademark have descriptive character, because of that Art. 7, paragraph 1(j) of Regulation 207/2009 could not be applied. For appliance of this regulative, in this very case, trademark must contains protected indications of geographical origin entirely. Following cumulative condition for not allowing trademark registration, apropos extinguishing already registered trademark in the context of Art 102, paragraph 1 of Regulation 1308/2013, is that reported trademark is incompatible with product specification to which protected indication of geographical origin is related. This means that every participants in the trade can use protected indication of geographical origin for wine originated from region on which specific indication pointing. Registration of trademark in this case, must be restricted only to wines in relation to other products from class 33. Under this condition registration of trademark matches product specification to which protected indication of geographical origin is related to. Regulation 1308/2013 in Art. 102, paragraph 1, prescribe alternative conditions under which registration of trademark is denied, i.e. registered trademark extinguishes. The condition is that application of trademark is in line with some factual state mentioned in Annex VII part II of Regulation. In the text that follows factual states from Art. 103, paragraph 2 of Regulation 1308/2013 will be analyzed.

Protection against every direct or indirect commercial use of protected name

On this form of violation of protected indication of geographical origin the Court of Justice of the European Union had opportunity to declare in the case “BNIC COGNAC” (Case C-4/10). The name “*Cognac*” enjoys protection based on Regulation 110/2008 for

brandy made of white grape, originated from French region of the same name.²Dispute about name “Cognac” emerged between French association “*Bureau national interprofessionnel du Cognac*” (BNIC), which presents cognac manufacturers and Gust. Finnish law association, which on 19 December 2000 submitted to Finnish National Board of Patents and Registration request for registration of two figurative trademarks. The first trademark is related to a brandy and besides the figurative element it contained also the endorsement “*COGNAC L&P HIENOA KONJAKKIA Lignell&Piispanen Product of France 40 % vol. 500 ml*”. The second trademark was submitted for wine based liqueur, and besides figurative element contained also the endorsement “*KAHVI-KONJAKKI Cafe Cognac Likööri – Likör – Liqueur 21 % VolLignell&Piispanen 500 ml*”. The National Board of Patents and Registration approved registration of both trademark on 31 January 2003. In the meantime, regarding objection which *BNIC* submitted, the Board confirmed validity of the first trademark, and decided to extinguish the second one. Soon after, Board of Appeal rejects the appeal submitted by *BNIC*, and adopt appeal submitted by owner of disputed trademarks, which abolished previous decision on extinguishing the second trademark. That was the motive for *BNIC* to initiate proceedings in front of the Supreme Administrative Court and requests for abolition of Board of Appeal s decision, or, failing which, the referral of the case back to the National Board of Patents and Registration. Meantime, the Court has adjourned the case, which was initiated before it and initiated preliminary decision procedure before the Court of Justice of the European Union by bringing four questions.

In its verdict, the Court taken a stand that controversial trademark, which, among other, contains the term “Cognac”, represent direct use of protected indication of geographical origin. But the Court did not gave the further explanation of the terms direct and indirect. On direct and indirect application of the protected indication of geographical origin, the Court of First Instance, also had a chance to decide in the case *PORT CHARLOTTE* (Case T-659/14). Registration as a mark was sought for the word sign *PORT CHARLOTTE*. The applicant, Instituto dos Vinhos do Douro e do Porto filed an application with OHIM for a declaration that the contested mark was invalid pursuant to Article 53(1)(c), read in conjunction with Article 8(4), Article 53(2)(d), and Article 52(1)(a), read in conjunction with Article 7(1)(c) and (g) of Regulation No 207/2009. In support of its application for a declaration of invalidity, the applicant relied on the appellations of origin “porto” and “port”, which it claimed (a) were protected, in all the Member States, by several provisions of Portuguese law and by Article 118m(2) of Council Regulation (EC) No 491/2009 amending Regulation (EC) No 1234/2007 establishing a common organisation of agricultural markets and on specific provisions for certain agricultural products and (b) were registered and protected under the Lisbon Agreement for the Protection of Appellations of Origin and their International Registration. By decision of 30 April 2013, the Cancellation Division rejected the application for a declaration of invalidity. On 22 May 2013, the

2 The term „Cognac“, regardless protection which exists under the French law, in the EU law enjoys protection since 15 June 1989. See Annex II, Regulation 1576/89.

applicant filed a notice of appeal with OHIM, pursuant to Articles 58 to 64 of Regulation No 207/2009, against the decision of the Cancellation Division. By decision of 8 July 2014 the Fourth Board of Appeal of OHIM dismissed the appeal. In its verdict the Court has stated that in the trademark "PORT CHARLOTTE" there isn't either direct or indirect use of protected names "Port", "Porto" or "Oporto". Under the opinion of the Court, trade will understand mark PORT CHARLOTT as designation for port of female personal name Charlotte, and will not directly associate it with protected names "porto" or "port" or wine from Porto. The trade will, therefore, understand controversial term as it transfers the message that disputable trademark is referred to place on the river bank or along the river. Analyzed verdicts shows that terms "direct" and "indirect" use is still unclear, which makes Art. 103, paragraph 2 of Regulation 1308/2013 difficult to apply. As regards the term comparable products, Art 102, paragraph. 1 of Regulation 1308/2013 (products included in one of the categories mentioned in Annex VII, part II) is used analogously. Indications of geographical origin in the sense of Regulation 1308/2013 is referred only to wines.

Regulation 1308/2013 protects reputation of indications of geographical origin even when disputable mark is used for different sort of product. This form of protection is comparable to protection which enjoys famous trademarks according to Art. 7, paragraph 5 of Regulation 2015/2424 (Engelhardt, 2011). Number of litigation in which courts had opportunity to interpret this condition of protection isn't big. The Court of Justice of the European Union in its verdict BNIC COGNAC only briefly pointed out that exploiting of the reputation must be done in disloyal way. In the case PORT CHARLOTTE the Court of Justice of the European Union didn't see in the disputable trademark, either direct or indirect, use of protected indication of geographical origin. Because of that, there wasn't need to examine reputation of the protected indication. Nevertheless, in the latest verdict "Champagner Sorbet" (Case C-393/16) the Court has opportunity to interpret Art. 103, paragraph 2 (a) of Regulation 1308/2013 (Omsels, 2017). The dispute arisen because German supermarket chain sold frozen product which contained champagne and distributed it under the name "Champagner Sorbet". The Federal Court of Justice of Germany had dilemma is this kind of acting legal or manufacturer and distributor actually exploiting the reputation of the French sparkling wine which has protected indication of geographical origin. In its verdict, the Court proceeded from the fact that use of the name "Champagner Sorbet" to label frozen product which contains champagne can transfer reputation of protected indication "Champagne" to that product, and by this that protected indication arouses the image of quality and prestige, thereby taking advantage of its reputation. At the end, the Court interpreted Art. 103, paragraph 2 (a) of Regulation 1308/2013 in the way that use of protected indication of geographical origin as part of the name under which food is sold and which doesn't comply to specification of that indication, but contains ingredient which complies to mentioned specification, in the meaning of this regulations, if the key characteristic of that food isn't the taste caused in the first place by presence of that ingredient in its composition.

Protection against any misuse, imitation and alluding

On this condition of protection the Court of Justice of the European Union had opportunity to make a statement in the “Gorgonzola/Cambozola” verdict (Case C-87/97). The Court, in the trademark “Cambozola” recognized misuse of the “Gorgonzola” protected indication of geographical origin, having in mind that number of the syllables and the end syllables identical. The opinion of the Court was that the misuse is intensified by the fact that trademark Cambozola is also used for blue, that is, mouldy cheese. The Court had once again the chance to interpret this condition in the verdict “Verlados/Calvados” (Case C-75/15). Calvados is French indication of geographical origin for apple brandy. Verlados is indication for brandy made from apple which is made and sold in Finland. The European Commission had seen the use of the Verlados trademark as misuse of the French indication of geographical origin Calvados. Finnish authorities, on the other hand, accentuated that beverage under the name “Verlados” is local product and that its name directly indicates to the place of production, the village “Verla” and the household “Verla”. After the Social and Health Sector Licensing and Supervisory Authority made a decision on ban product placement of the beverage under the name “Verlados”, the manufacturer submitted lawsuit to the Market Court. This Court stayed the proceedings and referred a few questions to the Court for a preliminary ruling.

In accordance with its previous practice, the Court noted that “the concept of ‘evocation’ covers a situation in which the term used to designate a product incorporates part of a protected designation, so that when the consumer is confronted with the name of the product the image triggered in his mind is that of the product whose designation is protected”. The Court noted that between the names “Verlados” and “Calvados” there is phonetic and visual relationship. The referring court must take into account the fact that they both contain eight letters, the last four of which are identical, and the same number of syllables, and that they share the suffix ‘dos’, which confers on them a certain visual and phonetic similarity. For the purposes of assessing the existence of an ‘evocation’ are important possible informations capable of indicating that the visual and phonetic relationship between the two names is not fortuitous. Namely, the product “Verlados” was originally named “Verla”, the suffix ‘dos’ being added only later, following a significant growth in exports of ‘Calvados’ to Finland between 1990 and 2001. The syllable ‘dos’ has not particular meaning in the Finnish language. Those facts are capable of constituting evidence from which it may be concluded that the phonetic and visual relationship between the names “Verlados” and “Calvados” is not fortuitous. The misuse, imitation or evocation may be even if the true origin of the product is indicated.

Protection against all false or misleading indications as to the provenance, origin, nature or essential qualities of the product, on the inner or outer packaging

European institutions didn’t have a chance to declare about this condition of protection. In theory there is opinion that subject of prohibition isn’t application of registered indication as such, but application of indirect indication, the one which points out to

registered indication. These include indications, based on its type, packaging or similar, participants in the trade makes wrong conclusions about products origin. The scope of the prohibition, thereby, aren't just fraud data about geographical origin, but also fraud data about commercial origin, nature or significant characteristics of the good (Tillman, 1992, Mikorey, 2001). Anyway, condition for protection is that specific data is suitable for making wrong impression about product origin. In other words, it's not the actual fraud that's been searched for, but suitability for fraud. Existence of fraud considered is valued, still, from the view of average informed, careful and reasonable consumer. On this condition of protection the Higher Administrative Court Rhineland-Palatinate had opportunity to declare. The owner of a winery administration used the label "Superior" on the label of one of his wines. In January 2014, the State Investigation Office Rhineland-Palatinate informed him that this term was protected for certain wines from Portugal and Spain and therefore should not be used in Germany. Against this the person concerned went to court - with success. The Higher Administrative Court Rhineland-Palatinate in Koblenz ruled that the owner may also use the term "Superior" for wines from Germany, since it does not violate European law on the protection of traditional concepts in wine law. The traditional term is then only protected in Portuguese and Spanish for wine. Here, the plaintiff uses the word "superior", even if it corresponds in spelling to the term protected in Portuguese and Spanish, but to a German wine in German. Because the label is labelled in German language. The controversial statement is also not wrong or misleading. In particular, it was not to be expected that the term 'superior' would mislead an average consumer and that the wine fulfils the conditions of use for the Spanish or Portuguese 'superior' wines. An identical decision was made by the OVG on the use of the term "ANGEL'S RESERVE" on a fully English-language label. Again, this is not the use of the traditional term "reserve", which is protected in Austria.

Protection against any other practice liable to mislead the consumer as to the true origin of the product

This condition of protection includes all those cases that are not covered by the previous conditions. Considering that previous conditions are widely formulated, practical meaning of this condition is little. Regulation 2015/2424 at Art 8, paragraph 4(a) prescribed conditions under which indication of geographical origin constitute grounds for objection against Union trademark. This possibility was predicted in Art. 8, paragraph 4 of the earlier Regulation 207/2009. Innovation and advantage of the current regulation is that complainant doesn't have to prove use of indication in trade. Within the complaint procedure, only the assumptions from the Art 103, paragraph 2 of Regulation 1308/2013 are examined. This comes from Art. 8, paragraph 4(a (ii)) of Regulation 2015/2424, which prescribes conditions under which ban of the newer indication can be done.

Materials and methods

This work is based at normative and comparative legal method. Large number of judgments made by the Court of Justice and the Court of First Instance has been analyzed, as well as relevant European regulations. The primary hypothesis on which this work is based relates to impediments for protection of geographical indication as trademark in the meaning of the Regulation 1308/2013. Namely, geographical indication because of its descriptive character can not be registered as trademark. Nevertheless, collision between trademarks and geographical indications arises for different reasons. A problem most often occurs when geographical indication is also registered as trademark, with or without additions suitable for distinct them from original mark. A conflict arise also in the case of registration of trademark which is identical or similar to geographical indication from other state, and which is not known as such in the country of registration. In other words, customers from a country of protection experiencing such mark as fantastic designation. Practical problems arises when the circle of authorized persons to older and newer sign does not coincide. The controversial issue that arises in this case is in fact a question of the scope of the rights that both parties can point out in their relations. Even though the topic of this work is actual also for agricultural and food products, as well as alcohol beverages, the work is limited only to the issue of relation between trademarks and indications of geographical origin for wines.

Results

The theme of this work has great practical significance and it is related to the work of the Intellectual Property Office, the Ministry of Agriculture and courts. Considering importance and actuality of the topic in the world, in this work special attention is dedicated to analysis of the connection between trademarks and geographical indications in the meaning of Regulation 1308/2013. After analyzing a large number of foreign judgments and relevant European regulations, these the following results:

- Regulation 1308/2013 contains the definition of geographical indications.
- Direct or indirect application within the meaning of Art. 103, paragraph 2 (i) of Regulation 1308/2013 exists when the trademark contains indication of geographical origin as a whole.
- Comparable products within the meaning of the same regulation are only those that can be introduced under wine products.
- The reputation of a geographical indication can be used by other products. This examination is not carried out ex officio in the registration procedure.
- It is unclear whether the presumptions of a violation in the sense of Art. 103, par. 2 of the Regulation 1308/2013 is limited to wine trademarks.
- International agreements, in particular bilateral trade agreements between EU countries and third countries, are a convenient instrument for resolving cases of collision between trademarks and indications of geographical origin.

Discussions

Analyzed cases show that the European Union can protect certain name as the name of the origin and to ensure that member states respects decisions of the European Commission and the Court of Justice of EU. However, states which aren't members can proceed with use of names protected in Union as the name of origin, with explanation that they considering them as generic, i.e. indications of entire product type. Namely, non-European countries started later production of those products whose names are protected in Europe as the names of origin. Even though production of such products started later than in Europe, this states become world leaders in production. However, the new manufacturers does not respects names of the origin protected in European countries. For example, the Supreme Court of the Brazil in 1974 ruled that name champagne is to be considered generic. Fourteen years later, the law was adopted in Brazil by which names champagne and cognac, as well as their equivalents at the Portuguese language, are marked as generic. France reacted and submitted appeal by Cognac manufacturers Office. In the meantime, Brazil amended controversial law the in 1996, and in that way provided protection to the Cognac name, but translation of this name "conhaque" stayed in free use. States of South America often justifies this kind of act with linguistic and historical reasons. In fact, the Spanish and the Portuguese languages are originated from Latin, as well as languages of the European Union in which names of origin are protected (France, Italy, Spain, Portugal). Production, and specially cultivation of wine, started with colonization of those countries, and colonizers were the Europeans. Colonizers brought with them also the names of those products. According to this theory, there isn't any unconscientiousness on the part of the manufacturers of South America, because in their's countries disputable names always had generic character. The USA has also refers to historical reasons, so they can explain why names that are protected in Europe as names of origin in their country considered generic or semi-generic. Namely, terms such as chianti, burgundy or champagne were at first used by French or Italian immigrants in memory of their country of origin. This practice wasn't disputed by European partners and led to creation of generic terms which have only "spiritual" connection to the original site. Protection from this kind of actions the European Union tried to secure by concluding bilateral agreements with countries of the New World. Good example is agreement on wine trade concluded in 1994 within the EU and Australia. Until this agreement wasn't concluded, Australia has used names of origin protected in Europe as generic names for sorts of vine grape, without linking theirs meaning for specific geographical, climate or technical conditions. Thus, for example, Australian manufacturers produced wine under the name "beaujolais nouveau", which, due to differences in seasons between Australia and Europe, was ready for sale three months earlier than French wine, causing great damage to the French owners of that name of origin. Concluding an agreement with the EU, Australia made a commitment that names protected as names of origin in the EU won't be considered as generic, and in return the Union will provide help in further development of Australian wine growing and acknowledge their names of origin (such

as South Eastern Australia). Following the example of an agreement with Australia, the European Union in 2002 concluded agreement with the Republic of South Africa. Negotiation between the EU and the USA considering mutual protection of the names of origin, have not given significant results so far, and at bilateral level France succeeded to protect the terms cognac, Armagnac and calvados by agreement with the USA, while in return provided protection to American indications of geographical origin bourbon and bourbon whiskey.

Conclusions

Protection of indications of geographical origin is complex legal issue with undoubted economic, as well as political consequences (Büscher, 2008, Knaak, 2006). Indications of geographical origin have great commercial importance. Among other things, it brings up at consumers certain ideas about quality of the good (for example). Because of that the question arose in early stage, question about right of use geographical indication for marking good and services. That is, by its nature geographical indication is collective mark which belongs to all persons from geographical area that it refers to. From this reason it is not suitable for use as individual mark. It is suitable for distinguishing the goods of persons operating in the area concerned from the goods of persons operating in another area. Nevertheless, in efforts to find as suitable forms as possible for labelling theirs products, manufacturers use the geographical indications as well. Considering the previously exposed problems related to the protection of geographical indications, their economic importance, as well as different legal nature of trademarks and geographical indications, in this work we analyzed question of collision between trademarks and indications of geographical origin for wines in the light of the current EU regulations and the practice of the Court of Justice of the European Union.

Conflict of interests

The authors declare no conflict of interest.

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STRENGTHENING INTERNATIONAL COMPETITIVENESS AND INVESTMENT GROWTH AS THE BASIS FOR A NEW MODEL OF SERBIAN ECONOMY DEVELOPMENT

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ABSTRACT

Insufficient export activity and low level of investment in the formation of gross domestic product are a negative feature of the Serbian economy over a longer period of time. The global financial and economic crisis has shown that a sustainable model of economic growth, which was basically based on the growth of domestic consumption and imports and a low share of investments in the structure of the use of GDP, is unsustainable until then. It has become clear that such a model must be replaced by a pro-investment and export-oriented model of economic growth.

Bearing in mind the trends in macroeconomic flows in the Serbian economy, it is clear that the increase in investment and the competitiveness of domestic production imposes itself as one of the most important tasks of economic policy in the future. In this sense, the main goal of this.

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Introduction

Modern economies function in the conditions of the global market, where the success of each player depends on his ability to be competitive, innovative and flexible. In complex competitive relations that govern the world economic scene, small economies, such as the Serbian economy, must build their way to international success in improving the business and competitiveness of their businesses.

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Given that the Serbian economy has been confronted with a number of political and economic problems over the long period due to which the process of transition was delayed, all this, in conjunction with other negative factors, influenced its poor positioning in the international arena. In such circumstances, it is very important to create an incentive economic environment that will lead to the construction of an export-oriented economy, which would make companies easier to find their place in the international market. In this regard, a special emphasis is placed on the analysis of key factors for improving the competitiveness of the Serbian economy, with a special emphasis on the importance of greater participation of exports and investments in the structure of formation of gross domestic product of Serbia.

Methodology

Theoretical elaboration and the goals have influenced the authors of this paper to use descriptive, comparative-historical and analytical-synthetic methodology, whereby an attempt was made to consider and understand the problem. Furthermore, the analysis of the content of the adopted documents and the results of the previous research was used. The basic data sources are represented by statistics of external trade and investments. Materials of the Ministry of Finance of the Republic of Serbia, The World Economic Forum, The World Bank, Statistical Office of the Republic of Serbia and other relevant sources.

Concept and factors of competitiveness of the economy

The competitiveness of an economy represents the degree of success of its positioning within the global market. It is defined as the ability to achieve market success, leading to a highly productive economy and an improved living standard for the entire population. According to the OECD definition, competitiveness is a measure of the country's ability to produce goods and services under the international market test in free and equitable market conditions, while maintaining and increasing the real income of the population in the long run (Competitiveness in International Trade, OECD). Competition, therefore, represents a competition, a rivalry or a competition process aimed at achieving the best results of the country on the world market. In that sense, we can point out that competitiveness is a concept that explains why some countries are developing faster than others.

There are macroeconomic and microeconomic elements of competitiveness. Microeconomics refers to the competitiveness of the company and is reflected in the relative advantage over other enterprises (lower prices, better quality of goods and services, better sales network, better market knowledge, etc.). Microeconomic elements of competitiveness work directly on the productivity of the company. Unlike microeconomic, macroeconomic elements of competitiveness have an indirect impact on enterprises. This impact is achieved through macroeconomic policy (monetary and fiscal policy), social infrastructure and political institutions. At a macro level, national competitiveness or competitiveness of countries is defined as the country's ability to achieve faster economic growth than other countries and to increase social well-

being so that its economic structure changes and effectively adapts to changing market conditions internationally.

In macroeconomic theoretical thought there are two notions of the concept of competitiveness: traditional and modern understanding (Rosić, Đurić, 2008).

Traditionally, competitiveness is understood as a national participation in the world market or world trade. Consequently, this makes competitiveness a game with a zero score, that is, one country can increase or improve its competitiveness, only at the expense of another country. In order to achieve this goal and increase exports, local labor prices are kept at a very low level and devaluation of the national currency is carried out. It is considered that cheap labor and cheap domestic currency make one country more competitive on the world market. However, this understanding of competitiveness is completely contrary to national economic progress and high living standards. Cheap labor only points to a lack of competitiveness and hampers economic development. By devaluation of the national currency, the whole nation pays a pecuniary tax through the sale of its national products and services at low prices, and the purchase of products and services at higher prices on the world market.

Contemporary understanding of the concept of competitiveness implies finding the answer to the question: what is the source, or what is the basis of national prosperity and living standard? The national standard of living is the result of the productivity of the given economy, measured by the value of goods and services produced per unit of total resources available to one economy (human capital, financial capital, natural resources). Therefore, productivity depends on both the value of manufactured national products and services, expressed at market prices, and the efficiency of their production.

If the previous notes are taken into account, then contemporary perception of competitiveness is reduced to productivity. Competitiveness based on productivity is in line with economic development and high living standards of the population, which means adequately paid labor, high capital gains, etc. Productivity, therefore, should be the real goal of every economy, not export by itself. Only the increase in exports of products and services, which can be efficiently produced and marketed, has an effect on increasing national productivity.

This competitiveness is not an isolated phenomenon, but an interdisciplinary phenomenon that links business strategy, macroeconomic policy, legal and regulatory reform, education, competition policy, and a host of other economic, business and social factors to create a unified strategic plan in order to create greater added value (Cvijanović, Mihailović, 2012).

As a relatively complex indicator (expression) of business performance, competitiveness depends on a number of factors. All these factors can be classified into external and internal factors of competitiveness.

External factors of competitiveness are: macroeconomic management (economic policy), infrastructure, legal environment and regulation, public sector and state

administration (administration), education, taxes and contributions, financial system, special measures of support to enterprises. *Internal factors of competitiveness* include: managerial capabilities, human resources, productivity, profitability, innovation, quality, and so on (Ristić et al., 2017.).

At first glance, it is clear that many of the listed factors of competitiveness, and not just external, are under the direct control of governments. Aware of their responsibility for developing competitiveness, the governments of many countries are directly engaged in increasing the competitiveness of the economies of their countries. So, for example, The governments of Austria, Belgium, Canada, Finland, Germany, the Netherlands, New Zealand, Sweden and the United States are exploring the problem of competitiveness, publishing the results of competitiveness analysis of their countries' economies and defining strategies for increasing competitiveness.

Analysis of the competitiveness of the Serbian economy

In the analysis of the competitiveness of the Serbian economy, we rely on one of the most famous competitiveness indexes - the *Global Competitiveness Index (IGC)*, developed by the World Economic Forum. The Global Competitiveness Index is based on Empire research that identified a wide range of parameters that affect the competitiveness of an economy. These parameters include macroeconomic and microeconomic factors as well as institutional development factors. All these parameters together contribute to the competitiveness of the national economy, defined as a set of institutions, factors and policies that determine the level of productivity of the country. Data is graded on a scale of 1 to 7 (1-worst grade, the 7-best estimate), which is also a range of possible values for all subindicators, and for the Global Competitiveness Index itself.

Research based on the Global Competitiveness Index is based on the assumption that competitiveness is a complex phenomenon influenced by many factors. Numerous factors that affect competitiveness are grouped into 12 pillars of competitiveness, which are organized into three groups.

The first group of pillars of competitiveness includes the so- *Basic requirements*. This group includes the following pillars of competitiveness: (1) institutions, (2) infrastructure, (3) macroeconomic stability, and (4) health and primary education. The second group is the so-called. *Factors of increasing efficiency*. This group consists of the following pillars: (5) higher education and training, (6) the efficiency of the commodity market, (7) labor market efficiency, (8) financial market sophistication, (9) technological readiness and (10) market size. The third group consists of the so-called. *Factors of innovation and sophistication*. This group includes columns (11) sophistication of business processes and (12) innovations.

The degree of development of the country, expressed as a gross domestic product per capita, determines the significance of certain groups of columns. For the least developed countries of greatest importance, the first group of columns, i.e. Basic requirements. In the case of medium-developed countries (including Serbia), in addition

to the basic requirements, another group of columns is of great importance. Factors of increasing efficiency. For the most developed countries, the second and third group of competitiveness pillars are of paramount importance. Efficiency Factors and Factors of Innovation and Sophistication.

The Global Competitiveness Index (IGC), which has been in place since 2005, includes macroeconomic and microeconomic elements of competitiveness. As we pointed out earlier, macroeconomic factors of competitiveness act indirectly on the productivity of enterprises, while microeconomic factors act directly on productivity of firms.

The IGC defines two broad areas of macroeconomic competitiveness: (1) macroeconomic policy and (2) social infrastructure and political institutions, as well as three broad areas of microeconomic competitiveness: (1) business vision of the company, (2) quality of the business environment and (3) business development clusters. Thus, this index included factors of productivity and competitiveness enhancement in development processes involving institutions and business associations. Productivity and competitiveness of the country in the final instance are determined by the productivity and competitiveness of enterprises (Bošnjak, 2011).

Based on the annual reports of the World Economic Forum, we can see that Serbia, prior to the first wave of the global financial crisis, gained the IGK value of 3.90 in 2008, and for the next year (2009), IGK noticeably dropped to 3.77. After this period, there was a gradual recovery, in 2013. the IGC would drop again to the level of 2009, while in 2014. it would return to the level of 2008. In 2015. the minimum value of the IGK of 0,01 was realized, and next year (2016) the indicator of this indicator is markedly noticeable.

According to the report of the World Economic Forum on Global Competitiveness for **2017.**, in Serbia the IGK value was **4,14**. Serbia took the **78th** position in the ranking list, which includes 137 countries that entered the SEF analysis that year.

Table 1. The value of IGC for the Republic of Serbia and the countries of the region (2008-2017)

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Albania	3,55	3,72	3,94	4,06	3,91	3,85	3,84	3,93	4,06	4,18
BIH	3,56	3,53	3,70	3,83	3,93	4,02	n.a.	3,71	3,80	3,87
Bulgaria	4,03	4,02	4,13	4,16	4,27	4,31	4,37	4,32	4,44	4,46
Croatia	4,22	4,03	4,04	4,08	4,04	4,13	4,13	4,07	4,15	4,19
Hungary	4,22	4,22	4,33	4,36	4,30	4,25	4,28	4,25	4,20	4,33
BJRM	3,87	3,95	4,02	4,05	4,04	4,14	4,26	4,28	4,23	n.a.
Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Montenegro	4,11	4,16	4,36	4,27	4,14	4,20	4,23	4,20	4,05	4,15
Romania	4,10	4,11	4,16	4,08	4,07	4,13	4,30	4,32	4,30	4,28
Serbia	3,90	3,77	3,84	3,88	3,87	3,77	3,90	3,89	3,97	4,14
Slovenia	4,50	4,55	4,42	4,30	4,34	4,25	4,22	4,28	4,39	4,48

Source: WEF (2008, 2009, 2010, 2011, 2011, 2012, 2013, 2014, 2015, 2016, 2017)

Compared to the previous year, the value of IGC for Serbia increased by 0.17, which dominantly influenced the improvement of Serbia's position for 12 places (Serbia ranks 90th in 2016, and in 2015 it was 94th).

Table 2. The ranking of Serbia and the countries of the region according to the "Global Competitiveness Report"

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Albania	108	96	88	78	89	95	97	93	80	75
BIH	107	109	102	100	88	87	n.a.	111	107	103
Bulgaria	76	76	71	74	62	57	54	54	50	49
Croatia	61	72	77	76	81	75	77	77	74	74
Hungary	62	58	52	48	60	63	60	63	69	60
BJRM	89	84	79	79	80	73	63	60	68	n.a.
Montenegro	65	62	49	60	72	67	67	70	82	77
Romania	68	64	67	77	78	76	59	53	62	68
Serbia	85	93	96	95	95	101	94	94	90	78
Slovenia	42	37	45	57	56	62	70	59	56	48

Source: WEF (2008, 2009, 2010, 2011, 2011, 2012, 2013, 2014, 2015, 2016, 2017)

According to the overall competitiveness measured by the Global Competitiveness Index, Serbia was ranked better than Bosnia and Herzegovina in 2017, which ranks 103th in the SEF ranking list. Of the other countries in the region, Montenegro has improved the value of IGK by 0.1, and it was located just ahead of Serbia in the 77th position (last year it occupied 82nd position), while Croatia, with an increase in IGK value of 0.04, retained the same 74th place on the ranking list as the previous year. Albania was also ahead in the list for five places, which was placed in the 75th position, with an increase in the IGK value of 0.12 points. Among the best placed economies in the region are Romania, which is this year in the 68th place with a deterioration of 6 places, then Hungary, which improved its position by 9 places, with an increase in the value of IGK of 0.13 points and Slovenia, which again improved its position and took 48th place on the SEF list.

Based on data from SEF Report for 2017, we can notice that, except for Romania, all countries in the region recorded an improvement in the value of IGC this year, which on average amounted to about 2% compared to last year's value. At the same time, Serbia recorded an increase of 4.3% of IGCs, which contributed to the reduction of lagging behind the region's average. It should be noted that improving the position on the ranking list is becoming more and more difficult as the economy moves to the upper half of the list, since much better progress is needed to reflect the same on the values of the soft and hard indicators used in calculating the IGC.

Regarding the measurement of Serbia's progress on the basis of the pillars of competitiveness, it can be noted that in 2017 there was an improvement in almost all the pillars of competitiveness SEF follows (only in the case of the "Health and Basic Education" pillar the same IGC value was achieved, as in the previous year). Improving Serbia's position on the SEF list is the result of the current perception of the business world about the country's ability to provide long-term stable economic growth.

Table 3. Value of IGK by competitiveness pillars (2015-2017)

Num.	Pillar of competitiveness	2015	2016	2017
1.	Institutions	3,2	3,3	3,4
2.	Infrastructure	3,9	3,9	4,1
3.	Macroeconomic environment	3,6	4,1	4,6
4.	Health and basic education	5,9	6,0	6,0
5.	Higher education and training	4,3	4,4	4,6
6.	Efficiency of the goods market	3,7	3,8	4,0
7.	Efficiency of the labor market	3,7	3,8	4,0
8.	Development of the financial market	3,2	3,4	3,6
9.	Technological competence	4,5	4,1	4,3
10.	Market size	3,7	3,6	3,7
11.	Sophisticated business	3,1	3,2	3,5
12.	Innovation	2,9	3,0	3,1

Source: WEF (2015, 2016,2017)

Among the pillars of competitiveness in which the index value is highest, the pillar “Macroeconomic environment” is highlighted. In this year, the index rose by 0.5 points in 2017, and the same increase occurred in 2016 compared to the previous year. These increases in the index of the observed pillar of competitiveness are the result of, in particular, successful fiscal consolidation and significantly better results in terms of the deficit of the state budget, the increase of national savings in GDP and the growth of the country’s credit rating. However, despite the apparent progress in 2016 and 2017, the pillar “Macroeconomic environment” is one of the four pillars with the greatest lag in terms of the environment. Within the first four pillars, which together represent a group of basic factors of competitiveness, it is noticeable increase of the index value achieved by the pillar “Infrastructure”. The progress of this pillar is the result of the higher assessments made in the survey on the quality of total infrastructure in the country, roads, port infrastructure, air transport traffic, and the quality of electricity supply.

All the pillars within the group representing factors of increasing efficiency were achieved with enormous progress, with the only increase in the index value at the “Market Size” pillar, somewhat less compared to the rest. The increase in the value of the index in the competitiveness pillars of this group was on average 3.8% in comparison with the previous year. The improvement recorded in these pillars of competitiveness suggests a slightly higher level of satisfaction of surveyed businesspeople compared to previous years. One explanation is that there has been real improvement in each of the pillars observed, but it should be kept in mind that these data represent an estimate obtained from the perception of the current state and as such do not necessarily reflect objective progress. The last two pillars of competitiveness, which according to the SEF methodology are factors of sophistication and innovation in business, have also achieved an increase in the value of the index. The increase in the index at the “Business Sophistication” pillar is also the second largest and contributing to the increase of the aggregate IGK for Serbia right after the pillar “Macroeconomic environment”. Nevertheless, by comparing the average values recorded in the countries

from the environment with the results of Serbia, we can notice that in spite of the marked progress in the pillars “Efficiency of the goods market”, “Development of the financial market” and “Technological competence”, there is still a lag (Bošnjak, 2011).

In the SEF report, in addition to data on the movement of IGCs and countries’ ranking, there is also a list of the most problematic country-by-country factors. In the latest report, there is a partial change in the factors identified by the businessmen as the most problematic for business in Serbia. As in the previous year, the biggest problem is the amount of tax rates, while with a very small difference, the problem of the funding source took the second place. The problems of inefficiency of state bureaucracy and corruption took the third and fourth place. Compared with last year’s survey, in 2017, as a minor problem, inadequate infrastructure, government instability and inadequately educated power ratios were assessed.

Based on the presented indicators on the degree of competitiveness of the national economy, we can conclude that, despite the positive trends from recent years, Serbia is still in an unfavorable competitive position, because there is still a lagging behind the countries of Southeast Europe, and this lag is even more pronounced in relation to the countries European Union. Bearing this in mind, the strategic goal of Serbia as a candidate for EU membership must be to increase the competitiveness of the economy. In order to achieve this goal, it is necessary to make permanent efforts in the direction of strengthening the key competitiveness factors, primarily those related to strengthening export activities and establishing a stimulating investment environment for investments.

In the future period of its development, Serbia will have to significantly increase the level of competitiveness of its economy by developing development processes to strengthen the factors that raise the level of productivity of the economy. Key measures and activities for increasing Serbia’s competitiveness and exports must be: creating a stimulating business environment and attracting investors, strengthening cooperation and integration processes in the region and Europe, active export and industrial policies that strengthen competitive economic sectors and branches, improving infrastructure (primarily road and railways), education reform, etc.

The need to build an export and investor-oriented model of economic growth

The essential transition characteristic of the Serbian economy in the period up to the onset of the global financial crisis was reflected in the discrepancy between production and consumption, i.e. a constantly higher level of aggregate consumption than the level of national production (about 20%). The structure of the use of GDP was characterized by high share of personal consumption and insufficient participation of fixed assets. In addition, the GDP growth of Serbia in the period from 2001-2008 based on the rapid growth of the service sector, which led to a low relative share of tradable goods in the sectoral structure of GDP formation. The consequences of this discrepancy have been reflected in the growth of the foreign trade deficit.

The global financial and economic crisis has shown that a sustainable model of economic growth, which was basically based on the growth of domestic consumption and imports and a low share of investments in the structure of the use of GDP, is an unsustainable until then. It has become clear that such a model must be replaced by a pro-investment and export-oriented model of economic growth. The expansion of domestic demand, on which economic growth was based in the observed period, was funded and stimulated by high inflows of capital from abroad. Growth in demand was not accompanied by an appropriate expansion of production, primarily in sectors of the interchangeable part of the economy (such as the processing industry). This led to the fact that economic growth was accompanied by the growth of the foreign trade deficit, relatively high inflation and the rise in unemployment.

After a long period of achieving relatively high economic growth rates, with the outbreak of the global economic crisis in Serbia, there is a break in the current economic trends. The economic crisis has led to a fall in aggregate demand, a reduction in inflows of foreign capital, an increase in insolvency and a recession in the economy. Under such conditions, it became clear that a new model of economic growth must be formulated, which should enable changes in the structure of the creation and use of GDP in the direction of strengthening the sector of tradable goods and increasing the contribution of investments financed from national and foreign savings and the contribution of exports to Serbia's economic growth. Thus, a new model of economic growth should enable the achievement of higher rates of economic growth and a significant share of exports and investments in GDP formation. This will enable an increase in the level of employment and the creation of more new jobs, as well as a higher standard of living and poverty reduction in the country.

Need for greater participation of the sector of commodities

Based on the trends in foreign trade flows in the second decade of the 21st century, we note that the participation of Serbia's commodity exports is almost continuously increasing, which, with the stabilization of the share of commodity imports, has led to a significant decrease in the share of foreign trade deficit. However, this does not mean that there has been a strong progress in exporting activities in our country. We conclude this on the basis that Serbia's exports relative to GDP are still significantly lower than in similar countries of Central Europe. While exports of goods and services in Serbia amount to about 44% of GDP, the share of exports to GDP in similar countries (Bulgaria, Czech Republic and Hungary) is around 80%. Starting from the level of external debt of the country and the need to import raw materials and reproductive material for domestic production, the export coefficient would have to reach a value above 50% of GDP (Ministry of Finance of the Republic of Serbia, 2015). Accordingly, Serbia has a large area for export growth and a reduction in external deficit on this basis. In addition, export growth is a key driver of sustainable growth in Serbia's economy in the coming years, so double-digit export growth rates would signal that Serbia is on a sustainable path of growth (Quarter monitor no. 40, 2015).

As we pointed out earlier, the sectoral structure of the formation of the GDP of Serbia in the first decade of the 21st century was changed in favor of the service sector. The dynamics and structure of economic growth in the observed period was not in the function of creating new comparative advantages in the international exchange and intensification of the export activities of the national economy. The established economic structure was such that the service sector dominantly contributed to the growth of social production, while the contributions of the production sectors that produce interchangeable goods declined (Serbia Development Report, 2010, p. 43). Thus, for the economic growth of Serbia in the period after 2000, the service sector with the average rate is the most deserving growth of gross added value of 4.6% annually. The service sector increased its share of GVA from 52.6% in 2001 to 63.5% in 2009. Within this sector, the largest expansion was achieved by the information and communication sector, the trade sector and the financial sector. In contrast, slower average growth in the sector of industry, as well as a decrease in its share in GVA from 23.3% in 2001 to 20.8% in 2009. At the same time, there was a decrease in the share of the manufacturing industry in the creation of GVA (with 21, 7% to 16.7%). The share of gross agricultural value added in the total GVA also recorded a significant decline (from 19.5% to 9.4%). The sectors of tradable goods have reduced the share in the formation of gross added value from 37.6% in 2001 to 21.6% in 2010. This reduced the supply of goods for export, which increased the current account deficit. Thus, the contribution of the interchangeable part of the economy to the overall economic growth in the observed period was relatively modest.

Problems that limit the stronger strengthening of export activities of the Serbian economy were also present in later years. In the first place, we point out the inadequate structure of the domestic economy, that is, unfavorable export structure, which cannot ensure satisfactory competitiveness in the foreign market. In the structure of our country's exports, reproduction products are still predominant, products of low level of processing, so structural changes in the real sector are a basic prerequisite for raising export competitiveness to a higher level. During the period 2000-2015. there is a moderate structural improvement in domestic merchandise exports, which is reflected in the increase in the share of products of higher processing phases. The technological structure and factor intensity of commodity exports have been improved, but these changes have not significantly improved the structure of domestic exports and, consequently, created the conditions for its strong long-term growth. The level of quality of Serbian merchandise exports continues to lag behind the countries of the EU, and to a lesser degree also for the economies of the countries of Central Europe.

Strengthening the sector of commodities (industry, agriculture) implies, above all, technological modernization according to EU standards and productivity growth and living standards on this basis. This sector needs to gain a competitive advantage in the market for products with high added value, instead of producing and exporting various raw materials and semi-finished products. Given that the structural characteristics of the economy are a permanent source of economic instability and an obstacle to economic

recovery and a stable long-term growth, and that the existing sectoral structure of the economy has not realized the efficient use of domestic resources, the process of structural reforms needs to be speeded up. Changing the sectoral structure of GDP requires an absolute and relatively fixed investment increase in the medium and long term, which is possible through the growth of domestic savings and a greater inflow of foreign investments as the main sources of financing the required level of investment. The change in the current economic structure with the construction and modernization of economic infrastructure is an imperative from the point of view of economic growth and employment, balancing the balance of payments and sustainable external stability.

The structure of the use of GDP - the need for greater share of investments

The relatively high growth rates of gross domestic product achieved in the first decade of the 20th century were primarily based on the growth of domestic consumption. High economic growth, as the main indicator of economic success in this period, was achieved with the growing fiscal and foreign trade deficit, a high level of inflation, low domestic savings and a high level of public spending and external debt. Economic growth was accompanied not only by internal but also by external macroeconomic imbalances. The deficits of the foreign trade and current account of the balance of payments had a high level, despite the rapid growth of exports. They were the result of a strong growth in imports based on the growth of domestic demand, due to the large increase in wages and public spending and strong lending activities of banks. Faster domestic consumption growth (above 7% annually) from GDP growth (5.4% averagely a year) caused the value of domestic consumption to exceed GDP by more than 20%. Expansion of domestic demand was financed and stimulated, first of all, by high inflows of capital from abroad.

Thus, both personal and government spending generated GDP growth in the above-mentioned period, while the increase in investment and exports was insufficient for faster economic growth and an increase in employment. Although a more favorable environment for business and investment of business entities was created, the current investment activity was still at a low level in relation to the development needs of the economy. Under such conditions, there could not be significant economic advancement, as fixed capital formation is the most important segment of GDP consumption from the point of view of development.

Table. 4. Serbia and neighboring countries: GDP growth 2014-2017

Countries	2014	2015	2016	2017
Serbia	-1.8	0.8	2.8	1.8
Environmental countries (weighted average)	2.7	3.6	3.6	4.3
Albania	1.8	2.2	3.4	4.0
BIH	0.3	3.8	3.1	2.3
Bulgaria	1.4	3.6	3.9	3.9
Croatia	-0.5	2.2	3.0	3.2
Hungary	4.2	3.4	2.2	3.7

Countries	2014	2015	2016	2017
BJRM	3.6	3.9	2.9	0.0
Montenegro	1.8	3.4	2.9	3.9
Romania	3.1	4.0	4.6	5.7

Source: EU Commission, European Economic Forecast - 2017

Unfortunately, low economic growth and insufficient participation of investments in the GDP structure still represent the main economic problem of the national economy. The data presented in the table show the achieved GDP growth of Serbia in the last four years. Observed in the regional context, we can conclude that Serbia is seriously lagging behind in terms of economic growth, not only for the developed countries of the European Union, but also in relation to the countries of our region. Although the economic growth recorded in 2016, the worst since the outbreak of the global economic crisis is still subdivided compared to the region. In 2017, the situation is even more unfavorable, as in Serbia there was a reduction in the rate of economic growth, while the countries of the region increased the rate of economic growth.

The main structural obstacle to establishing a high and sustainable sustainable economic growth is the insufficient participation of investments in GDP. A comparative analysis shows that the basic structural problem of the Serbian economy is a low share of investments in GDP. Namely, the current level of investment in Serbia is significantly lower than in the periods of intensified GDP growth from the previous decade, and is considerably lower than in the countries in the region. The average share of investment in GDP in countries in the region is almost 23%, while in Serbia it is only about 18%. The share of investment in GDP should increase from the current level of around 18% of GDP to around 25% of GDP and be directed primarily to the interchangeable sectors of the economy. The low share of investments in GDP in Serbia barely provides for the restoration of production capacities and infrastructure (as approximately their depreciation is), that is, it does not allow high and sustainable economic growth.

The main reason for the lack of investment is a bad investment environment. For this, among other things, appropriate economic policies are needed, which are primarily: 1) to strengthen and ensure the achieved *macroeconomic stability*, and 2) to improve the *investment environment*. With the necessary improvement of the business environment, the state should also directly increase its public investments, from the current 3.3% of GDP to the region average of over 4.5% of GDP. The greatest danger to *macroeconomic stability* is still threatened by the fiscal side. Although the growth of public debt relative to GDP has stopped, this has happened when the debt has already exceeded 75% of GDP, which is an extremely high level for a country like Serbia. With so much public debt, any new external “shock” and recession, such as the one in 2008, would lead to its new growth of over 80% of GDP and there would probably be a crisis. As a result, fiscal consolidation must continue as long as the government deficit does not fall below 1% of GDP, and public debt begins to accelerate sharply. Also, the large public and state-owned enterprises (EPS, Srbija gas, RTB Bor, etc.) are still largely unreformed public finances

and, consequently, macroeconomic stability - so the problems of these companies, after numerous delays, decisively resolve. In order to improve the *investment environment*, it is necessary to implement numerous reforms aimed at: education, health, increasing the efficiency of the judiciary, simplifying procedures and speeding up the issuing of licenses, combating corruption, and more (Quarter monitor no. 47, 2017.).

Conclusion

Competitiveness is the hallmark of modern business, which advances all countries and their businesses. The paper analyzes the competitive position of the Serbian economy in the international market, with special emphasis on the role of investments and exports and their impact on improving the performance of the domestic economy. The analysis focuses on key factors, elements and obstacles to improving business and competitiveness. In this respect, the main structural obstacle is the main structural obstacle to establishing a high and sustainable sustainable economic growth, which is insufficient participation of investments in GDP. In order to eliminate this obstacle and qualitatively improve the still insufficiently good investment environment, it is necessary to implement numerous reforms. Changing the present economic structure, with the construction and modernization of the economic infrastructure, is an imperative from the point of view of future economic growth and employment, balancing the balance of payments and sustainable external stability.

In the future period of its development, Serbia will have to significantly increase the level of competitiveness of its economy by developing development processes to strengthen the factors that raise the level of productivity of the economy. Key measures and activities to increase Serbia's competitiveness and exports must be: creating a stimulating business environment and attracting investors, strengthening cooperation and integration processes in the region and Europe, active export and industrial policies that strengthen competitive economic sectors and sectors, improving infrastructure, reforming education, and more.

Conflict of interests

The authors declare no conflict of interest.

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FARMLAND REAL ESTATE INVESTMENT TRUSTS

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ABSTRACT

The modern era has brought the need for the establishment of farmland real estate investment trusts. The establishment of these trusts positively affects growth and development of agricultural sector and ultimately contributes to global poverty reduction and sustainable development of the world economy and society. The research objective is to highlight the importance of these institutional investors as a new mechanism for investing in farmland and an additional source of financing for the agricultural sector. No studies on this issue in domestic and insufficient number of them in foreign literature have been a motive for the conducted research. The intention is to introduce investment community with the basic characteristics of farmland real estate investment trusts, as well as the key factors that arouse interest and lead to investment in farmland as new asset class.

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Introduction

Wealthy individuals' investment in farmland goes back into the distant past, while significant investment by institutional investors in this type of assets was recorded at a time of rapid growth in its value of the 1970s. Stagnation of demand that followed in the early 1980s led first to a decline in the price of agricultural products, and subsequently to a consequent decline in the value of farmland. Relevant studies describe this situation as farm crisis. Nevertheless, in late 1980s, investors' interest in farmland and farm facilities was renewed, and, according to Koeninger (2017), one of the factors that significantly contributed to their renewed interest was the article "Buy a Farm and Get Rich Slowly" by Barton Biggs, published in January 1988.

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The period to come was marked by significant investment of pension funds in farmland, where one of the main investment motives was the intention to improve the effects of diversification of investment given low and often negative correlation between farmland return and return on financial assets. In an effort to accept farmland as a new asset class, the National Council of Real Estate Investment Fiduciaries (NCREIF) Farmland Index was introduced in 1995, on the basis of pre-existing stock and bond indices. In this way, institutional investors got the opportunity and ability to assess farm, i.e. farmland managers' performance, by comparing the achieved return with the average market return, calculated on the basis of the NCREIF Farmland Index.

At the beginning of the 21st century, the growing demand for food, caused primarily by rapid growth of the world population and the growth of the purchasing power of population in developing countries, resulted in increased investment in farmland by individual and institutional investors. The demand for farmland increased especially during and after the global financial and economic crisis of late 2007, due to investors' search for a safer and alternative asset class. A few years later, in response to the growing demand for farmland, farmland real estate investment trusts (F-REITs) emerged.

F-REITs are a new type of farmland and farm facilities real estate investment trusts. Studies dealing with F-REITs are scarce even in the most developed world countries, which is not surprising given the short history of these trusts. The motive for the conducted research lies in an intention to at least partially mitigate the lack of relevant literature in this field.

Bearing in mind the foregoing, the research subject is F-REITs, as new farmland investment vehicles. The research objective is to introduce the investment community with the basic characteristics of this new category of farmland real estate investment trusts.

With reference to the defined research subject and objective, the paper will, after the introductory remarks and review of the relevant literature, analyze the importance of farmland as a new and attractive asset class. The emergence and development of the first world F-REITs will then be described. After that, the concept of functioning of these institutional investors will be presented, with inevitable indication of the key advantages and disadvantages of investing free cash in F-REITs in relation to direct purchase of farmland. Finally, the final part of the paper will summarize the views presented and consider opened questions of importance for future research.

Review of literature

Determining the real benefits of including farmland in investment portfolio is an issue that has aroused considerable interest of economists in the past decades. Numerous studies support the claim that the inclusion of farmland in the portfolio enhances its performance (Lins et al., 1992; Hennings et al., 2005; Painter, 2013a and others). Lins et al. (1992) and Hennings et al. (2005) found that farmland return is positively correlated with inflation and low or negatively correlated with return on stocks and bonds, so the inclusion of farmland into the portfolio brings protection from inflation, on the

one hand, and, on the other hand, increases the benefits of diversification. According to Kaplan (1985), farmland is a powerful inflation hedge, because, compared to other asset classes, it has the highest return correlation with the Consumer Price Index (CPI). In the study, the correlation coefficient between farmland return and CPI is 0.663, while the correlation coefficient between return of other asset classes and CPI is negative, except in the case of T-bills. The authors agree that extra return, resulting from the inclusion of farmland in the portfolio, is higher than additional risk, because, given the low correlation between farmland return and return on traditional assets, most of the additional risk is eliminated by diversification.

Given the above, but also stable long-term benefits that farmland investment promises, it is not difficult to conclude why farmland is for investors a serious candidate to improve portfolio performance. According to Robaton (2015), in the last 20 years farmland has had impressive returns as an asset class, outperforming major real estate sectors and most other types of investments. Between 1995 and 2013, the NCREIF Farmland Index had an average annual return of slightly more than 12 percent, while NCREIF's Commercial Property Index and Standard & Poor's 500 (S&P 500) index each had annualized return of about 9 percent.

The results of the research conducted by Painter (2013a) also highlight competitive farmland return. Assessing the North American farmland investment performance using the Capital Asset Pricing Model (CAPM), the Expected Value-Variance Model (E-V Analysis), and the Value at Risk Model (VAR), the author finds that the growing demand for farmland investment is due to the fact that farmland investment yield is very competitive with stocks, bonds etc., and the inclusion of farmland and portfolio enhances the effects of diversification, thereby improving overall investment performance.

Johnson et al. (2006) also examines the effects of inclusion of agribusiness assets in investment portfolios, to conclude that agribusiness return exhibits low correlation with return on stocks (coefficient of correlation being 0.48) and return on property (correlation coefficient being 0.23), and negative correlation with return on bonds (correlation coefficient being -0.06). Low and negative correlation confirms the previously stated claim that inclusion of agribusiness assets in investment portfolios improves the effects of diversification and brings benefits in the form of reduced investment risk. Some authors, such as Nartea and Eves (2010), believe that the benefits of inclusion of farmland in portfolio composed of traditional assets are reflected more in reducing risk than in improving return.

De Laperouse (2016) also points to low correlation between returns on farmland investments and the broader markets, and the consequent risk reduction potential. The author points out that, over the past 10 years, the correlation of the quarterly returns on the NCREIF with the Dow Jones Industrial Average (DJIA) has been 0.101% and with the S&P 500 it has been 0.098%. De Laperouse (2016) adds that farmland should not be understood as homogeneous but as a heterogeneous asset class, because of different geographical areas (Asia, Australia, South America, etc.), different types of production

(permanent crops, dairy, aquaculture, etc.), and different operating models (land ownership, farm management, value chain investment, etc.) available to investors, which provides an opportunity for intra-asset class diversification.

Pointing to the importance of investment diversification as an investment strategy to reduce investment risk, Coleman (2007) points out that the first step in building an agricultural investment portfolio is to identify regions where rainfall is uncorrelated and sectors where commodity prices are uncorrelated. In this way, protection against both drought and floods and the excessive volatility of commodity prices is achieved. It should also be noted that Coleman (2007) lists rainfall and commodity prices, and farm management and asset appreciation, as the most important factors of return on agriculture investment.

Among the available studies, the comparative analysis of farmland with gold and oil, given by Painter (2013b), is also worthy of attention. The author finds that all three asset classes have low correlation with stocks, bonds, T-bills, and other traditional asset classes, and that all three asset classes provide protection against inflation. However, the key advantage of farmland in relation to gold and oil is reflected in the fact that farmland provides better protection against inflation given higher positive correlation with CPI, and that, unlike gold and oil, generates revenue, which is why financial literature popularly refers to it as “gold with yield”. Owners of gold and oil are in a position to make profit based on the movement of prices of these assets, while owners of farmland, in addition to the movement of prices, have the opportunity to earn profit by organizing production on farmland, leasing land, etc. The potential profit brought by gold and oil is, due to the higher volatility of their prices, higher than income farmland promises, but, according to Painter (2013b), risk is three times higher. In the same paper, the author points out that, owing to the high positive correlation between farmland, gold and oil, the stated asset classes may be interchangeable as diversifying agents in portfolios.

Farmland as a new asset class

One of the most important steps in accepting farmland as a new asset class was the introduction of the NCREIF Farmland Index in 1995. NCREIF Farmland Index describes the overall trends on the farmland market in the U.S. and represents the basis for determining the average market return. It compares the average market return and returns of individual portfolios comprised of farmland, and the comparison is, as a rule, done on a risk-weighted basis. In this way, portfolio managers, individual and institutional investors find out if the created portfolio has achieved superior, average, or inferior performance compared to the market.

Farmland is currently experiencing an investment renaissance of a kind not seen in the United States since at least the 1970s and globally perhaps ever (Fairbairn, 2014). The key factors that generate investors' interest and the resulting investment in farmland as a new asset class are:

- Improving portfolio performance,
- Attractive and stable return with relatively low investment risk,
- Negative correlation between farmland return and return on traditional asset classes (stocks, bonds, etc.), which gives investors the possibility of efficient diversification of investment,
- Positive correlation between farmland return and CPI, which provides investors with protection against inflation,
- The rising demand for food as a result of the rising global population, longer life expectancy, and rising living standards and purchasing power of the population,
- Reduced food supply as a result of rising urbanization, accelerated land degradation, and climate change,
- Increased global demand for biofuel as renewable energy source obtained by biomass processing,
- Threatened global food security.

The above group of factors can be extended by the fact that farmland is less impacted by economic recessions, as demand for food is relatively inelastic to income. Also, one of the motives for investing free cash in farmland lies in the fact that the supply of farmland is limited, the possibilities for its growth are limited, while at the same time the demand for farmland for the previously described reasons is constantly increasing. Limited supply of farmland and, at the same time, rising demand for water increase the prices of farmland and investors' profitability.

It should also be noted that periods of financial crises, such as the crisis of early 2000s that hit the most developed world countries, and the financial and economic crisis of 2007-2009 that had a negative impact on the entire world market, are characterized by the spillover of cash from the market of stocks, bonds, and other traditional financial instruments into the markets of real assets, such as the farmland market. The main reason for the spillover of funds from the traditional financial instruments market to the farmland market is reflected in the fact that farmland, unlike securities, has a real value that is not subject to large fluctuations. Possession of farmland in a portfolio during a period of financial crises brings increased wealth protection.

All the aforementioned and explained factors make farmland an attractive asset class both for individual and institutional investors, and pave the way for its acceptance and inclusion in a diversified portfolio.

The emergence and development of F-REITs

Farm owners have always sought to consolidate agricultural holdings in order to realize the benefits of economies of scale and increase their profit. Also, they strove to procure

modern techniques and technology to increase labor productivity, efficiency of labor resources and technical equipment. Lack of funds forced farmers to take expensive loans from banks that increase the financial risk of a farm business and take the land for lease and pay cash or share leases. This created the need to establish F-REITs as institutions specialized in investing in farmland and farm facilities, which, from the perspective of farm owners, represent a cheaper and less risky source of financing.

Prior to the establishment of F-REITs, a large number of institutional investors, such as private equity funds, pension funds, hedge funds and sovereign wealth funds, were investing in agriculture and farmland. However, the key advantage of F-REITs in relation to the previously listed institutional investors is reflected in the fact that F-REITs are exempt from corporate income tax. In this way, they can avoid double taxation (taxation at the trust level and taxation at the individual investor level), which, from investors' perspective, equates tax costs between direct and indirect investment in real estate.

Investors' interest in farmland increased especially during the 2007-2008 world food price crisis. Some of the factors that led to the rise in the price of food commodities are the rise in oil price on the world market and the consequent increase in the cost of production of agricultural products, as well as the response of individual governments to the increased oil price by supporting the production of biofuel as a renewable energy source, obtained by biomass processing. The growth of food prices increased world hunger and had a negative impact on global food security, but at the same time had a positive impact on the growth of public and private investment in the agricultural sector. Public investment was undertaken with the aim of achieving food security, which is at the top of the list of sustainable global development priorities (Đurić, Njegovan, 2016), while private investment in the agricultural sector was realized to achieve profit.

In addition to food price crises, global financial and economic crisis of late 2007 also had a dual effect: on the one hand, it made it difficult to do business and reduced the availability of financial resources, while, on the other hand, it encouraged investment in the agricultural sector, primarily in farmland, given its resistance to crisis impacts. Increased investment in farmland is a consequence of investors' search for a safer and alternative asset class, which, owing to a negative correlation with traditional asset classes, improves the effects of diversification. The attractiveness of the agricultural sector in the crisis period is explained by the fact that the demand for food is inelastic.

Growing investment in farmland as a safer and alternative investment option continued even after the crisis years, resulting in the emergence of F-REITs – investment mechanisms specialized for investment in farmland. The first company that received the status of F-REIT is Gladstone Land (NASDAQ ticker symbol LAND). On 1 January 2013, the company made the initial public offering (IPO), and in the autumn of the same year it was declared F-REIT. On 31 December 2016, the company owned 58 farms comprised of 50,592 total acres, valued at approximately \$ 401 million (Gladstone Land, 2016).

A year later, F-REIT status was granted to the Farmland Partners (NYSE ticker symbol FPI), which in April 2014 made an IPO and thus became the second REIT in history

specialized for investing in farmland. On 31 December 2016, Farmland Partners had 115,489 acres of land in its portfolio (Farmland Partners, 2016).

The third established F-REIT is the American Farmland Company (NYSE ticker symbol AFCO). In October 2015, the company made an initial public offering and acquired the status of F-REIT. On 30 June 2016, American Farmland's portfolio comprised 22 properties with more than 18,322 acres that stretch across 13 states throughout the United States with 21 different crops (FBR & Co, 2016).

Half a year later, on 2 February 2017, Farmland Partners merged with American Farmland Company to form the largest F-REIT in the United States, which retained the Farmland Partners name and the ticker symbol FPI. The continuing growth and development of this F-REIT is best illustrated by the fact that since the IPO of April 2014 through August 2017, the portfolio owned by this trust rose 20 times, more specifically, from 7,300 acres to 154,000 acres – to be honest, in good part thanks to the merger.

The concept of functioning of F-REITs

F-REITs combine individual investors' funds, and then invest them in farmland, thereby gaining numerous advantages for their shareholders, such as providing professional portfolio management services, reducing investment risk through diversification of investment, reducing transaction costs by achieving economies of scale, etc. In addition to the foregoing, F-REITs provide their shareholders with:

- Higher liquidity of investment – stems from the possibility of relatively fast sale of these trusts' shares on the stock market, unlike farmland, whose sale requires time,
- Cheap diversification of investment – by purchasing one stock of the trust, the investor indirectly becomes the co-owner of the efficiently diversified assets of the trust,
- Greater security of investment – security has always been a feature of real estate investment, and has been further enhanced through effective diversification of investment.

Broad community can invest in F-REITs, as new farmland investment vehicles, regardless of the level of knowledge and the level of available capital. The establishment of F-REITs allows for small investors' participation on the farmland market with a modest amount of free cash.

The emergence of F-REITs has enabled the division of farmland as an asset class, which was previously unthinkable as land worth thousands or millions of dollars was sold in its entirety. Today, by purchasing one stock of F-REITs, minor percentage ownership is realized in a large number of agricultural parcels.

Investors in F-REITs expect stable long-term returns, with simultaneous protection against inflation, achieved thanks to a positive correlation of farmland returns with inflation. Investors in F-REITs also count on effective diversification of investment given low correlation between farmland returns and return on stocks, bonds, and other traditional classes of assets.

F-REITs do not promise investors quick, but steady growth in stock values with regular dividend payments. Regular payment of dividends to shareholders, or at least 90% of revenue generated, is a precondition that must be met in order for these trusts to retain the status of real estate trusts and enjoy tax exemptions. It is not difficult to conclude that investing in F-REITs suits more conservative investors with a low level of risk tolerance. At the same time, aggressive investors want to get richer as soon as possible, and invest in investment trusts with a more risky investment strategy and investment policy.

In order to maximize earnings, F-REITs look for underestimated farmland, which farmers are forced to sell due to financial difficulties. A good opportunity to earn is also the purchase of inherited farmland from families that do not want this type of asset and want to sell it as soon as possible.

In most cases, F-REITs buy farmland from local farmers leaving the farm, and then lease the same land to other local farmers who have a *strong operating history* and strive to expand agricultural production. Lease is an economic category originally associated with the phenomenon of income derived from the ownership of natural factors (Milanović, Cvijanović, 2009). The two basic types of lease that F-REITs receive as land owners are cash lease and share lease. Cash lease means that the lessee pays a fixed amount of money to the land owner, while in the case of share lease, the land owner receives a fixed share in the realized production. In the case of cash lease, F-REIT, as the land owner, is not exposed to market risks and risks of production, while with share lease F-REIT *shares the commodity risk / return directly*.

In addition to numerous benefits and positive sides, investing money in F-REITs has its negative sides. The key shortcomings of investing free cash in F-REITs in relation to direct purchase of farmland are:

- Investors bear the entire investment risk, but they do not get the full return due to management fee, and often the front-end fee and back-end fee charged by trusts,
- The choice of specific investment is beyond the control of investors – the decision on each individual investment in specific farmland is made by the portfolio manager of the trust,
- Lower profitability of investment due to a high degree of diversification of investment that implies the achievement of average return.

It should be kept in mind that the obligation of F-REIT to pay at least 90% of taxable income during the year to its shareholders, although it allows the exemption from income tax and provides attractive investment in these trusts, at the same time indicates a modest, unallocated part of profit that is used for reinvestment and expansion of

trust activities. The above speaks of the modest possibilities of self-financing the growth of these trusts.

Conclusion

For fear of losing land and jobs, local farmers and local population through history have often resisted the increased investment of institutional investors in farmland. They were afraid that losing their land would make them lose not only the source of income, but also local features, identity, and culture. That the fear of the local community was unjustified and that by far the largest part of farmland is still privately owned by farmers is confirmed by the view that the share of farmland owned by institutional investors, according to de Laperouse (2016), is today only about 0.5% of the total value of farmland on a global scale. Local farmers no longer perceive institutional investors as a threat to their business, culture, and tradition, but as a source of stable and long-term capital that contributes to the development of agriculture.

The above should be a source of opportunity to develop a global farmland real estate investment trust industry. With the establishment and development of F-REITs, farmland would, as a new asset class, become available to investors with a modest amount of free capital, insufficient for the purchase of farmland, but sufficient for the purchase of one or more stocks of F-REITs. The development of F-REITs would improve liquidity and marketability of farmland market. The funds of these institutional investors, in addition to financing growth and development of the agricultural sector, would ultimately contribute to the reduction of global poverty and the sustainable development of the world economy and society.

The establishment and development of the F-REIT industry would be particularly useful for developing countries that are in the long-term transition period. The potential benefits F-REITs could achieve by investing in farmland on the territory of these countries are: 1) organization of modern agricultural production, 2) putting into operation of farmland that has been out of use for years, 3) privatization of underperforming state-owned agricultural enterprises, 4) attracting large world producers of agricultural products to whom land is leased out, 5) opening new and well-paid jobs for the local population, 6) investing in infrastructure, and so on.

Although the prices of agricultural products have fallen in recent years, among other things, as a result of low oil prices and, hence, low production costs, the rising demand for food worldwide promises significant and stable return to investors in farmland, with simultaneous protection against inflation. In the following years, farmland return is expected to grow on the basis of: 1) the expected increase in the value of farmland due to global land rush, 2) the expected increase in agricultural commodity prices due to the rising global demand for food, and 3) the expected increase in agricultural productivity due to the application of modern techniques and technology and modern chemization and mechanization methods. Considering the expected growth of farmland return, the accelerated growth and development of the F-REIT industry is to be expected, primarily in the most developed countries of the world, and then in developing countries.

The above views have been presented in order to point out the importance of farmland as a new asset class, and F-REITs as new farmland investment vehicles. Future research will aim at enriching literature in this field, and will focus on empirical testing of the effect of including farmland in the portfolio, measuring the performance of the F-REITs portfolio, and comparing the achieved performance with the average market performance of the same and different asset classes.

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Conflict of interests

The authors declare no conflict of interest.

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APPLYING THE EXPONENTIAL SMOOTHING MODEL FOR FORECASTING TOURISTS' ARRIVALS – EXAMPLE OF NOVI SAD, BELGRADE AND NIŠ

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ABSTRACT

Predicting future movements of tourism demand based solely on the past behaviour of variables such as number of overnight stays is crucial for the development of tourism and mitigation of seasonality. Nowadays, there are many different models that could be used for forecasting. Sometimes, some simpler models could fit better to collected data and, in the other hand, more sophisticated ones are more convenient. In this paper, the exponential smoothing models have been applied on the data that was taken from Republic Statistical Office (RSO). The research was conducted on monthly data relating to the number of overnight stays in Belgrade, Novi Sad and Niš during the period from January 2000 to December 2013. Based on the selected data, forecasting was made for overnight stays until May 2018. It is concluded that the selected models correspond to the observed data, and the precision of the obtained predictions is determined by comparing the BIC precision measures.

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Introduction

The impact of seasonal demand variation is one of the dominant policy and operational concerns of tourism interests in both the public and private sectors. Forecasts of tourist arrivals are essential for planning, policy making and budgeting purposes by tourism operators (Gounopoulos et al., 2012). According to Claveria and Torra (2014), some of the reasons for this increase in the number of studies of tourism demand modelling

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and forecasting are: the constant growth of world tourism, the utilisation of more advanced forecasting techniques in tourism research and the requirement for more accurate forecasts of tourism demand at the destination level. The consolidation of tourism planning at a regional level in many countries is one of the main reasons behind the increasing demand for accurate forecasts of tourist arrivals in a specific region (Claveria, Torra, 2014).

The most important urban tourist destinations in Serbia are the main administrative centers, Belgrade, Novi Sad and Niš. Thanks to the favorable tourism and geographical position, natural values of the area, a rich cultural and historical heritage and accommodation facilities, these urban centers develop various forms of tourist movements. Therefore, it is necessary to make the analysis of tourist turnover, in order to highlight the main directions of tourism development.

Exponential smoothing (ES) methods have become very popular because of their (relative) simplicity and good overall performance. Such methods are sometimes also called naive because no covariates are used in the models, i.e., the data are assumed to be self-explanatory. They are also extremely easy to compute. In summary, ES is a weighted average of past values from an observed process that assigns a decreasing weight to past values (Maia, Carvalho, 2011).

This paper presents the analysis of an exponential smoothing model that allows us to forecast time series jointly, subject to correlated random disturbances and measured by Bayesian information criterion. The purpose of this study is to apply the Exponential smoothing (ES) methods to forecast the tourist arrivals to Belgrade, Novi Sad and Niš, and demonstrate the forecasting performance of this model. In this paper, the used data were taken from the Republic Statistical Office (RSO) and the survey covered the city of Belgrade, Novi Sad and Niš, Serbia with the aim to provide the empirical evidence that is the use of exponential smoothing model is useful for generating accurate prediction intervals, in practice.

Literature review

There are many strategies that are used to address the effects of seasonality. These include pricing strategies, diversifying the attraction, market diversification and seeking assistance from the government and industry bodies. Being ubiquitous, all tourism enterprises and regions are impacted by seasonality whether severely or mildly. Seasonality can be defined as “the temporal imbalance in the phenomenon of tourism, which may be expressed in terms of dimensions of such elements as numbers of visitors, expenditure of visitors, traffic on highways and other forms of transportation, employment and admissions to attractions”, (Butler, 1994, p.332; Cuccia, Rizzo, 2011). According to Cuccia and Rizzo (2011), the number of tourists is a measure of the quantitative dimension of the demand, while their expenditures measure the economic value of the demand for the tourism destination.

Seasonality has been studied in a number of ways; however, the concept relating to tourism activities is largely a temporal and spatial issue. In the context of tourism, it is usually expressed in both monetary terms (social and capital costs) and visitor (or customer) numbers (Jang 2004). One of the most comprehensive studies of the factors influencing seasonality in tourism is the work of Butler and Mao (1997). Their work is supported by other researchers (Gajić et al., 2015; Ursache, 2015; Papić-Blagojivić et al., 2016) who identify a number of similar dimensions of seasonality and present a variety of prescriptions for alleviating the negative impacts of seasonality. According to Butler and Mao (1997), seasonality has two dimensions: natural (physical) and institutional (social and cultural), involving both the origin and destination regions.

In order to influence the impact of seasonality on the destination, it is important to know the main tourist flows. The dominant time series in tourism forecasting studies is annual data. According to Onder and Gunter (2015), less than 10% of tourism demand forecast articles have used data with monthly frequency, even though the use of monthly data increases the number of observations, and despite the fact that accurate forecasts of tourist arrivals for the coming months are important from a short-term or operational tourism management perspective (Onder, Gunter, 2015). The most frequently used models for forecasting with monthly data is the Error-Trend-Seasonal or Exponential Smoothing.

For many years, various time series models have been successfully applied for forecasting tourist arrivals (Holt, 1957; Hassani et al., 2015). From the large number of models that are available today to the researchers this paper presents exponential smoothing models. Exponential smoothing model was first suggested in the statistical literature by Holt (1957), Brown (1959) and Winters (1960), and gained popularity as a forecasting method for a wide diversity of time series data (Everett and Gardner, 1985; Cho, 2003; Everett and Gardner, 2006). Exponential smoothing model is a widely used method in time series analysis and has been adopted in traffic forecasting for decades (Peng et al., 2008). The major advantage of exponential smoothing methods is that they are simple, intuitive, and easily understood. Forecasts based on exponential smoothing methods are computationally straightforward. Generally, exponential smoothing is regarded as an inexpensive technique that gives good forecast in a wide variety of applications. In addition, data storage and computing requirements are minimal, which makes exponential smoothing suitable for real-time application.

In order to accommodate trends and seasonality in the data, an appropriate form of exponential smoothing is the Holt-Winters procedure (Witt et al., 1994), and this is the model adopted in our study. This model formulation is based on the assumptions that each of the individual time series comes from the univariate Holt-Winters' model (Vallet et al., 2011), that all of them share a common structure, that is, common smoothing parameters, and that corresponding errors in the univariate models are contemporaneously correlated.

These models are less frequently applied in the tourism demand literature, despite evidence that they often provide adequate forecasts of directional and trend changes in tourism demand

(Cho, 2003). Smoothing models have ready application for forecasting tourism demand, since they can react quickly to changes in economic conditions and recent observations tend to be assigned larger weights in the forecasting process (Coshall, 2009).

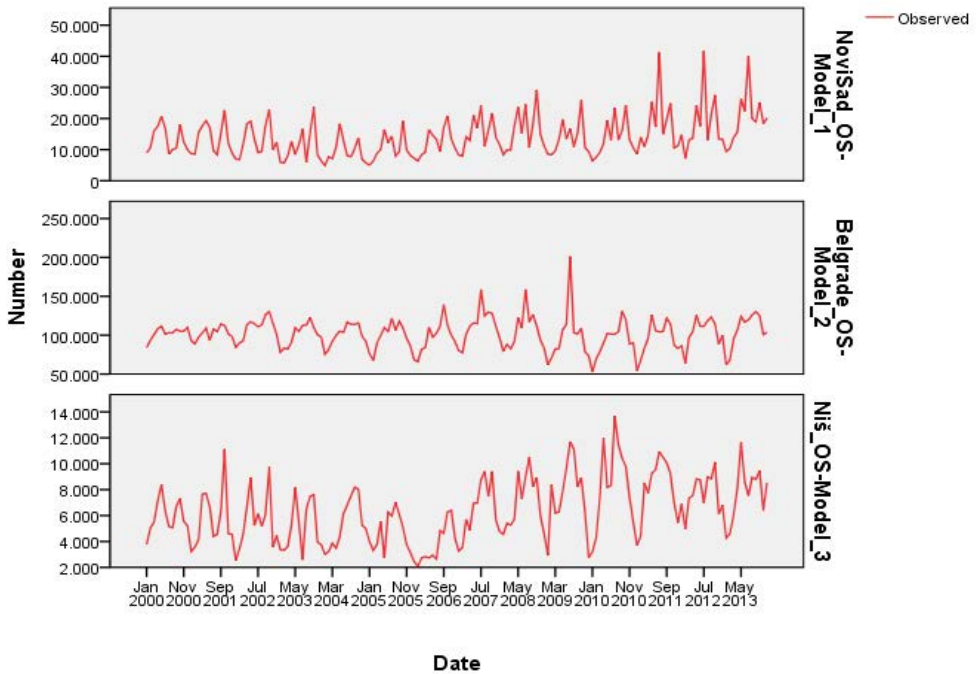
Exponential smoothing models have been shown to generate accurate forecasts of tourism demand (Lim, McAleer, 2002). It is a forecasting method that seeks to isolate trends or seasonality from irregular variation. It has been found to be most effective when the components describing the time series may be changing slowly over time (Yaffee, McGee, 2000). This method gives more accurate forecasts in the short run, as in our case, while the estimates for a longer period is less precise so the other methods are preferred. Their success is rooted in the fact that they belong to a class of local models that adapt their parameters to the data automatically during the estimation procedure, and therefore implicitly account for (slow) structural changes in the training data. Moreover, as the influence of new data is controlled by hyperparameters, this has the effect of smoothing the original time series (Maia, Carvalho, 2011).

In exponential smoothing, a new estimate is the combination of the estimate for the present time period plus a portion of the random error generated in the present time period. When used for forecasting, exponential smoothing uses weighted averages of the past data. The effect of recent observations is expected to decline exponentially over time (Cho, 2003). The main question is how much weight should be attached to each of the past observations, with the likelihood being that more recent readings have more influence on future forecasts of tourism demand than do observations a long way in the past (Coshall, Charlesworth, 2011).

Materials and methods

In the paper, the exponential smoothing models have been applied to the historical data of the number of overnight stays in the three cities and, based on the chosen accuracy measure, Bayesian information criterion (BIC), it was concluded that the model corresponds to the selected data very well. The used data were taken from the Republic Statistical Office (RSO) and the research was conducted on monthly data relating to the number of overnight stays in Novi Sad, Belgrade and Niš during the period from January 2000 to December 2013. In order to generate the forecasts, it is necessary to specify the values of the three smoothing constants (overnight stays in Belgrade, Novi Sad and Niš).

The series *Overnight stays* – Novi Sad, Belgrade and Niš is shown in the Figure 1. From Figure 1. it can be seen the presence of seasonal effects on the observed data. Factors of seasonal effects further confirm that there is larger number of tourists' arrivals in all three series during the period from April to October; also, each series has a certain characteristics. The figure shows that in the series *Overnight stays* - Novi Sad the significant increase in the number of overnight stays starts in May 2011.

Figure 1. Overnight stays in Novi Sad, Belgrade and Niš

In order to put in the same place the seasonal character of the observed series and trend component, authors used the three seasonal exponential smoothing models: simple seasonal and two different Winters models: additive and multiplicative. The Winters additive model adds to the Holts model the seasonal parameter. The other one, the multiplicative Winters model, consists of a linear trend and a multiplicative seasonal parameter δ . The general formula for multiplicative Winters model is (Yaffee, McGee, 2000, pp. 40):

$$Y \tau = (\mu + b_t) S_{t-p+h} + e_t,$$

where

μ is the mean of the observed time series at period t ;

b_t is the trend component;

S_{t-p+h} is the seasonal component, where p is the seasonality periodicity and h is the number of periods in forecasting; and

e_t is the forecast error at period t .

The exponential smoothing models use three parameters in forecasting: parameter α as weighting or smoothing parameter of level, parameter γ as weighting parameter of trend and parameter δ as weighting parameter for seasonal components. These parameters are all interrelated. For example, large value of δ will tend to have low value of α and vice versa (Cho, 2003).

Winters' additive and multiplicative exponential smoothing models incorporate these three parameters. The former model is appropriate for a series with a linear trend and a seasonal effect that does not depend on the level of the series. The latter model is appropriate for the same type of trend, but when the seasonal effect does depend on the level of the series (Coshall, 2009).

The Simple Seasonal and both Winters model were applied to observed data. According to the chosen precisions measure Winters multiplicative model is more convenient for the series *Overnight stays* – Novi Sad and Simple Seasonal model is more suitable for series *Overnight stays* – Belgrade and Niš because the Bayesian information criterion-BIC is the lowest for these models. The compared values of Bayesian information criterion are shown in the Table 1.

Results and Discussions

Results show that during the months of low season, the seasonal variation component has lower values (see January, February, November and December). While in July, August and September, this component has higher values. The consequences of this seasonal variation demand a strategic response in supply to overcome their adverse effects. Hence, tourist companies must adopt different measures to face the increase in demand, for example, in the number of staff hired, which may have negative implications derived from variations in training levels of employees or productivity levels (Guzman-Para, et al., 2015).

Table 1. Model statistics

Model	Model Fit statistics- Normalized BIC		
	Simple Seasonal	Winters Multiplicative	Winters Additive
Novi Sad-Model_1	16,187	16,164	16,223
Belgrade-Model_2	18,799	18,816	18,856
Niš-Model_3	14,636	14,836	14,711

Source: Own calculations

Chosen models were used for estimating the values of three parameters for series *Overnight stays* – Novi Sad, Belgrade and Niš and the results are shown in the Table 2.

Table 2. Exponential Smoothing Model Parameters

Model		Estimate
Novi Sad-Model_1	α (Level)	0,190
	γ (Trend)	0,001
	δ (Season)	0,420
Belgrade-Model_2	α (Level)	0,400
	γ (Trend)	0,000
	δ (Season)	0,000
Niš-Model_3	α (Level)	0,300
	γ (Trend)	0,000
	δ (Season)	0,005

Source: Own calculations

The low value of the parameter α (0.190) for the first series indicates that the observed series is quite stable during the period. From the value of the trend parameter γ it can be concluded that the slope of the trend line is constant during the observation period. The third parameter, δ , shows seasonal effects. In the series of Novi Sad, the impact of seasonal effects is more pronounced in comparison to the other two series, since the value of the parameter δ is 0,420. Considering that the observed parameters are interrelated, based on the higher values for parameter α and lower values for parameter δ for series Belgrade and Niš, we can conclude that the number of tourists stays in these two cities depends on recent data, with a constant trend and stable seasonal effect. On the other hand, the values of these parameters for Novi Sad indicate that the seasonal factor have greater influence. We assume that this is due to the pronounced seasonality (EXIT festival etc.)

Based on the selected models, forecasting was made for tourist arrivals until May 2018. The results are shown in Figures 2, 3 and 4.

Figure 2. Observed, fit and forecast values by applying Winters multiplicative model for the series *Overnight stays – Novi Sad*

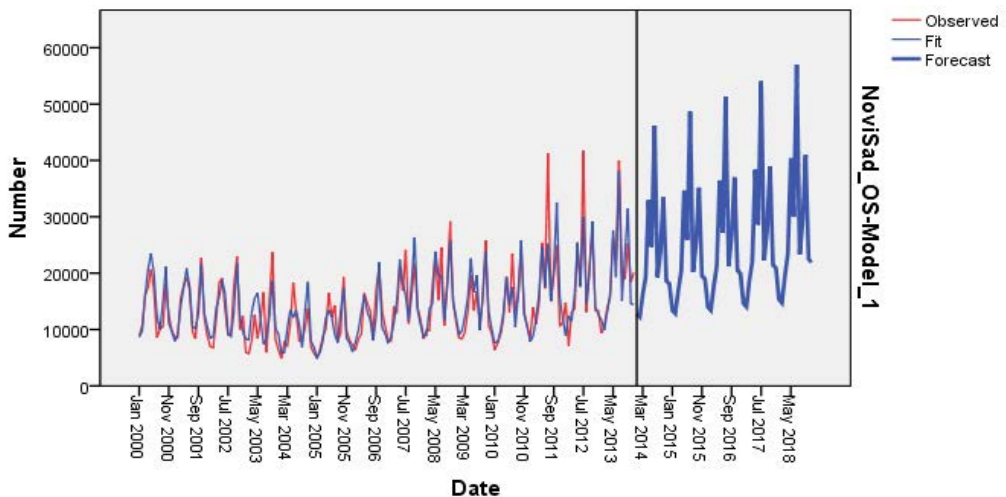


Figure 3. Observed, fit and forecast values by applying Simple Seasonal model for the series *Overnight stays – Belgrade*

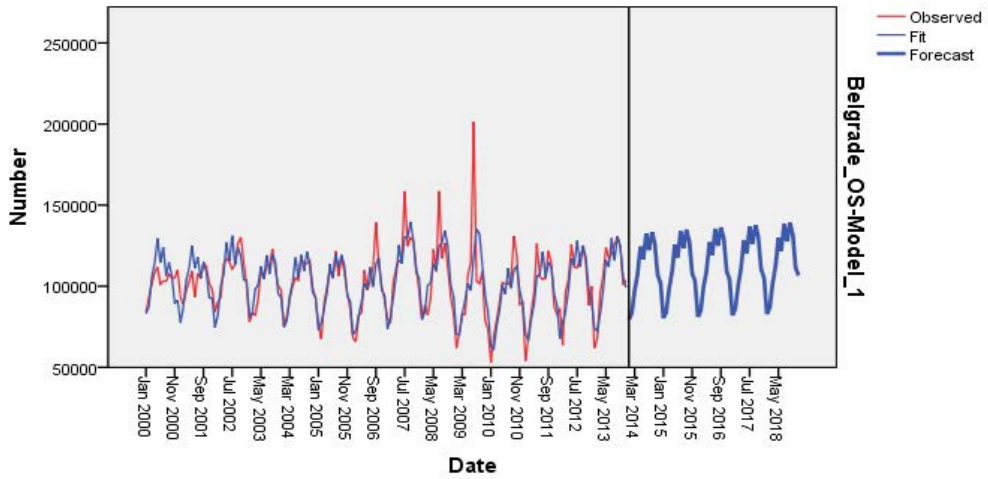
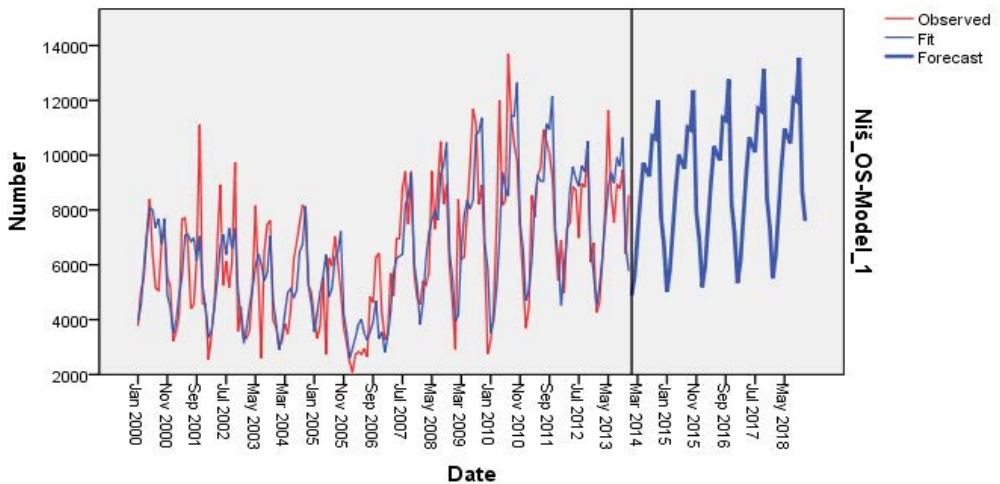


Figure 4. Observed, fit and forecast values by applying Simple Seasonal model for the series *Overnight stays – Niš*



Data from Table 2, Table 3 and Table 4, indicates that we can expect a significant increase of tourist turnover only in Novi Sad, in the observed period. The Novi Sad, Belgrade and Niš have many manifestations, and some of them are of international character, but on the Petrovaradin (part of Novi Sad), is maintains the one of the biggest European festivals “Exit” festival. So, we can conclude that we can expect more tourists in Novi Sad during the summer months. When it comes to Belgrade and Niš, we can conclude that these destinations are a frequent destinations for school excursions (spring and autumn), events, congress tourism etc., and in the observed period there will no be major oscillations.

Conclusions

It is important to say that tourism demand is influenced by many factors, including exchange rate fluctuations, relative inflationary movements, political/environmental events, and changes in holiday patterns. Planning for the future and forecasting what is likely to happen next, is crucial to the success of the whole tourism industry (Onder, Gunter, 2015). Without reducing the extent of the seasonal concentration, it will be very hard to create and maintain a competitive and sustainable tourist product. The statistical data of our case studies seems to show that forecasting of tourist arrivals can play a more strategic role in overcoming seasonality. However, such a process is not straightforward and requires the shared and coordinated action of policy-makers from different layers of government (regional, provincial and municipal) in different fields: tourism, culture, infrastructures and training to overcome the vertical fragmentation (between central vs. local government) that usually characterizes the public decision-making process (Vujko, Gajić, 2014).

As exponential smoothing models are used widely, it is imperative to investigate whether unit roots are present in the time series data prior to using these models. We employ a set of monthly time series for the number of tourist arrivals to Serbia. We consider the number of tourist arrivals from three individual tourist centers (Belgrade, Novi Sad and Niš) from 2000 to 2013. and have found that the analysis of an exponential smoothing model perform most desirably, especially when the forecast horizon is long. We asked for data from the Republic Statistics Office, and they gave us data for the observed period.

The results obtained from the prediction of real correlated time series are encouraging. Exponential smoothing methods within the framework of state space models have proved to be a successful methodology in the forecasting of tourism data. The main finding of the paper is that, in general, the prediction intervals from the exponential smoothing show satisfactory probability coverage properties and generate prediction intervals with desirable statistical properties, at least in the context of tourism forecasting. One of the disadvantage lie in the fact that this method has restrictions because of number of seasonal coefficients in the therm how often they are updated. Combining of several models and occasional repetition of the same calculation allows us to overcome this limitation. But, we also must underline that exponential smoothing has the advantage of being relatively easy to understand and use in practice.

Conflict of interests

The authors declare no conflict of interest.

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ANALYSES OF REGULATIONS REGARDING ACCOMMODATION FACILITIES CATEGORISATION IN RURAL TOURISM IN SERBIA

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ABSTRACT

The paper analyze the regulation on categorization of accommodation that relate to accommodation in rural tourism. The main aim of the paper is to estimate the point to which legal and administrative procedures reached in recognizing new forms of accommodation in rural tourism in Serbia as well as the level of compliance of legislation with some of the countries in the region. The results of the research render highly significant data on identification of roles, goals, procedures and purpose of the categorization aimed at pursuing market trends which is of crucial importance for tourism stakeholders. Moreover, the adjustments to international standards have become the imperative for Serbia to successfully continue the EU accession in this tourism branch as well.

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Introduction

Mass tourism travels and intensive hospitality development lead to intense competition in the process of obtaining more favourable positions within the network of accommodation capacities. Competition and market may stand as sufficient regulators of the necessary minimum for service quality and prices, primarily in developed countries with longer tourism tradition. Participation of more countries with different level of social and economic development into receptive tourism on the one hand, and participation of various population groups in domestic and international tourism travel on the other hand impose the need for categorisation (Bradić, 2008). In economically underdeveloped countries with small scale tourism, as well as regions with no competition, there is the objective need for protection of tourists staying in a categorised accommodation unit that will guarantee appropriate quality and price (Vukosav, 2010).

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Therefore, there is the need for law regulation in this area and precise definition of accommodation standards. World trends indicate that rural tourism is an ever growing concept with increasing refined needs of domestic and international demand. Rural tourism is a combination of various aspects of experience, sharing, and presenting rural form of living. Such rural experience may be defined with regard to rural activities and accommodation. Combination of those forms is the essence of rural tourism. What makes rural tourism unique is the contact with nature and personal contact with the local population. Rural accommodation combines different forms of tourism that portrait rural life, art, culture and heritage in rural areas (UWTO, 2010).

Serbia possesses excellent conditions for rural tourism development owing to its geographical position, versatile landscape for all forms of recreation, gastronomy, folklore, and rich cultural heritage (Guidebook for rural hosts, 2014). However, an enormous problem of accommodation capacities in rural areas and the major obstacle for rural tourism development is the categorisation of establishments. Regulation in this branch is partially disordered (Penić, 2015). It is complicated to compare standardisation of an ethno house to that of a local farm in Vojvodina. Moreover, the owners of both slow down the implementation of fiscalisation process. Nevertheless, more attention should be paid to standardisation of services and environment protection. Joint activities would undeniably lead to more opportunities in individual and collective promotion of rural tourism.

Gajić et al., (2017) concluded that the tourism facilities in rural tourism in Serbia cover relatively small areas, fail to host a large number of tourists, and have limited expansion opportunities. This research also indicates that categorisation is inadequate and over-needed and in that sense the aim of the paper is to estimate the point to which legal and administrative procedures reached in recognising new forms of accommodation in rural tourism in Serbia.

Role and importance of classification and categorisation in (rural) tourism

Growing number of participants in international tourism imposes the need for standardisation in the sense of separating different types and categories of hospitality units on the basis of different criteria, i.e. standards. The standards precisely define the requirements that need to be fulfilled in order to start hospitality business, describe various similar characteristics as the basis for object classification, determine the factors of the object type and verify elements that enable ranking of similar establishments by quality. Taking into account huge differences among countries, primarily concerning development level, number of types of hospitality establishments varies and changes quickly. Classification is exactly sorting and grouping of establishments into one class based on mutual characteristics, whereas categorisation comprises ranking of the same class establishments within a particular group according to quality. Institutions that prescribe the norms for the country are different, depending on the type and number of establishments that are owned either by individuals or by the country. According to that, there are various systematic solutions for classification and categorisation. A consumer selects the appropriate object to meet his needs according to the information obtained (Bradić, 2008).

Categorisation of tourist accommodation is a coded form which would synthesize the comfort level and range of services related to the specific category (Foris, 2011). The objectives taken into consideration through adopting an official classification system can be (Foris, 2014):

- 1) Customers' information;
- (2) The possibility to distinguish tourism accommodation structures, by implementing differentiated policies;
- (3) The possibility of a higher tax burden from the state to the products (luxury hotels);
- (4) A possible tariff regulation;
- (5) Facilitate communication, contract closing and monitoring, in the relationship between hotels and travel agencies.

The criteria for categorisation of tourist accommodation, taken into consideration by WTO, are the following (The European Consumer Centres' Network, 2009):

- | | |
|--|---|
| (1) Comfort level: | (a) Individual services; |
| (a) Superior (luxury, 4- and 5-star); | (b) Associations (voluntary professional chains); |
| (b) Medium (3-star); | (6) Ownership: |
| (c) Modest (1- and 2-star). | (a) Personal ownership; |
| (2) Location: | (b) Private; |
| (a) Seasonal; | (c) Governmental; |
| (b) Mountain; | (d) Joint; |
| (c) Climatic hydropathical areas; | (e) Public ownership; |
| (d) Urban; | (f) Public property of international concern; |
| (e) Rural; | (g) Time-sharing. |
| (f) Outside the cities, close to circulated areas. | (7) Capacity: |
| (3) Functionality motivation/length of stay: | (a) Reduced (small hotels, up to 150 beds); |
| (a) Transit; | (b) Medium (medium hotels, 150-400 beds); |
| (b) Special motivation (stay). | (c) Large (large hotels, over 400 beds). |
| (4) System operation: | (8) Target: |
| (a) Permanent; | (a) Business; |
| (b) Seasonal. | (b) Interest; |
| (5) Exploitation method: | |

- | | |
|---|-----------------------|
| (c) Holiday. | (a) Complete; |
| (9) Service standards and offered facilities: | (b) Economic; |
| | (c) Self-hospitality. |

To understand the essence of the classification system of tourism accommodation units related to rural tourism, from the point of view of the comfort level, the most important aspect is the regulatory activity from the international practice, which knows two different approaches in the elaboration of categorisation rules (Foris, 2014):

1. The rulemaking is assured by the authorities/institutions of the state (the national categorisation system);
2. The rulemaking is assured by the unions and professional organizations.

The Government of the Republic of Serbia, i.e. Ministry of trade, tourism and telecommunications prescribes or issues Regulation on classification and categorisation of accommodation establishments. It may be said that the current Regulation recognises the importance of regulations in rural tourism.

Methodology

Research methodology comprises collection, analysis and interpretation of data about categorisation of accommodation facilities in rural tourism on national level (Serbia), using the following documents: Serbian Law on Tourism, By-laws of the Law on Tourism, that is, the part of the Regulation on the categorization of accommodation facilities related to the categorization of accommodation in rural tourism in Serbia, Croatia and Slovenia, books, doctoral thesis, master papers in the field of tourism, as well as papers from journals dealing with this issue in the last 12 years, online databases (www.eurogites.org), etc. Moreover, in the paper is applied analytical-synthetical method and comparative method.

Development of rural tourism accommodation in Serbia

Nowadays, rural tourism is one of the ever growing tourism products due to increasing demand and possibility to develop in various directions (combining numerous other tourism products). Serbian rural tourism product is far from the unknown since there are data from 1980s about 50 villages with 800 households and 3,000 registered beds with developed tourism offer. In 2011, rural tourism in Serbia had 32,000 beds (registered or not-registered) in rural areas, out of which 10,000 beds were exclusively for rural tourism (Master Plan of Sustainable Rural Tourism Development in Serbia, 2011). Today, about 300 rural households with 8,000 beds, offers hospitality services and generate more than 150,000 overnight stays per year (Petrović et al., 2017). It is very difficult to determine the exact number of accommodation units in rural tourism. Certainly, their number grows year after year but regardless of significant increase in the number of beds, rural tourism as a tourism product in Serbia remains underdeveloped.

Basic prerequisite for tourism development in villages of Serbia is the application of appropriate standardisation and categorisation of services, especially for appropriate accommodation conditions. The key role in rural product development belongs to the combination of activities in rural areas with rural accommodation. Serbia needs to not only develop various activities but also to improve the existing. It is necessary to define and develop types of rural accommodation as the support for rural tourism in Serbia. Also, the level of accommodation should achieve international standards and rural accommodation should be differentiated in tourism offer of Serbia.

Current offer of rural accommodation capacity should be developed as typically Serbian rural offer with traditional accommodation in ethno villages, traditional farms, salaš (traditional farms in Vojvodina), cottages, vajat (wooden small houses without windows, usually situated in the backyard) and lodges. Minimum standards also need to be determined in rural accommodation development and in concordance with international minimum standards. Rural accommodation should in the future focus on authentic and genuine features. Branding of this accommodation type should be used as a means of future differentiation (Durman-Pušara, 2012).

Accommodation strategy within the Master Plan of Sustainable Rural Tourism Development in Serbia defines new types of accommodation that Serbia might offer: tree houses, grass igloos and ship houses. Tree houses are especially interesting for tourism development which is connected to the nature and could be implemented on Stara planina (mountain), primarily for children and young adults (Master Plan of Sustainable Tourism Development in Serbia, 2011).

Historical review of regulations regarding classification and categorisation in Serbia

The first categorisation regulation in hospitality in Serbia was enacted in 1947. It was conducted with the aim of distinguishing outstanding hospitality establishments from the other. Hotels were ranked in three categories. Quick tourism development imposed the need for adjusting the accommodation offer with the trends. Thus, a new regulation was enacted in 1955 – The Regulation for hotels and pensions categorisation. The categorisation was conducted by the Association of hospitality chambers of Yugoslavia. Hotels were ranked in four categories, each represented by a letter (A, B, C or D), pensions were ranked in three categories – the first (I), the second (II) and the third (III). At the beginning of the 1962, the Regulation was amended by Extra category for the most comfortable and luxurious hotels. Other hospitality establishments that offered accommodation did not comply with the regulations from the Regulation and were classified into hostels or inns without categorisation (Kosar, 2015).

Tourism development dictated ever growing network diversification of hospitality establishments for accommodation purposes and also the changes in the classification and categorisation. The new Regulation on categorisation of hospitality accommodation establishments was adopted in 1967 and amended in 1970. The Regulation was valid for

the whole territory of the former Yugoslavia, comprising the following types of hospitality accommodation establishments: hotels, tourist settlements, motels, pensions and camps. Hotels and tourist settlements were categorised into five categories, represented by one letter each, with the introduction of letter L for luxurious category, and the motels, pensions and camps were categorized into three categories (I, II, and III).

The need for the adjustment with international classification standards for hospitality accommodation establishments brought to the changes in statistical records in this sector. According to the Law on Classification of services and Registry of classified units (FRY Official Gazette 31/96, 12/98, 59/98 and 74/98), hospitality services were represented with a large group named "Hotels and restaurants", that comprised the whole sector of hospitality accommodation services and food. Within the accommodation sector there were two groups:

- 1) Hotels
- 2) Camps and other accommodation facilities for short stays.

Hotels comprised the accommodation services, especially intended for shorter stays in the following establishments: hotels, motels, inns and hotels suitable for conferences.

The group Camps and other accommodation facilities for shorter stays comprised: camps, youth resorts, dorms and houses, as well as a large sub-group under the name "other, not listed accommodation establishments".

Since 1994, Serbia has been applying the Regulation on classification, minimum conditions and categorisation of hospitality establishments (RS Official Gazette 66/94, 3/95). According to that Regulation, hospitality establishments are classified into two basic groups:

- 1) Hospitality establishments for accommodation,
- 2) Hospitality establishments for food and beverages services (Article 5).

Hospitality establishments for accommodation purposes according to the Regulation (Article 6) are:

- Hotel,
- Motel,
- Pension,
- Tourist apartment,
- Tourist settlement,
- Camp,
- Holiday house or flat,
- Room for rent,
- Resort.

Hospitality establishments for accommodation also include other facilities intended for holidays and recreation of special groups of customers (children resorts, youth resorts/hostels, mountain lodge, houses, etc.). Resorts and other establishments intended for holidays and recreation of special category of customers are closed type establishments offering accommodation and food services or only accommodation only for the employees, children or youth, members of associations and organisations or founders of the resort.

Hospitality service in Serbia was regulated by the Law on tourism (RS Official Gazette 36/2009, 88/2010, 99/2011 and 93/2012) as well as by additional bylaws, among which special emphasis is on the current Regulation for the hospitality business, hospitality services, classification of hospitality establishments and minimum technical conditions for design and equipment of the establishments (RS Official Gazette 48/2012). This Regulation regulates the conditions and forms of doing business in hospitality industry, rendering hospitality services, classification of hospitality establishments, minimum technical requirements for design and equipment of hospitality establishments with regard to the form and type of services offered in or outside the establishments, in movable facilities, households and in rural tourism establishment. Pursuant to this Regulation (Article 4), the establishments are divided into following groups according to the type of services:

- 1) Hospitality establishments for accommodation,
- 2) Hospitality establishments for food and beverages,
- 3) Hospitality establishments.

Hospitality establishments for accommodation purposes, according to this Regulation, render the following hospitality services: accommodation, preparation and serving of food, alcoholic and non-alcoholic beverages and other usual hospitality services. Hospitality establishments for food and beverages offer the following services: preparation and serving of food, alcoholic and non-alcoholic beverages, or preparation and serving of alcoholic and non-alcoholic beverages. In hospitality establishments food and beverages are only prepared to be served and consumed on other location. The Regulation (2012) defines the following types and subtypes of hospitality establishments for accommodation: 1) Hotel, 2) Apart hotel, 3) Garni hotel, 4) Motel, 5) Tourism settlement, 6) Apartment settlement, 7) Camp, 8) Pension, 9) Hostel, 10) Inn, 11) Resort, 12) House, 13) Apartment, 14) Room, 15) Rural tourism establishment, 16) Hunting villa, 17) Hunting house, 18) Hunting hut, 19) Other establishments (lodging, "han", "konak" ethno house, villa, camping site, camping rest area, camping stop, etc.). If we compare the two latest Regulations it is noticeable that Serbian market has recognized certain new accommodation establishments, such as rural tourism establishment which is considered a step forward. However, differentiation and typisation of accommodation establishments in rural tourism and regulations is still insufficient with regard to the situation in the some neighboring countries that are members of European Union.

The role of the state and public sector in rural tourism development and accommodation standardization

Rural tourism development with the special emphasis on agro-tourism or farm tourism has been the policy focus of the most European countries which aim at advancement of global social and economic development in rural areas which have been suffering from deagrarianisation and depopulation trends. The following measures of rural tourism development policy in EU have been applied (Petrić, 2006):

- Administrative help which includes cheaper, faster and easier access to information;
- Better legislation;
- Training; educational institutions offer training programmes suitable to the needs of potential tourist service givers;
- Taxing and finance: taxation system that will alleviate the life of rural establishments and other enterprises related to tourism activities in rural areas;
- Easier access to finance: necessary to ease the access to financial help, structural funds, beneficial bank loans; special initiative should be provided in the regions where depopulation processes are more prominent;
- Infrastructure construction;
- Marketing.

There are organisations in charge of rural tourism development throughout Europe, e.g. “The Non-profit Association of Rural Tourism” in Belgium, as well as regional organizations in charge of agro-tourism development, e.g. “Accrual Champers” and “Gates de Wallonia”, in Wallonia and Logeren in Vlaanderen in Leuven (<http://www.eurogites.org/member.php?lang=EN&id=BE>). Polish Federation of Country Tourism has been founded in Poland, where rural tourism development has been supported by the network of 16 advisory agricultural centres <http://www.eurogites.org/member.php?lang=EN&id=PL>). Rural tourism development in Great Britain has been entrusted to the organisation Farm Stay UK that is National Agricultural Centre (<http://www.eurogites.org/member.php?lang=EN&id=UK>). The Rural Tourism Association of Mecklenburg-Vorpommern has been the specialist organisation for rural tourism in this federal state in the north east of Germany since 1991 (<http://www.eurogites.org/member.php?lang=EN&id=DE>). The most significant rural tourism association in Austria is “Urlaub am Bauernhof”, which was founded in 1990 and supported by the Ministry of Agriculture and Economy (<http://www.eurogites.org/member.php?lang=EN&id=AT>). The National Association for Rural, Ecological and Cultural Tourism in Romania, (ANTREC) was set up in 1994 and has now over 30 branches all over the country (<http://www.eurogites.org/member.php?lang=EN&id=RO>).

The Strategy for the Development of Tourism of Serbia (for the Period 2016 – 2025) is document adopted in 2016. and presents medium-term and long term economic measures panned by the state and local administration. These were identified on the basis of the existing conditions, the anticipated impact of current policy on tourism in Serbia as well as changes and trends in the world tourist market. Rural tourism is seen as important auxiliary economic sector and branch of tourism which will improve and secure the sustainable development of rural communities. The main goal of rural tourism is to generate additional income of rural population, covering a range of tourism attractions, services and secondary activities provided by the rural population and private households (Strategy for the Development of Tourism of the Republic of Serbia, 2016).

It is believed that rural tourism would contribute to accession of Serbia to the EU (Strategy for the Development of Tourism of the Republic of Serbia, 2016). In this sense the Strategy for the Development of Tourism of the Republic of Serbia (2016-2025) gives a list of priority activities and funding programs supported by the EU that Serbia should use as a candidate country (Strategy for the Development of Tourism of the Republic of Serbia, 2016):

1. Extension service to support farmers, forest owners, small and medium-sized enterprises in rural areas to improve their economic performance and inclusion in value chain and rural tourism development;
2. Support for start-up and investment in non-agricultural activities in rural areas (rural accommodation, shops, restaurants, tours, ...);
3. Developing and updating plans for the development of municipalities and villages in rural areas;
4. Studies and investments related to the maintenance, restoration and improvement of the cultural and natural heritage of villages, rural landscapes and natural areas of high value, including socio-economic related activities, as well as raising environmental awareness for concrete actions;
5. Creation of strategic business areas, cooperation between small operators in organizing the common labor market and the use of facilities and funds for the development and / or marketing of tourism services related to rural tourism and other related activities).

Aiming at rural tourism development, the Government of the Republic of Serbia, also developed the Master Plan for Sustainable Rural Tourism Development in the Republic of Serbia which was defined as economic, social and environment priority of the Government in 2011.

Sustainable development plans are efficient response to problems of people, communities and private sector as well as promotion of rural development and ecological protection. Special emphasis is on national and regional planning and interventions in four target regions comprising Eastern Serbia, the Upper Danube Basin, South Banat and Central Serbia (Master Plan for Sustainable Tourism Development, 2011). Rural economy

diversification on socially, economically and ecologically sustainable grounds is necessary for improvement of the quality of living, decreasing poverty and fighting against social and ecological degradation (Bogdanov, 2007).

Rural tourism accommodation facilities play a key role in advancement of rural product development that combines activities in rural areas with rural accommodation. There are estimates on strong need for improvement and development of accommodation capacities in rural areas of Serbia (Penić, 2015). Rural accommodation has the potential in offering wholesome tourism experience with adjacent rural activities (Penić, 2015). The operations to be undertaken to develop rural accommodation are defined within the Master Plan (Master Plan for Sustainable Tourism Development, 2011):

- Definition and development of rural accommodation typologies necessary for rural tourism support in Serbia,
- Improvement of accommodation quality to meet international standard requirements,
- Differentiation of rural accommodation offer in Serbia,
- Increase of rural accommodation capacity in target areas.

Minimum standard requirements should be set for each rural accommodation typology. They need to be defined with regard to comfort level, with special emphasis on bathrooms. The example of minimum standard is to provide bathroom for each room, not to share bathroom with other guests or even with rural establishment members. It depends on the number of the guests, but also certain types of accommodation imply shared bathrooms (youth hostels). Minimum standards have to be established for each type of rural accommodation taking into account special details that make the accommodation attractive. In addition, minimum standards should be in accordance with international standards. This should be taken into account regarding the funds for future projects and priority should be given to the projects that meet minimum standard requirements.

Rural accommodation offer should be further differentiated in order to achieve authentic and unique features. Its branding should be used as means of further differentiation. Quality labels need to be designed for rural accommodation in order to additionally guarantee quality for the tourists.

A Serbian village house and a house on the farm are two crucial accommodation types that need quality labelling, which would strengthen and advance Serbian form of rural accommodation. Labels in rural tourism should be developed in the following manner:

- traditional rural accommodation: accommodation in a traditional well-preserved village with facilities for tourism activities,
- quality labels for houses on farms: these labels need to be used for branding Serbian houses on farms, e.g. “Salaš” farms should be labelled as traditional houses on the farm with specific architectural style.

The examples of quality labelling houses on farms that have been successfully used in developed rural tourism destinations are the labels Farm Holiday (Austria), Farm Stay (Great Britain) and Bienvenue a la Ferme (France). One of the rural accommodation types used in tourism practice is a rural hotel. Special labels for hotels in rural areas should also be defined. The following criteria should be pursued:

- located in a rural area or its vicinity: isolated or in the town with the population under 1,000.
- typical architectural style that preserves the unique architecture of the area/region.
- limited number of rooms (less than 70).
- specific features: F&B unit supplied with local agriculture products.
- rural establishment: This label should be used for creating a strong brand typical for Serbian rural tourism accommodation. It may comprise traditionally built houses with material and architecture typical for the region. The examples of such rural tourism brands are Gates de France and English Rose.

Various types of accommodation that may be related to typically Serbian architecture and style may also comprise accommodation in traditional monasteries, cultural heritage buildings or mill houses (Master Plan for Sustainable Rural Tourism Development, 2011).

To sum up, Master Plan for Sustainable Rural Tourism Development in the Republic of Serbia was created in 2011 with clear development goals for rural accommodation quality and standard improvement and with the aim of pursuing market trends and international standards. New Regulation on categorisation standards for accommodation in hospitality in the Republic of Serbia was enacted the following year. The following analysis will present the concordance of law regulation with the Master Plan aims and whether the types of rural accommodation have been clearly defined as well as their categorisation criteria conducted by the Ministry of trade, tourism and telecommunications of the Republic of Serbia. Also, comparison with the neighbouring countries will also be presented here.

Analysis of the existing laws regarding accommodation facilities (rural accommodation review) and comparison to the neighbouring countries

Both in Serbia and the neighbouring countries, the process of categorisation is conducted by the authorities. Only the accommodation facilities are obliged to undergo categorisation process. Hospitality facilities for providing food and beverage services are not categorized. That is different from the previous regulations from 1994, according to which a variety „restaurants” were in the group of hospitality facilities that are categorized. Categorisation domain was regulated by the Regulation on Categorisation Standards for Accommodation Facilities (RS Official Gazette No.41/2010, 103/2010 and 99/2012).

There are certain changes in the scope of categorisation compared to the previous regulations, which came as a result of changes in classification and concordance with the regulations in hospitality business, minimum technical requirements for hospitality business, as well as differentiation and grouping of hospitality facilities. To sum up, categorisation process is mandatory for all types and sub-types of accommodation facilities in Serbia according to the regulations in force (Regulation on Categorisation Standards for Accommodation Facilities (RS Official Gazette No. 41/2010, 103/2010 and 99/2012) :

- 1) Hotels,
 - Garni hotels,
 - Apart hotels,
- 2) Motels,
- 3) Tourism settlements,
- 4) Camps,
- 5) Pensions,
- 6) Houses,
- 7) Apartments,
- 8) Rooms,
- 9) Rural tourism establishments,
- 10) Hunting villas (hunting tourism facilities)
- 11) Marinas (nautical tourism facilities)

Categorisation standards in hospitality business comprise mandatory elements labelled by “M” and optional elements established for each category to provide additional points in concordance with the Regulation. Mandatory elements refer to minimum requirements regarding organisation, equipment and services within a certain category. Points are not assigned to mandatory elements. Elective elements also refer to organisation and equipment, services, i.e. location and design of the place. Certain number of points is assigned based on each established elective element. Regulation prescribes certain minimum of points for elective elements for each category of accommodation facilities. These elements are not precisely defined, but the owners opt for certain elements from either material or non-material criteria which are in concordance with the type and market orientation of their facilities. In case the object fails to obtain minimum points based on elective elements for a certain category, then the object cannot be ranked for that category despite the fact it meets the mandatory criteria. That is the essence of elective elements that were introduced in 1994 as a novelty regarding previous regulations in categorisation process. Newly introduced regulations proved effective since they enable hoteliers to create authentic combinations of services that are assigned appropriate points and finally create original products in hospitality. According to this,

the points assigned for elective elements have been retained in the current regulations. The points for only elective elements are assigned to facilities of the highest category. In case there is no possibility for facilities from lower categories to achieve minimum points for elective elements, the missing points may be obtained from mandatory elements for higher category facilities (Kosar, 2015). Described procedure indicates that categorisation is a continuous process which demands higher level of professionalism and responsibility of authorities as well as the efficiency of the controlling system.

Further development of rural tourism needs the application of appropriate standardisation and categorisation of services, especially adequate accommodation. Law on Tourism refers to the segment of accommodation and food in establishments as a specific form of hospitality services. The facilities from the establishment accommodation group are subjected to categorisation conducted by local authorities, i.e. municipalities where they are located. This group of facilities, i.e. accommodation facilities in rural tourism consists of: houses, apartments, rooms and rural establishment (Law on Tourism, RS Official Gazette No. 36/2009, 88/2010, 99/2011 and 93/2012). All the facilities intended for tourists must meet the sanitary-technical requirements and organised into appropriate categories regulated by the act of the municipality authorities, which was regulated by the Regulation from the year 2012.

Certain number of stars symbolises certain category of the object. Rural tourism facilities are categorised in the following manner (Regulation on Categorisation Standards for Accommodation Facilities, RS Official Gazette. No. 41/2010, 103/2010, 99/2012):

- Houses – in four categories: the fourth marked by one star and the first marked by four stars;
- Apartments - in four categories: the fourth marked by one star and the first marked by four stars;
- Rooms - – in three categories: the third marked by one star and the first marked by three stars;
- Rural tourism establishments - in four categories: the fourth marked by one star and the first marked by four stars;

Rural tourism establishment is a new type of accommodation object, introduced in Serbian classification in 2010, as a result of country's commitment to intensify rural tourism development and use natural and ethnic potentials of rural settlements. According to Regulation on requirements and types of hospitality business, forms of hospitality services, classification of hospitality facilities and minimum technical requirements and design of hospitality facilities, rural tourism household is a hospitality object or a group of hospitality facilities situated in a rural surrounding with elements of locals features and heritage which offers accommodation, food and beverage services. In certain instances, this Regulation also provides that rural tourism establishments may offer only food and beverage services.

Table 1. The score based on elective elements for various types of accommodation in rural tourism in Serbia

Type of accommodation object	Score/category				
	5*	4*	3*	2*	1*
House	/	50	40	30	20
Apartment	/	45	35	25	15
Room	/	/	30	20	10
Rural tourism establishment	/	50	40	30	20

Source: Regulation on Categorisation Standards in Hospitality Accommodation, (RS Official Gazette No. 41/2010, 103/2010, 99/2012);

Rural tourism establishment is a new type of accommodation object, introduced in Serbian classification in 2010, as a result of country's commitment to intensify rural tourism development and use natural and ethnic potentials of rural settlements. According to Regulation on requirements and types of hospitality business, forms of hospitality services, classification of hospitality facilities and minimum technical requirements and design of hospitality facilities, rural tourism household is a hospitality object or a group of hospitality facilities situated in a rural surrounding with elements of locals features and heritage which offers accommodation, food and beverage services. In certain instances, this Regulation also provides that rural tourism establishments may offer only food and beverage services.

The above discussed special minimum technical requirements that should be met by hospitality facilities in rural establishments were additionally defined by the Regulation on minimum technical and sanitary-hygienic requirements for hospitality services in rural farms and rural tourism establishments (RS Official Gazette No. 41/2010 and 48/2012). Rural tourism establishment provides the facilities for guest to prepare food. Food and beverage services may be also offered outdoor. Mandatory requirements for food preparation and service in rural tourism establishment are identical to those intended for local household establishments: houses or apartments. What needs to be done is to clearly define the elements of organisation and equipment of a rural establishment that would contribute to original and authentic of the area it represents. Each owner of a rural establishment should invest into upgrading own hospitality standard to the highest possible level, with the highlight on original and authentic offer. In neighbouring Croatia there is a special "Regulation for owners" which prescribes that traditional establishment cannot use plastic tablecloth, Chinese curtains, machine-made carpets, etc. In return, the owner would get bonus points for exclusiveness and originality of the accommodation and may raise the accommodation price (Durman-Pušara, 2012).

According to the latest Regulation (2012) accommodation units in rural tourism establishment are rooms with or without bathroom. Mandatory elements for the rooms and bathrooms are prescribed by minimum technical requirements for accommodation establishments. Nowadays, pursuing modern trends at tourism market as well as Master Plan definition, the guests look for rooms with bathrooms in each categorised object, i.e. accommodation unit regardless the category. That is the base for further

differentiation of rooms in rural establishments. Moreover, equipment and organisation should reflect traditional style that is different from the style in towns, spas or other tourism destinations, which is not the case according to the present Regulation.

If the rural tourism establishment also breeds domestic animals, this activity has to be organised in specially designated areas, distant from the premises intended for the guests. Such specially designated areas have to be in the area that enables good ventilation and prevent odors spreading to the areas intended for guests (Regulation on Minimum Technical and Sanitation-Hygiene requirements for hospitality services in rural tourism establishments, RS Official Gazette No. 41/2010 and 48/2012). It may be concluded that current regulation for rural accommodation is neither in compliance with the aims presented in Master Plan nor with international standards. Serbian market has only recognised and recorded various types of accommodation establishments in rural tourism, such as: farms, ethno houses, salaš-farms, cabins, vajati- small yard houses, etc. without proceeding further. The challenge for Serbia in the following years is to adjust the regulations with the Master Plan aims as well as with international standards and to classify rural accommodation and criteria for their standardisation.

The comparison with the neighbouring countries: Categorisation in Romania is based on classification conducted by the authorities. Categorisation criteria are built upon the classification criteria established by World Tourist Organisation (UNWTO). Further elaboration refers to the size of rooms, safety and security standards and certificates that confirm the staff competence. Regulations in Romania recognised the following rural accommodation types: hostels, tourist complexes, apartments and rooms for rent, bungalow, cottage, camping, tourist village, a tourist stopover, apartments and camping (Foris, 2014). In Slovenia, Regulation on categorisation of hospitality establishments (Pravilnik o kategorizaciji nastavnitvenih obratov, Uradni list RS, št. 62/2008 in 72/2009) categorised the following types: hotels, motels, pensions, inns, camps, apartments – flats and houses for holiday, rooms, farms for accommodation and marinas. Slovenian law regulation differentiated farms as a special form of accommodation in rural tourism, which is not the case in Serbia. In Croatia, the facilities that according to Regulation on differentiation, categorisation and special standards of hospitality services in the group “Hotels” (National Newspaper No. 88/2007, 58/08, 62/09, 63/13, 33/14 and 92/14), fall within the mandatory categorisation group and are divided into the already existing facilities and new. Categorisation elements are specially prescribed for the existing, especially for the new facilities (Kosar, 2015). With regard to rural tourism, Croatia has advanced a lot in recognition of new types of accommodation and included them into the Regulation. Thus, Croatian regulation recognised: rooms in rural establishments, apartments, rural houses for holidays, camps in rural establishments, wine shop/wine tasting and excursion site (Regulation on changes and amendments on the regulations in hospitality services in rural establishments, (National Newspaper No. 138/06, 152/08, 43/09 and 88/10). In this sense, neighbouring countries may serve as the example for Serbia what direction to take and how to perform developmental and administrative activities.

Conclusion

Quintessential changes that have been accompanying the economic conditions in Serbia for a certain period (ownership transformation, market economy) impose serious demands onto the hospitality business that functions in technical-technological and organizational-staffing frameworks of various types and categories of accommodation facilities. The regulations on categorisation are a form of superstructure over minimum hospitality business standards, i.e. tourism. Categorisation and specialization are parallel processes that will be performed in the future in concordance with the prevailing market trends, i.e. modern technical-technological and organisational-staffing standards of quality. Consistent application of the standards is directed towards establishing quality and maintaining it, which would be the basic precondition for active participation of Serbia in international tourism trends. Dynamic approach to those processes means constant reconsideration and innovation, as the basic prerequisites for compliance with international standards in the EU countries. In this regard, it is estimated that rural tourism recognizes rural establishment as a new form of accommodation in rural tourism. However, this Regulation treats equally the rooms in spa resorts and rooms in rural establishments. Traditional establishment should be equipped in national and traditional style with all the details that make the offer original and authentic. Diversification of accommodation in rural tourism imposes the imperative of the recognition of new accommodation types and their inclusion into legal obligatory categorisation that will guarantee the proper quality to the guests. In the following years, Serbia need to adjust the regulations with the Master Plan aims as well as with international standards and to classify rural accommodation and criteria for their standardisation. Compared with the legislation in the countries of the region (Croatia, Slovenia, Romania), it is necessary to perform the specialization of accommodation facilities in rural tourism, to include them in the regulations, of course including all the traditional specifics that Serbia has.

Conflict of interests

The authors declare no conflict of interest.

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ECONOMIC EFFECTS OF IRRIGATION OF BASIC FIELD CROPS ON FAMILY FARMS

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ABSTRACT

The main objective of the research presented in this paper is to assess the economic impact of the application of irrigation in the production of basic field crops (maize, sunflower, soybean and sugar beet) on family farms operating in the South Banat area. Based on the data collected from the survey conducted on 75 family farms specialized in market oriented production without irrigation, using the method of models, calculation and comparison of the obtained results, an assessment was made of the economic impact of the application of irrigation in the production of basic field crops, as well as the assessment of their business performance. It has been established that the most significant economic impact from the application of irrigation in the production of basic field crops can be achieved on farms with 10-20 ha of arable land. Gross margins per hectare of arable land, depending on the type of soil prevailing in the holding, increased from 87% to 146%, while income per active member of the family farm dealing exclusively with agriculture could double.

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Introduction

Precipitation is the main source of water for both soil and plants. The major importance of precipitation for plants is in the vegetation period when they are especially vulnerable to water deficit. This period is called the critical period, and the lack of precipitation during this period reflects to a large extent on the yield level. The analysis of atmospheric precipitation in Vojvodina, in the period 1972 – 2011, carried out by Munćan. M. (2016) states that of the 40 examined years, 11 years were with an annual precipitation level of below 500 mm, 6 years with an annual sum of precipitation of 500-550 mm and 4 years under 600 mm. Despite the average 604 mm precipitation in Vojvodina, in the observed forty years, due to unfavourable distribution and strong evaporation, especially in the summer months, there is a lack of water required for field crop cultivation.

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The moisture deficit is especially pronounced in the summer months of July, August and September, when the air temperature is the highest, relative air humidity is the lowest, and evapotranspiration is very high. Considering that about 60% or about 370 mm of the average annual amount of precipitation in Vojvodina occurs in the period of vegetation (April-September), and taking into account that the total water requirements of field crops in this period, according to the research results of numerous authors (*Maksimović, Dragović, 2002; Glamočlija, 2004; Pejić, 2008; Tabaković, 2012; Bojović, 2014*) are as follows: wheat about 200 mm, maize 430-540, sunflower 350-500 mm, soybean 380-545 and sugar beet 560 mm, it can be concluded that the production of field crops in the area of Vojvodina is very much affected by the lack of water. Occasional droughts, such as those in 1973, 1983, 1988, 1990, 1993, 2000, 2002, and 2012, have inflicted heavy damage to agriculture. According to the data of the Statistical Office of the Republic of Serbia, in Vojvodina, year 2000 was characterized by the lowest annual precipitation of only 277 mm, of which only 143 mm during the vegetation period, the average yields were very low, amounting to: wheat 2.98 t/ha, maize 2.82 t/ha, sunflower 1.42 t/ha, soybean 1.15 t/ha and sugar beet 22.54 t/ha. In year 2012, the average wheat yield was 2.01 t/ha, maize 3.34 t/ha, sunflower 1.82 t/ha, soybean 1.52 t/ha and sugar beet 28.49 t/ha. By the correlation and regression analysis it was established that the application of mineral fertilizers and atmospheric precipitation during the vegetation period had statistically significant or very significant impact on the level of realized yields of basic field crops on the family farms in the Vojvodina region, in the period 1972-2011 year (*Munčan, 2016*).

The greatest share of field crop production in the Republic of Serbia is realized in the Vojvodina region. About 52% of the total area under cereals and over 92% of area under industrial plants are planted in this area (*Bošnjak, Rodić, 2010*). Family farms represent the most important carriers of the organization of field crop production in Vojvodina. According to the 2012 Agricultural Census, the number of these farms in Vojvodina amounted to 146,269, which makes 23.3% of the total number of holdings/farms in the Republic of Serbia. In the ownership structure of the farms in the Vojvodina region, farms of over 10 hectares make 21.5% of the total number of farms and utilize 77.5% of the arable land. The results of the Agricultural Census have directed the focus of these surveys on family farms of over 10 ha of size.

The subject of the research presented in this paper is the production of basic field crops with the use of irrigation on the family farms of Vojvodina. The main objective of the research is to assess the economic impact of irrigation in the production of basic field crops (wheat, maize, sunflower, soybean and sugar beet) on family farms of Vojvodina.

Starting from the subject matter, and taking into account the set goal of the research, the basic hypothesis of this work is: the application of irrigation can be used in the function of increasing the economic effects of the production of basic field crops and achieving better business results and operation performance of family farms.

Materials and methods

The data collected by the survey of 75 family farms, focusing exclusively on field crop production from the South Banat² area, was used as the primary data source. The South Banat region was put in the focus of this research because of the results of the 2012 Census of Agriculture showing that this area, in comparison with other areas of the Vojvodina region, it is characterized by the following: greater share in the total used agricultural and arable land, and in the total number of family holdings/farms; greater share of basic field crops in the sowing structure of the arable land of family farms and larger number of family farms of 10-100 ha and their share in the total volume of production of basic field crops of the region of Vojvodina. The survey of family farms focusing exclusively on field crop production in the South Banat area, in the period 2011-2014, was used as the material for this research. The survey covers family farms of 10-100 ha of arable land and five basic field crops (maize, wheat, sunflower, soybean and sugar beet), which are regarded as basic/essential because of the fact that, in the period of the survey 2011-2014, they represented on average annually 86% of the arable land of family farms of this area. All surveyed family farms, from the territory of the South Banat region, were classified according to the size of the area of used arable land in three range groups (10-20 ha, 20-50 ha and 50-100 ha).

Based on the representation of certain types, subtypes and soil varieties in the pedological map of Vojvodina (*Živković et al., 1972*), all surveyed family farms were classified in two variants:

- Variant I - family farms with prevalent soil of chernozem carbonate type on the wood panel (45 family farms surveyed);
- Variant II - family farms dominated by marsh smonitsa type soil (30 family farms surveyed).

When calculating the value indicators, the four-year (2011-2014) average prices realized by the surveyed family farms were used. Average prices were used in order to avoid the extreme effects of natural conditions on outputs achieved in certain years, as well as the annual fluctuations in the price of inputs and outputs resulting from distorted market relations.

The selection of research methodology has been harmonized with the subject of research on one and the volume and quality of data, on the other hand. Since research issues are primarily of an organizational and economic nature and that the subject of research is the organizational, i.e. the production system, on which experiments cannot be conducted, the general method applied in this paper was a modelling method. The models allow agricultural producers to analyse their current and expected situation

2 **Area** is a statistical functional territorial unit, established for the purposes of planning and implementing regional development policy, in accordance with the nomenclature of statistical territorial units at level 3, is not an administrative territorial unit and has no legal subjectivity; Law on Regional Development "Official Gazette of RS" No. 51/09.

in the future, gain a better insight into problems, find solutions to specific problems in the future and perceive their consequences so that they can act in accordance with possible alternatives, or make the right choice which, in their opinion, is the optimal for the given situation (*Todorović, 2008*). In addition to the method of model, the method of calculation and method of comparison of the achieved results were used for the estimation of the economic effects of the application of irrigation in the production of basic field crops, and the results of the research are presented in les and graphs.

Research results and discussions

Irrigation is a part of the complex modern agro-practice of cultivating agricultural plants and obtaining high yields. According to study by *Stojković, L.*, from year 1954, in Vojvodina, the irrigation eliminates the unfavourable effect of longer or shorter dry periods, and the crops are supplied with water to the optimal needs. In soil that is irrigated, organic matter decomposes faster, plant nutrients are activated faster and more intensively and are used to a greater extent by the crops, the weeds on irrigated soils develop faster and more efficiently, after irrigation, a surface soil layer is created, which contributes to some extent to the diminishing of the soil structure. Therefore, in the irrigation conditions, the intensive fertilization by mineral and organic fertilizers should compensate for the utilized nutrient reserves, which is confirmed by the results of numerous studies (*Babović et al., 2004; Grujančić et al., 2008; Maksimović et al., 2010*) according to which timely application of adequate quantities of mineral nutrients is necessary in order to achieve high, good quality, stable and economically justified yields of field crops by using irrigation. By frequent and impeccable cultivation, crops must be kept free of weeds, and the soil structure must be constantly repaired and maintained by proper basic treatment and appropriate crop rotation. If these settings are not sufficiently accounted for, after a few successful years, at the beginning of the application, the irrigation will lead to unintended consequences, that is, to the exhaustion of the soil and destruction of its structure.

The mentioned facts stipulated that when constructing a model of family farms, it was assumed that the maximum effects of soil utilization, genetic potential of cultivated plants and irrigation application can only be expected if an appropriate amount of mineral fertilizers was applied.

In Serbia, irrigation systems, according to the 2012 Census of Agriculture, covered 85,593 hectares of land, of which a total of 53,086 hectares were irrigated. The share of irrigated area in relation to the total agricultural land used in 2012 was around 1%, which is the lowest in Europe. The most common type of irrigation is irrigation by artificial rain. Of the total irrigated area, 93% is irrigated using the artificial rain, 1% is irrigated by superficial irrigation, and by drip irrigation 6% of the area. These statistical indicators have determined the selection of irrigation systems that will be used in the construction of models in this study. Namely, in order to construct a model of family farms that apply irrigation, the self-propelled rain cannon (typhoon) irrigation system was selected. This irrigation system, despite its high energy consumption per work

time, requires the lowest investment and is especially suitable for use on small plots (*Potkonjak, Mačkić, 2010*). By using a self-propelled rain cannon, in relation to the linear mobile system and the mobile rain wing, cultivated field crops give the highest yields, and the arrangement of the water sediment is most balanced (*Miodragović, 2009*). Based on the above said, as well as on the conditions in the field where the surveyed family farms operate, for each variant an irrigation system was designed.

The irrigation system in variant I consisted of a water catchment which involved digging and equipping wells (according to the experimental data collected on the surveyed area, the depth is about 50 meters), the installation of a primary pipeline with filtration (diesel pump, polyethylene hoses and a sand separator), the installation of a secondary pipeline (hydrant networks) and supply of water distributor (self-propelled rain cannon - typhoon). Total investment in such a system, including preparatory works (cleaning of the ground and marking of the pipeline route, earth and construction works), is amounted to 3,604,800 RSD (Table 1).

In variant II, the irrigation system is somewhat less expensive. In the immediate vicinity of the largest number of parcels, there is a built canal network for drainage and irrigation. As this system did not require digging and equipping wells, the total investment included: preparatory work, installation of a primary pipeline (diesel pump, polyethylene hoses), a secondary pipeline (hydrant networks) and the purchase of a water distributor (self-propelled rain cannon) and amounted to 3,058,800 RSD (Table 1).

Table 1. Investment in the irrigation systems

Elements and type of cost	Variant I	Variant II
Preparation works, RSD	15,300	15,300
Earth and concrete works, RSD	37,500	37,500
Water catchment – equipping, RSD	1,320,000	894,000
Main pipeline with filtration, RSD	192,000	72,000
Secondary system, RSD	240,000	240,000
Water distributor, RSD	1,800,000	1,800,000
Purchase value, RSD	3,604,800	3,058,800
Projected irrigation capacity, ha/year	20	20
Value of investment in RSD/ha	180,240	152,940
Planned life span, years	20	20
- Depreciation, RSD/ha per year	9,012	7,647
- Interest costs, RSD/ha per year	1,918	1,914
- Cost of investment maintenance, RSD/ha per year	600	600
Fixed costs, RSD/ha per year	11,530	10,161

Source: Calculation by the author based on data collected in the survey

The variable costs of using such dimensioned systems, for the projected system performance of 0.18 ha per hour, which include fuel, oil and lubricants for the diesel pump, the cost of operation of the tractor 20 kN for transportation and system setup (Table 2) are 194 RSD for 10,000 m³/ha (watering/irrigation standard 1mm/m²).

Table 2. Variable costs of using a self-propelled rain cannon (RSD per mm/m²)

Elements and type of cost	Per working hour			
	Unit	Quantity	Price (RSD)	Amount (RSD)
- The fuel for the pump	l	1.11	132	147
- Oil and lubricants	l	0.014	280	4
- Daily technical maintenance	h	0.014	300	4
- Tractor costs 20 kN	h	0.027	1,401	39
Variable costs				194

Source: Calculation by the author based on data collected in the survey

The analysis of atmospheric precipitation in the area of Vojvodina, in the period from 1972 to 2011, showed that the maize, sugar beet, soybean and, to some extent, sunflower crops are most often endangered by water deficit (*Table 3*). Wheat crop, both variants, cultivated on surveyed farms exclusively as winter crop, was supplied with sufficient amounts of water from atmospheric precipitation, especially in June, which was also registered as a month with the highest rainfall in the period of vegetation, (average precipitation in the observed forty year period was 87.4 mm/m²), so further research does not anticipate the use of irrigation.

Table 3. The requirements of field crops, average precipitation and water deficit in Vojvodina

Crop	Water requirement (mm/m ²) of plants in the period of vegetation	Average precipitation requirement (mm/m ²) in the period of vegetation (year 1972-2011)	Water requirement (mm/m ²) compensated by irrigation
Maize	490	370	120
Sunflower	450	370	80
Sugar beet	550	370	180
Soybean	470	370	100

Source: Calculation by the author based on previous research studies

Based on the identified water deficit and the projected variable costs of using the irrigation system and the surface of each crop in the structure of the sowing, the costs of irrigation of basic field crops on the surveyed family farms were calculated, according to the groups of farms, both variants (*Table 4*).

Table 4. Variable costs of irrigation of crops on different size of farm (RSD)

Crop	Size of the farm (ha), variant I			Size of the farm (ha), variant II		
	14.7	36.9	78.29	14.7	36.9	78.29
Maize	158,451	396,825	86,9452	124,298	277,173	492,546
Sunflower	57,773	115,237	282,541	28,034	85,498	202,130
Sugar beet	-	37,986	117,321	-	-	-
Soybean	-	-	-	65,634	157,986	417,425

Source: Calculation by the author based on data collected in the survey

The effects of irrigation of field crops

In order to assess the economic effects of irrigation, first the yields were evaluated based on the results of research by numerous authors (*Dragović, 1994; Maksimović, 1999; Dragović et al., 2001; Bošnjak, 2004; Maksimović et al., 2004; Bošnjak, Pejić, 2004; Dragović et al., 2005; Pejić et al., 2007; Pejić et al. 2010; Kresović et al., 2012; Pejić et al., 2012*). The calculation of the costs of irrigation of field crops was based on the estimated water deficit that should be compensated by irrigation and variable costs of using the self-propelled rain cannon.

The increased quantities of mineral fertilizers, due to the application of irrigation and the achievement of higher yields, were calculated based on the results of soil fertility analysis of the types represented and the recommendations of professional agricultural services for optimal use of mineral fertilizers.

Table 5. Changes in yield, variable costs and value of production of basic field crops on family farms by application of irrigation (variant I)

Indicators	Farm size (ha)								
	14.7			36.9			78.29		
	No irrigation	Irrigation	Difference	No irrigation	Irrigation	Difference	No irrigation	Irrigation	Difference
Yield (t/ha)									
Maize	7.42	12	4.58	7.76	12	4.24	8.03	12	3.97
Sunflower	2.48	4	1.52	2.73	4	1.27	2.86	4	1.14
Sugar beet	-	-	-	43.26	70	26.74	46.53	70	23.47
Variable costs (RSD/ha)									
Maize	69,412	108,914	39,502	53,751	90,644	36,893	51,288	88,226	36,938
Sunflower	54,340	78,437	24,097	40,171	62,308	22,137	37,126	59,162	22,036
Sugar beet	-	-	-	121,154	182,684	61,530	110,534	167,738	57,204
Production value (RSD/ha)									
Maize	115,752	187,200	71,448	121,056	187,200	66,144	125,268	187,200	61,932
Sunflower	86,800	140,000	53,200	95,550	140,000	44,450	100,100	140,000	39,900
Sugar beet	-	-	-	166,551	269,500	102,949	179,141	269,500	90,360

Source: Calculation by the author

The smallest family farms would have the most significant effects from the application of irrigation (*Table 5*). Namely, the yields and the value of maize and sunflower production on these farms of variant I would increase by 62% and 61%, respectively. In case of the largest family farms of variant I, this increase would be: in the production of maize 49%, sunflower 40% and sugar beet by about 50%. At the same time, in case of the farms of all sizes, variable costs would be significantly increased due to the application of irrigation and increased quantities of mineral fertilizers.

The value of the net effect of the production of basic field crops on commercial farms using irrigation calculated as the difference between the increased value of production and the increased variable costs is given in *Table 6*.

Table 6. The net effect from the application of irrigation of basic field crops on family farms (variant I)

Crop	Increased variable costs (RSD/ha)	Increased production value (RSD/ha)	Difference (RSD/ha)
Farm size, 14.7 ha			
Maize	39,502	71,448	31,946
Sunflower	24,097	53,200	29,103
Farm size, 36.9ha			
Maize	36,893	66,144	29,251
Sunflower	22,137	44,450	22,313
Sugar beet	61,530	102,949	41,419
Farm size, 78.29 ha			
Maize	36,938	61,932	24,994
Sunflower	22,036	39,900	17,864
Sugar beet	57,204	90,360	33,156

Source: Calculation by the author

The greatest net effect from the application of irrigation on crop cultivation was also realized on the smallest family farms, slightly less on farms of 20-50 ha, while the least effects were realized on the largest farms of the size of 50-100 ha.

Farms of the variant II were similar to variant I. The most significant effects of irrigation were realized on family farms of 10-20 ha, and the least effects on the farms of 50-100 ha (Table 7).

Table 7. Changes in yield, variable costs and value of production of basic field crops on family farms by application of irrigation (variant II)

Indicators	Farm size (ha)								
	14.7			36.9			78.29		
	No irrigation	Irrigation	Difference	No irrigation	Irrigation	Difference	No irrigation	Irrigation	Difference
Yield (t/ha)									
Maize	5.96	12	6.04	6.21	12	5.79	6.48	12	5.52
Sunflower	2.38	4	1.62	2.42	4	1.58	2.61	4	1.39
Soybean	2.58	4	1.42	2.83	4	1.17	3.18	4	0.82
Variable costs (RSD/ha)									
Maize	69,586	110,608	41,022	55,676	91,329	35,653	51,745	86,611	34,866
Sunflower	60,951	85,542	24,591	45,287	68,053	22,766	42,532	63,504	20,972
Soybean	65,775	89,477	23,702	116,030	71,024	22,270	41,869	63,790	21,921
Production value (RSD/ha)									
Maize	92,976	187,200	94,224	96,876	187,200	90,324	101,088	187,200	86,112
Sunflower	83,300	140,000	56,700	84,700	140,000	55,300	91,350	140,000	48,650
Soybean	105,780	164,000	58,220	48,754	164,000	47,970	130,380	164,000	33,620

Source: Calculation by the author

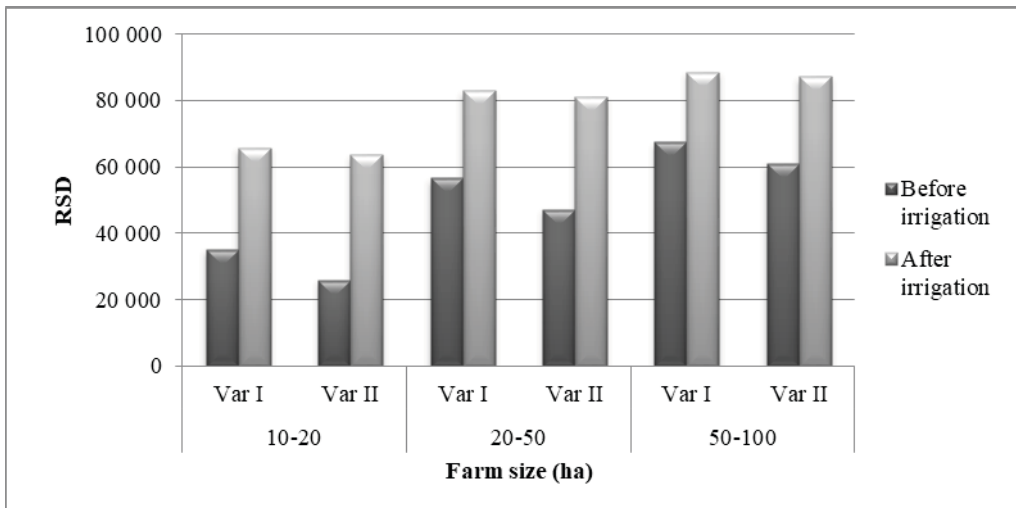
The calculated net effect of intensifying the production of basic field crops (Table 8) showed that the application of irrigation was fully economically justified in all groups of farms of variant II.

Table 8. The net effect from the application of irrigation of basic field crops on family farms (variant II)

Crop	Increased variable costs (RSD/ha)	Increased production value (RSD/ha)	Difference (RSD/ha)
Farm size, 14.7 ha			
Maize	41,022	94,224	53,202
Sunflower	24,591	56,700	32,109
Soybean	23,702	58,220	34,518
Farm size, 36.9ha			
Maize	35,653	90,324	54,671
Sunflower	22,766	55,300	32,534
Soybean	22,270	47,970	25,700
Farm size, 78.29 ha			
Maize	34,866	86,112	51,246
Sunflower	20,972	48,650	27,678
Soybean	21,921	33,620	11,699

Source: Calculation by the author

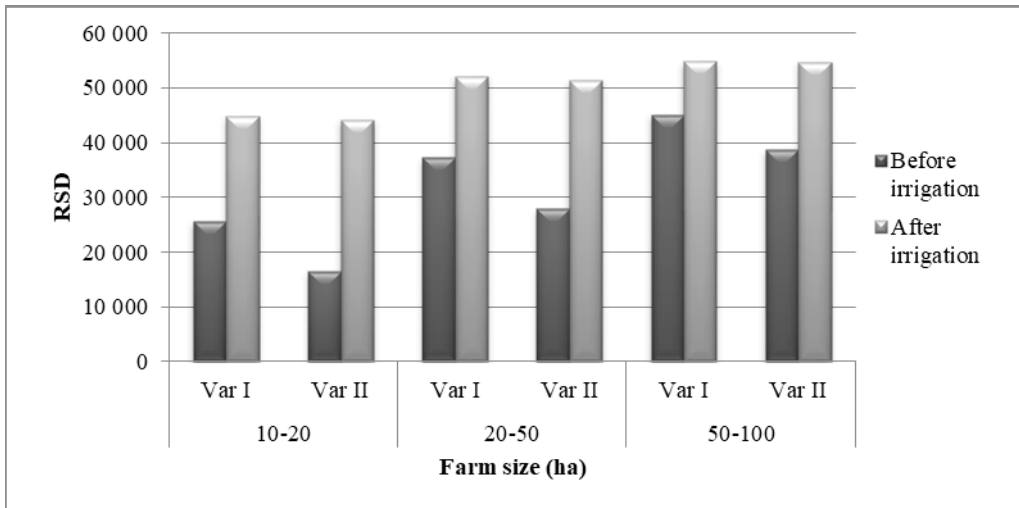
The most significant increase in the gross margin per hectare of arable land by application of irrigation in the production of basic field crops was realized on the smallest family farms, in case of variant I it was 87%, and variant II, this increase was 146%. Contrary to small farms, a significantly higher level of intensity, which was realized on farms of 50-100 ha, recorded significantly lower effects from the application of these measures - 32% for farms of variant I and 43% for variant II (*Figure 1*).

Figure 1. Gross margin per hectare of surveyed farms before and after the application of irrigation

Source: Calculation by the author

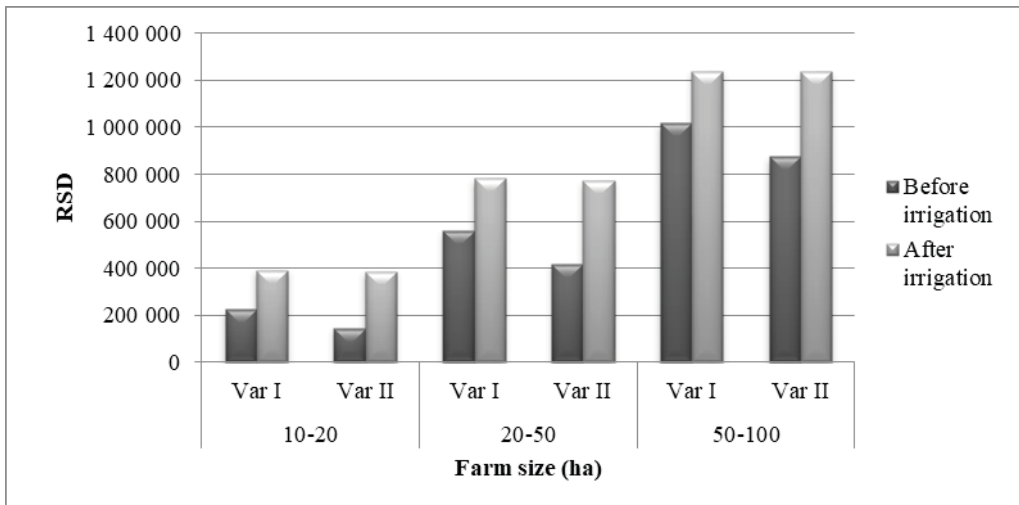
The impact of irrigation expressed in terms of income per unit of area and by an active member of the household engaged exclusively in agriculture resulted in an increase of 74% on the smallest family farms of variant I and more than two and a half times on the smallest farms of variant II. On the largest family farms, the application of irrigation showed moderate increase of these indicators, especially in case of farms of the variant I - 21%, while in case of farms of the variant II this increase was 41% (Figure 2, Figure 3).

Figure 2. Income per hectare of surveyed farms, before and after application of irrigation



Source: Calculation by the author

Figure 3. Income per active member of the surveyed farms before and after application of irrigation



Source: Calculation by the author

Conclusion

The derived economic indicators fully confirmed the initial hypothesis that the application of irrigation can be successfully used in the function of increasing the economic effects of the production of basic field crops and achieving better operating results of the family farm business. Considering that the smallest family farms (size 10-20 ha), due to their economic strength and technical equipment, apply a significantly lower level of intensity in the production of basic field crops, compared to family farms of 50-100 ha, the greater possibilities for increasing the economic effects from the application of irrigation were recorded on these farms. Namely, by applying irrigation on family farms size of 10-20 ha, the yield of maize would increase from 62% to 101%, while the sunflower yield would increase from 61% to 70% depending on the type of soil. Also, the gross margin of these farms would increase from 87% to 146%, while the income per active member of the farm operating exclusively in agriculture could increase from 74% to 102%.

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Conflict of interests

The authors declare no conflict of interest.

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MANAGING AGRICULTURAL COMPANY BY USING INTERNAL CONTROL AND SIGNIFICANCE OF RISK PRESENTATION

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ABSTRACT

The survival of a company on the market is possible if there is a good company managing, led by agile and professional management. Company development is a general objective and it can be achieved if the management of the company managed to establish their own style of organization and management. In addition to the aforesaid, the management should have a developed system of internal control within the regular and continuous business operations.

Our contribution is reflected in the presentation of mode of managing nursery-garden plant production, using internal control for the benefits of management.

We found that the application of detected risks in said production could be presented and illustrated in a range of risks, all of it with the aim of making management decisions that will reduce the overall risk of an agricultural company's business operations.

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Introduction

Company management should aim to create the most optimal system of managing the company. Therefore, in well-managed companies the executors at all levels try to maintain their skills and knowledge and to ensure the flow of information, and the management does their best to support them. That way it is achieved the interaction of the managerial and executive functions in the company (Popović at al. 2014).

In recent decades in the EU countries many efforts were made to unify the standards of reporting, but there is still no generally accepted model for the implementation of unified and normative expressed control functions in a company. One of the most important factors of standardization in the EU is also the application of International Financial Reporting Standards; majority of companies have adapted to the new requirements, as well as regulatory bodies and institutions, but certainly investors and stock exchanges as well (Guiggiola, 2010). In these subjects, besides the application of standardization, there should exist also the control of conducting procedures at all levels, both in private companies and in companies that rely on the budget in their operations.

Internal control in most companies is built into the management function of the company. According to the COSO (Committee of Sponsoring Organizations of the Tread way Commission) internal control is “inherent in the way that management runs business” (COSO, 1992).

Internal controls present a process that is modified by the highest management authority, e.g. supervisory board of the company. The most commonly management initiates prescribing of guidelines for the activity of internal auditors, in order to obtain a reasonable insurance regarding the achievement of objectives in the following fields: improving efficiency of decision-making by management, increasing the reliability of financial reporting, keeping compliance with applicable laws and the protection of property (Lynch, 2007). Implementation of internal control standards require: professional attitude, competence and professional care, competence, skills and other competencies, needed to perform said tasks (Galloway, 2010). Aforesaid corps of international standards enables better information and transparency in economic and financial communication. Applying optimal internal controls should lead the company to the level of tolerable risk, built by the system of control functions (Cantino, 2009).

Some authors raised the fundamental issues that are not of the importance at first glance for the analysis of control functions, such as whether the rate of profit in all sectors is the basic motive of behavior. In addition, it should be noted that the professionalization of activity breaks autarchy of production companies and affect the connection to global society (Popović, 2014).

As soon as the company's assets are discussed, even in the context of internal audit, there is another important issue, and that is the issue of the market value of corporate assets. In the developed countries that issue is placed in the center of research, because when liabilities are subtracted from the total assets and divided by the number of outstanding shares, the result is a net asset value per share.

Company management combines various procedures in managing the company and they are conditioned and very dependent on the IT systems of companies (Fletcher, 2003). Planning is the primary phase of the management process in which decisions are made, depending on the strategies, policies and plans (Williams, 2010). Business operations can be seen as process, as well as measurable activities, designed to produce specific results for specific customers (Davenport, 1993).

View of management reporting can be seen in many ways. If there is about financial reporting, as one of the most outstanding reporting issue related to business, it should include the factor of time in which it is done. It should be noted that the assumption of the financial statements, limitlessness of time of business operations, e.g. the primary goal is that the company will continue in business for the foreseeable future (Greuning, 2006).

Financial statements should be prepared in conformity with generally accepted accounting principles or other rules (Soltani, 2009). At the end of this chapter, it is necessary to point out that the proper reporting of all parts of the company is the basis of the quality of company management.

Materials and methods

The aim of this study is to show to professionals and the public in a practical relevant example the importance of the use of internal control in agricultural companies. In addition to this primary objective, which was in the focus of research, the authors researched and presented the possible risks in the form of systematized basic impacts on business operations, primarily agricultural companies in the Republic of Serbia.

The possible application of the presented risks for agricultural companies can be applied in the production of plant and animal species, but also in agricultural and other production of the agricultural sector. The example can be applied to a large number of agricultural companies in the Republic of Serbia, but it does not exclude the application in other countries, primarily the countries from the region of former Yugoslavia. Application with some modification is possible in developed countries, because the presented risks are universal.

The subject of the research presented in this study is managing of an agricultural company by using internal controls and mechanisms in the context of a very specific production of perennial deciduous plants in the nursery garden. The research covered the period from 2015 to 2017, in a particular company that is the second largest in the Republic of Serbia and that belongs to the public utility sector carrying out predominantly agricultural activities.

The study included research of six types of plant species that are produced and sold by the nursery production company. Name of the company is not explicitly stated, because the company did not consent to publishing the name of the company; the authors were allowed to publish and present research results to wider scientific and public in general. The research was conducted in a specific agricultural company. In fact it is a public

utility company with a predominant agricultural activity, which was founded by the City of Novi Sad. The specificity of the company is reflected in the fact that all goods, presented in this research, the company produces and sells to a known customer, i.e. the City of Novi Sad.

Results

The authors by dynamic analysis analyzed the show of the plant nursery production of perennial deciduous trees in the period 2015-2017. The aim of this dynamic approach to the analysis is to determine the potential risk from sold pieces of plants and their values for this period of research. In this paper performed dynamic analysis was on three levels. The first level was to determine group index species sold in pieces in 2015. The second level was to determine group index values per plant species for 2016 using average method (Laspeyres) and the third level referred to the analysis of planned price for the initial year in this paper, i.e. 2015.

Using the available literature in which presentations of theoretical approaches to these three levels are given (Račić & Savković, 1999), as well as the works of authors who suggest modeling of reducing uncertainty (Krejči & Houška, 2012), authors in Table 1 showed the scheme of the movement of sold plants nursery production, i.e. the values same for the period 2015-2017.

Table 1. Overview of trends of the sold plants nursery production in pieces and their values at planned prices for the period 2012-2014

No	Name of species	Species sold in pieces			Value per plant species recorded in the planned prices in €		
		Year of observation			Realized value per plant species recorded in the planned prices in €		
		2015	2016	2017	2015	2016	2017
		q_1	q_2	q_0	w_1	w_2	w_0
1	Sorbus scandica	14	34	0	94,06	228.43	0
2	Platanus acefifolia	551	382	0	3701,92	2566.49	0
3	Aesculus hippocastanum	41	243	21	275,46	1632.61	141.09
4	Liriodendrum tulipifera	5	5	0	24,95	24.95	0
5	Prinus pissardi	63	174	125	314,34	868.17	623.68
6	Quercus rubra pyramidalis	31	232	137	154,67	1157.56	683.56
Total		705	1070	283	4.565,4	6.478,2	1.448,3

Source: author's own research.

a) The first level dynamic approach authors presented by the group index sold all six species of plant nursery in pieces in 2015, (Račić & Savković, 1999), noting that the base year is 2017. Symbols are represented:

$q_1 - q_0$ = the observation 2015-2017,

w_1, w_0 = value species,

$$I_w = \frac{\sum q_1 p_1}{\sum q_0 p_0} \quad (1)$$

$$I_w = \frac{\sum w_1}{\sum w_0} = \frac{4565,40}{1448,33} = 3,152 \quad (2)$$

$$I_{w(2012)} = 315,20\%$$

Based on display *sold all six species of plant nursery* in 2015 compared to 2017, expressed by planned prices in €, it can be concluded that the production volume was higher for 215.20%, compared to the base year of observation, i.e. 2017.

b) The second level dynamic analysis the authors presented by the group index values of all six species of nursery production per plant species for 2016, noting that the base year of observation is 2017. This was done by using the method of average (Laspeyres), based on (Račić and Savković, 1999). The authors performed the calculation on the basis of the expression:

$$I_q^{(0)} = \frac{\sum \frac{q_2}{q_0} w_0}{\sum w_0} \quad (3)$$

$$I_q^{(0)} = \frac{6478,20}{1448,33} \quad (4)$$

$$I_q^{(0)} = 4.4728$$

Based on the display of *the sale of all six species of plant nursery* in 2016 compared to 2017, it is concluded that the volume of production and in this case also the value of the plant nursery production was higher for 347.28%.

c) Group price index has specificity in the model that the authors did, because prices in the period 2015-2017 have been planned and have not been changed in all three years of observation. Tabular presentation is shown in Table 2.

Table 2. Plant nursery production of six species of perennial sawmills in the period 2015-2017. year at the prices and quantities

No	Name	q_1	q_2	q_0	$p_1=p_2=p_0$	q_0p_1	q_1p_0	p_0q_2	p_2q_0
1	look at the note	14	34	0	6,7	0,00	94,08	0,00	0,00
2		551	382	0	6,7	0,00	3702,7	0,00	0,00
3		41	243	21	6,7	141,12	275,52	1633,0	141,12
4		5	5	0	4,9	0,00	24,95	24,95	0,00
5		63	174	125	4,9	623,75	314,37	868,26	623,75
6		31	232	137	4,9	683,63	154,69	1157,6	683,63
Total		705	1070	283		1.449	4.566	3.684	1.449

Note: plant species nursery production per column 2 “is the name of plant species”, clarification on that plant species in order to: (1= Sorbus scandica, 2= Platanus acefifolia, 3= Aesculus hippocastanum, 4= Liriodendrum tulipifera, 5= Prinus pissardi, 6= Quercus rubra pyramidalis)

Source: author’s own research.

In this particular case, observation of the author that is relayed on the group price index (Pashed), has the specifics that are applied to the entire observation period 2015-2017, because in this period, prices are planned and the same or have not changed. The permanence of the price or the immutability has a result about 1, or 100% of the immutability price for the entire observation period 2015-2017. As far as the price, the risk is small but not the sold quantity as a result of the economic activities of enterprises.

After dynamic analysis, that reporting is useful for management, but imprecise. It can be used only for a short analysis and as a guideline in future analysing, which will be developed in a systematic detection of risks causes to the company’s operations.

After presenting the displays related to the production in the period from 2015 to 2017, which served as a relevant framework for making some basic conclusions such as:

- That there are great oscillations in the quantity of produced products in each year of monitoring,
- Planned prices have not changed for the entire period of monitoring of company production
- Despite the previously stated conclusion there is a fact that in the last year of monitoring three species were not produced and sold at all, or 50% of plant species were not generally produced, but could be sold to a known buyer,
- The production in 2016 compared to 2015 is 65% higher, and in 2017 it decreased by 3.78 times compared to 2015.

This approach to organization and management of nursery production by a concrete company in Serbia is extremely negative and we can say that it is an example from

which we should learn, because the company obviously does not have internal control functions or the mechanisms through which the management could see and bring valid decisions. This statement authors supported by the conclusion that in Serbia there are about 500 companies that are public, and these companies have been established by local and national government. Internal controls are not developed in such companies.

Comparing this situation with the EU countries, the authors point out that in the EU countries there are constant efforts to find solutions to unfavorable economic and financial situation in which local authorities are. One of these solutions is the adoption of a mechanism for restructuring local public services, with the aim of reducing costs by which the fiscal burden will be reduced (José L. Zafra-Gómez et al., 2014). We can see the different efforts to improve management, such as those that turn the observation examination the relevance of ownership and top management in the context of efforts implementation to corporate social responsibility (José-Luis Godos-Díez et al., 2014).

There are authors who point to a large number of heterogeneous and different factors influence on the revision of the enterprises (Duréndez & Mate, 2012), but we cannot ignore the essence, ie. one must always bear in mind that recognizes the basis of the audit (Hayes, R. et al. 2005), in order to make as few mistakes (Mercedes M. et al., 2015). The mentioned opinions that are related to the audit should be taken into account especially when important decisions are being made, such as those related to management (Aaker, 1991), investments (Bodie, Z. et al., 2009) and branding (Anholt, 2007). Next imposed must be considered from the point of existence of enterprises in the conditions of economic crisis (Xu, Y. et al. 2011).

One of these solutions, which often emphasize the internal control of public and other companies, is the acknowledgment of international accounting standards (IAS) in the ordinary course of business and management reporting. IAS that is particularly important for the management of enterprises, especially those that are appropriate for the full implementation of these standards is the application of IAS-16, which essentially means the appropriation and application of the fair value, as well as IFRS-8, which still more invigorate assurance that management has implemented IAS and IFRS in its operations. In addition a number of authors point out that the firm size affects that the company opts for full implementation, in particular IFRS-8 (Pablo F. & Ricardo, R. 2015).

For these reasons, and because there are many companies that do not have control mechanisms, the authors tried to explore the basic risks, which the management will accept as a mechanism to force the organizers of production to lead them and apply in management reporting. Most companies in the last phase control conducted audits, which we see in a number of authors such as (Popović et al. 2015; Gritsenko and Skorba, 2015; Panchuk, P., 2015; Skrypnyk and Vygivska, 2015).

Identification of important risk is closer associated with the attempts of standardization and unification of risk. Only their overall knowledge will enable their proper evaluation and quality implementation of the modern risk management at company level. In order to successfully operate, it is important that there is harmonized internal control in the

company. The aim of all activities undertaken by the company in this respect is to reduce a large number of risks in the company's operations.

In this paper, an overview of selected risk factors (some) is given, while emphasizing that the authors have presented a possible risk interval (1-7), with the aim of a comprehensive consideration of risk factors, which have to be analyzed and categorized according to the degree of influence on the operations of the company.

Thus at the end of a given display research in Table 3 the total obtained nominally pronounced risks to the company is presented. Using expert literature (Popović et al. 2014, a) as a framework, the authors of this study created and presented original tabular presentation review the risk factors in form of Table 3. The obtained results are genuine and verifiable and refer to the mentioned company specifically.

Table 3. Display of overview of selected risk factors affecting the company

Risk Factor	Description	Terms of value shown risk to the company's operations	Possible risk interval to a concrete company
General factors of influence			
Number of days of illiquidity in the past 12 months	More than 120 days in the blockade in 2013.	5	1-7
Debt Indicators (the ratio of total loans and equity)	The tendency of permanent deterioration of credit and capital ratio	6	1-7
Profitability indicators (the ratio between net profit and operating income)	The realized loss within last three years, with tendency to get increased	7	1-7
Activity influence on risk assessment			
Public Utility Companies'	Research conducted in a Public Utility Company	1	1-7
Farming Sector	The Company operates predominantly in the field of agriculture	5	1-7
Activity influence on risk assessment			
Designed mechanism for internal audit	The lack of a defined system of internal control and audit by management	5	1-7
Existing obligation to adjust the accounting policy	No accountancy obligation to track costs and maintenance costs and to adjust them to the bookkeeping value of the assets that the company operates with	7	1-7
Total risk		36	

Source: author's own research.

Discussions

The authors tried in the study to identify and present only the basic heterogeneous impacts on business operations of the company, with a primary objective to decrease risks in the future. This is extremely important in the segment of business operations of the state and state, i.e. public companies, from one very important reason, which is that those organizations operate with public funds, or funds of taxpayers.

It was pointed out in the article that the internal controls should be adjusted to circumstances, primarily those related to the company. Besides accepting the “circumstances”, the risks should be taken into account, in order to have as real as possible opinions on internal controls in the medium and long term. Audit findings should be timely and presented in a clear form of reporting to management and state administration. That makes possible taking adequate activities, primarily by the management of public companies.

Application of internal audits of business operations, carried out in the company, may achieve much bigger benefits in comparison to the potential costs that may arise as a result of internal control, internal audits and audits of the companies that apply them.

All aforesaid can tell us that effective internal control system should possess characteristics of establishing standards, measures of realized success, should analyze and compare the results achieved in relation to the standards, and take into account the program of corrective actions and analyzes and revises the standards. The authors made this study public for the purpose of considering a company with the specific indicators, which did not implement internal control into their business operations.

In addition to the shown in the study, there is a triple view of potential risks to the company’s operations, as follows:

- General factors of influence,
- The impact of the activities and
- Display of the internal factors of the company.

Conclusions

On the basis of results obtained and presented by the authors of the paper, it can be concluded that the implementation of internal controls in agricultural enterprises is of utmost importance for enterprise management. Enterprise management has at its disposal different mechanisms enabling improvement in enterprise management. The authors point out the importance of presenting corporate risk factors numerically within risk intervals for the relevant risk. The recommendation would be immediate implementation of internal controls in the company.

In addition to the basic idea that would have been presented to management, there is a second one to establish periodic and annual monitoring and comparing the situations before and after the introduction of controls, after the implementation of internal controls.

Audit in the public sector presents an important link in the chain of responsibility, since it strengthens responsibility, both in terms of selected or appointed officials, and in terms of beneficiaries, taxpayers and citizens. Internal control is an independent and objective evaluating and consulting activity designed to “increase value” and improve the company’s operations. The legal basis for internal control of this type of companies in Serbia is the Law on the Budget System of the Republic of Serbia.

Using internal control provides a systematic and disciplined evaluation, valuation and risk management. That improves control and allows company managing with reduced level of risk within the normal course of business. Citizens rightly expect state authorities to use public funds only justified and appropriate, and in the most efficient way, which is accepted through the legal responsibility that the management of such companies has.

The authors analyzed in the study a segment of nursery plant production of the public utility company, founded by the City of Novi Sad, but noting that the main activity of the company is agriculture. The significance of this study is the universality of application in other parts of the company, but also in other companies, regardless of the ownership structure of the company. Similar studies from other countries would be desirable to be introduced with the purpose that professional public can have a broader basis, primarily in the field of defining the heterogeneous risk factors to the business of agricultural and other companies.

Conflict of interests

The authors declare no conflict of interest.

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NATURAL RESOURCES PROTECTION STRATEGIES IMPORTANT FOR AGRICULTURE IN THE INTERNATIONAL COMMUNITY AND REPUBLIC OF SERBIA

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ABSTRACT

Agriculture as an economic activity depends heavily on living organisms and ecosystems for its vulnerability of nature and therefore the environment has become a common global problems of the modern world. International legislation in the field of environmental protection has not yet reached the level that would allow a peaceful life for all people and all living creatures on our planet. During this research various methods of scientific research were used in the breakdown of complex categories, methods of specialization and after synthesis elaboration, different conclusions were formed. On the basis of the aim of this paper, the methods are chosen which by their combination enable the quality realization of the research.

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Introduction

The high threat to nature and the environment becomes part of the common problems of contemporary civilization. As a process of modern times, urbanization manifests itself through the increasing role of cities in human life, in terms of population concentration, urban and economic functions that become the paradigm of human life created by the social-spatial forms of habitation. Forms of environmental degradation constitute a complex process that contains the phenomena and events that occur from the behavior of a person or the use of technological systems. Namely, these forms are not only the result of urbanization and industrialization, but are primarily present in the disregard of ecological environmental laws, poor spatial and urban planning, including the susceptibility to a long array of risks (Mijatović, Cvijanović & Stajkovac, 2011).

There is an impressive range of evidence demonstrating the agricultural impact on the environment, confirming a serious extent of damage to ecological infrastructure, including species extinctions, top soil loss, water scarcity, deforestation, air pollution, acid rain, green house effect, ozone hole, collapsing fisheries, bio-invasions and increasing infectious disease. The industrial agriculture system consumes fossil fuel, water, and topsoil at unsustainable rates. It contributes to numerous forms of environmental degradation, including air and water pollution, soil depletion, diminishing biodiversity, and fish die-offs (Altieri, 2004).

Pollution and contamination are concepts that need to be distinguished from one another, because pollution includes qualitative and quantitative changes in the physical, chemical and biological properties of primary life components (air, water, soil, food, etc.) and pollution, which is the current cross-section of the condition caused by the previous process and which has its duration. One of the functions of the state is the preservation and protection of nature, the activity of professional institutions, the obligations and freedom of civic action and behavior, aimed at preserving biodiversity, geo-heritage (geodiversity) and landscape with its aesthetic characteristics, natural and cultural contents. (Nešković, 2007).

Materials and methods

The research is supported by knowledge and results from scientific and professional literature, that is, the findings and scientific results of numerous professional authors who have studied the issues of this work in their books and articles. In this research, we specifically deal with agriculture as an economic activity that largely depends on the environmental protection and ecosystems due to its productivity and sustainability.

During this research, techniques of classifying different data through literature review, as well as the method of description and generalization, have been applied. Using the descriptive method, we present the results that were obtained by looking at the effects of the initiated process of protection of important national resources in our country. The comparative method was inevitable in the writing of this research paper and it will show similarities and differences between global standards in protection of national resources within agricultural systems and state of environmental protection in the Republic of Serbia.

Results

The main result of this research is the identification of the process of environmental protection and national resources protection strategy of the Republic of Serbia, its scope, possibilities, as well as the effects of the previous implementation of the mechanisms of protection of natural resources in our country. This particular research is trying to determine the capacity in the field of protection of rare natural resources, as well as further necessary steps in improving the environmental protection system. This research paper represents an attempt to raise awareness of the protection and conservation of natural resources, the application of appropriate national and international instruments and mechanisms, as well as a better understanding of the concept of environmental protection in Serbia.

World organizations for environmental protection

WWF - The World's Nature Conservation Fund is a global independent nature conservation foundation that was established in 1961, in Gland, Switzerland. The task of WWF is to stop the degradation of the natural environment and to build a future where people will live in harmony with nature.

EUROPARC Federation was founded in 1973 under the official title „Federation of Nature Parks and National Parks of Europe“ and since then it has grown into a recognized, professional organization of European protected areas. The EUROPARC Federation gathers a wide array of organizations and individuals engaged in vision of policy and park management and protected areas throughout European continent. Modern international diplomacy in the field of environment began in 1972 at the UN Conference on Human Environment in Stockholm.

The World Summit on Sustainable Development (WSSD) was held in Johannesburg, which reaffirmed sustainable development as a central contender on the international agenda and gave a further impetus to protecting the environment and world efforts to combat poverty. Protected areas are very important for several reasons: Providing the necessary benefits from the nature that sustain the human life; Housing of people with traditional cultures and providing irreplaceable knowledge of nature; Helping to preserve the diversity of ecosystems, genetic variability of species and ecological flows necessary for life; Enormous educational, spiritual, scientific, cultural and recreational values; Protected areas have important values as the representatives of the world wilderness (nature), as a cultural and landscape value of significance; Potential models of sustainability of resources that can be applied anywhere in the world (Cvijanović, Simonović, Mihailović, 2011).

History of environmental protection in Republic of Serbia

The legal protection of nature in Republic of Serbia began in the 14th century - Dušan's Code (The Law of Tsar Dušan The Mighty) from 1349, where the prohibition of logging was pointed out but also established obligation of planting at the places where the forest was cut down. Despot Stefan Lazarević, in 1412, passed the laws on ores that regulated the ownership, procedure and conditions of use of mineral raw materials. Obed Swamp is the first area that has been placed under protection in the territory of modern Serbia. It was a strict protection by Baron Mollinary in 1874. (Mijatović, Cvijanović, Stajkovic 2011). From natural assets, first protected in Serbia, was the reserve of evergreen trees, tertiary relic, called „Zeleničje“ on the Oštrozub mountain near Crna Trava, protected by a decision of the Ministry of Forestry in 1948 at the proposal of the Natural History Museum from Belgrade. As for the national parks, the Fruška Gora National Park was declared the first national park in Serbia in 1960.

International Strategies for Environmental Protection

Expansion and intensification of cultivation are among the predominant global changes of this century. Intensification of agriculture by use of high-yielding crop varieties, fertilization, irrigation, and pesticides has contributed substantially to the tremendous increases in food production over the past 50 years. The use of ecologically based management strategies can increase the sustainability of agricultural production while reducing off-site consequences (Marković, Njegovan, Pejanović, 2012). The process of urbanization has brought many benefits to man: technological development, economic

and commercial progress, however, some of the consequences are: pollution of air and water, accumulation of various waste, the destruction of the ozone layer, global warming of the planet followed by climate change.

The European Landscape Convention of The Council of Europe - Starting from the fact that the diversity and quality, as well as the cultural and natural values of European landscapes represent a common resource, European countries have adopted the European Landscape Convention in 2000, in Florence, Italy. The aim of this convention is to manage, protect and plan all types of European areas, whether rural, degraded, urban or of exceptional beauty, through the introduction of measures at the national level and cooperation at the European level.

International Convention for the Protection of Birds - In 1950, the Convention for the Protection of Birds was adopted and therefore regulated the protection of birds, at the time of nesting and during migration. This Convention is the forerunner of the Ramsar Convention, as it also establishes the obligation to form reserves in aquatic and wetlands in order to ensure the necessary conditions for feeding birds and their nesting.

Ramsar Convention - In Iran, in the city of Ramsar, in 1971, the Convention on Wetlands of International Importance, especially as a birdwatch habitat, was adopted. This Convention refers to the basic ecological functions of the swamp, as a regulator of the water regime and as habitats of specific flora and fauna, in particular the swamp birds.

The Washington Convention - The provisions of this Convention apply to live or dead plants and animals as well as their parts or products made from them. The convention was adopted in 1973 in Washington DC and is an international agreement providing international cooperation in the protection of certain species of wild flora and fauna against excessive exploitation through international commerce.

Convention Concerning the Protection of the World Cultural and Natural Heritage - This Convention was adopted in 1972 and aims to identify, protect and preserve the natural and cultural heritage worldwide, which it considers to be of paramount importance to mankind.

Berne Convention - In 1979, in Bern, a convention was adopted to protect the European wildlife and natural habitats in order to preserve wild fauna and flora and their habitats, especially those habitats and species whose conservation requires the cooperation of several states and the promotion Such cooperation. This convention envisages that each country forms a network of protected natural assets (Stevanović, 2000).

Man and Biosphere (MAB) - Human and natural harmony is the basis of the program “Man and Biosphere”, which existed since 1971 within UNESCO. These reserves are crucial for achieving a sustainable balance between conflicting conservation objectives of biodiversity, the preservation of cultural values and the promotion of economic development. The EuroMAB network was established in 1987 and covers 30 countries in Europe and North America.

Bonn Convention - In Bonn, on June 23, 1979, the Convention on the Conservation of Migratory Species of Wild Animals was adopted. It constitutes an international agreement created by care for those species that migrate outside national borders, that is, accepting that states must be protectors of migratory animal species living within the limits of their jurisdiction.

Natura 2000 - Areas of Natura 2000 are ecological areas in which they want to preserve and achieve favorable conditions for the lives of birds and other animal species, their habitat types and habitat preserved in the interests of the European community. The Natura 2000 network consists of two types of areas: Areas under special protection and Special areas of conservation. Biological diversity at the European level is processed in biogeographical regions.

Parks for Life: An Action Plan for the Protected Areas of Europe - One of the most important „International Union for Conservation of Nature“ (IUCN) projects in Europe since 1994 is the implementation of the action plan for protected areas called „Parks for Life“, which has been prepared and implemented in cooperation with the EUROPARC Federation (Nešković, 2012). The basis of the plan consists of about thirty priority projects, of which the Institute for Nature Conservation of Serbia has allocated five and has chosen to implement them, as the most acceptable for our protected areas, namely.

European Centre for Nature Conservation (ECNC) - The pan-European 2020 Strategy for Biodiversity and its Action plan, which established the Pan-European ecological network, was supported in 1995 by the European ministers for environment protection.

European Green Belt Initiative - In 2004, together with its partners, the International Union for Conservation of Nature launched the Green Belt of Europe initiative in order to create an ecological network from Barents to the Black Sea. The aim of the initiative is to encourage cross-border nature conservation and sustainable development.

The Seville Strategy on Biosphere reserves - UNESCO organized an International Conference of Experts in Seville in Spain in March 1995. The strategy developed there, known as the “Seville Strategy”, recommends taking the necessary steps for the future development of the Biosphere reserve in the 21st century.

State of protection and conservation of national resources in Serbia

In proportion to the size and direction of the provision of the territory, our country is characterized by great genetic, species and ecosystem diversity. It is therefore classified as one of the most important biodiversity regions in Europe. 40% of the plant species of the entire European flora grow in the territory of Serbia, while the representation of birds and mammals is about 70%. On the basis of international criteria, the territory of Serbia, together with territory of Bulgaria, is classified into one of six European and one hundred and sixty world centers of biodiversity. However, due to industrial development and population growth, 50 plant species have irretrievably disappeared, and around 120 have been severely endangered, and agricultural development in Vojvodina has changed the

vegetation. The development of agriculture, urbanism, tourism, as well as illicit trade in plant and animal species have led to disruption of the biodiversity in Serbia. Agriculture's main challenge for the coming decades will be to produce sufficient food and fiber for a growing global population at an acceptable environmental cost.

Serbia is distinguished by its rich and varied natural heritage, which is reflected in a wide spectrum of geological, geomorphological, palaeological, climatic, hydrological and biological diversity. The total area of protected natural resources in Serbia is around 516,350 ha, or 6.59% of the territory. In addition to five national parks, the remaining protected natural resources in Serbia include: 98 nature reserves, 16 landscapes of exceptional features, 296 nature monuments and 24 nature parks. Under the protection of the state there are a total of 215 plant and 426 animal species as natural rarities. Apart from the national parks that have been placed under the protection of the state as a natural good of great importance: Kopaonik, Tara, Đerdap, Fruška Gora and Šarplanina (Mijatović, Cvijanović, Stajkovic 2011).

The impact of the changed environment on living beings is reflected in the change of biochemical processes, metabolism, growth and development, physiology, which can endanger the health and life of people, as well as other groups of organisms. As an element of nature that has a pronounced geological, biological, ecosystem diversity, protected natural assets are very important, especially in the urban environment.

Within the "MAB-Man and Biosfere" project, Serbian government proposed NP "Tara", Upper Morava and Drina Biosphere Reserve. The areas of Labudovo okno and Upper Danube would be protected under the Ramsar Convention (The Convention on Wetlands of International Importance, as a regulator of the water regime and habitats of characteristic flora and fauna). The Institute has also identified 35 bird areas that meet the criteria of the IBA project (evaluation of areas of importance for birds), sponsored by Bird Life International. In our country, 13 areas of international significance for butterflies have been identified. Pančičeva omorika, which can be found exclusively on Mountain Tara, is an endemic and relict specie, a descendant of species that in Europe, during the tertiary period before the Ice Age. Due to the specific conditions on the Balkan Peninsula, omorika could be considered, as a representative of the extinct vegetation. Regarding the reservation, 71 nature reserves, totaling 84,000 ha, have been declared in Serbia so far. On the surface of more than 100 hectares, there are special nature reserves: Ludoš Lake, Upper Danube, Karadorđevo, Stari Begej-Carska Swamp, Kovilj-Petrovaradin Marches, Zasavica, Deliblato Sands, Obed Swamp, Mustafa-Feljana, the Gorge of the river Resava, the Gorge of the river Uvac etc. Zasavica is protected as a special nature reserve. So far, over 600 plant species have been recorded in this area.

In the first degree of protection, which makes the smallest area within the national park, all activities except scientific and research activities are strictly forbidden. In the protective zone of the National Park Tara, based on the latest research of the Institute, natural values were valorized, resulting in the proclamation of Šargan-Mokra Gora for a landscape of exceptional features and proposals to protect the Zaovine area with the Gorge of the river Rzav.

As the unique professional institution for nature protection in our country, the Institute has proposed ten areas for biosphere reserves. The Serbian Ministry of Environmental Protection operates the Commission for Cooperation with UNESCO, within the framework of the MAB (Man nad Biosfere) committee, to which the Institute proposes a preliminary list. Within the framework of the MAB-UNESCO project „Man and Biosphere“, in 2001, Nature Park Golija was registered in the list of biosphere reserves. In addition to Nature Park Golija, the other nine nominated areas are: Đerdap, Tara and Šar Mountains, Special Nature Reserves Upper Danube, Obed Swamp and Deliblato Sands, Stara Planina, Kučaj Mountains and Prokletije. In Serbia, there are 35 areas important for birds that meet the IBA criteria (BirdLife International). Four protected natural assets in Serbia were registered at the so-called Ramsar list (Mijatović, Cvijanović, Stajkovic, 2011).

Protected national resources in Republic of Serbia

The territory of Serbia, as well as the entire Balkan Peninsula, is distinguished by the extraordinary natural resources and diversity of the living world that places this area in one of the most important centers of biodiversity in Europe. Serbia occupies only 2.1% of the European continent and on its territory lives: 74% of birds of Europe, 67% of European mammals, 51% of European fish fauna, 49% of fauna of reptiles and amphibians of Europe and 9% of Europe's vascular flora.

So far, about 44,200 plants, animals and mushrooms have been officially registered in Serbia. Much of the biodiversity in Serbia is part of the protected natural areas, especially the National Parks. National parks provide one of the highest, integral forms of nature protection based on an ecological concept that plant and animal species, their populations, biocenoses and ecosystems can be protected most effectively through the complete protection of their natural habitats (so-called in-situ conservation of biodiversity).

National Park „Đerdap”

National Park „Đerdap” was founded in 1974. It is located in northeast Serbia, on the border with Romania. Đerdap is the largest National Park, it covers an area of 64,000 ha. The park is located on the right bank of the Danube and extends from Golubac to Karataš (near Kladovo) i about 100 kilometers long. It covers a narrow forested mountain and mountain belt along the Danube, which rises from 50 to 800 meters above sea level. The main natural phenomenon of the area is the Đerdap Gorge of the Danube, the longest and largest peak of the breakwater in Europe, about 150 km long. The narrowest part of the gorge, where the Danube is the deepest, known as the „Great Kazan”, is at the same time the most attractive part of the whole area. In the Đerdap area there are over 50 different types of forest and shrub communities today, of which 35 are a relic. In Đerdap there are a total of 150 species of birds, 57 species of fish, 49 species of mammals, including 6 species of bats, of which 3 species are on the European red list and 17 species of rodents. Within the national park, 8 nature reserves and one area of exceptional qualities were declared (Veliki i Mali Štrbac).

Because of its border status, the National Park „Đerdap“ is planned to be included with its natural whole in Romania Parcul Natural Portile de Fier in the Network of border areas, and due to its outstanding cultural and historical monuments and preserved autochthonous nature it is proposed to be included in the UNESCO World Heritage List and into the world network of biosphere reserves through the program „Man and Biosphere“.

The international community brings many documents with the aim of protecting and sustainable development of natural resources such as Đerdap, and on the national plane, accompanying documents are being prepared in accordance with international standards. The experiences of developed countries indicate that effective action is by reasoned pressure on polluters, which results in the fact that they take measures to minimize pollution at the prescribed permissible limits (Mijatović, Cvijanović, Stajkovac 2011).

National Park „Šar-planina“

National Park „Šar-planina“ (Šar Mountain) is the „youngest“ national park in Serbia, founded in 1986 and covers part of the northern side of the Šar-planina mountain range (in the southwestern part of Kosovo and Metohija). It covers an area of 39,000 ha. Šar-planina is a typical highland area with 30 peaks over 2500 m high and even 100 peaks over 2000 m. The highest peak is Bistra at 2,661 m above sea level. In Šarplanina, traces of ice age are present at almost every step with a whole series of glacial cirque and lakes.

Šar-planina is one of the most important centers of biodiversity in the Balkan Peninsula. With about 2000 species of vascular plants, this mountain covers about 56% of Serbia's flora. The Animal World of the National Park Šar-planina is characterized by exceptional diversity. There are 147 species of butterflies, over 200 registered bird species and 32 different species of mammala. The bearded vulture disappeared from Šar-planina, which until recently was his last refuge in Serbia. The lynx in the National Park enjoys special protection within the „Special Zoological Reserve on Rusenica“. Because of the exceptional natural values and numerous cultural and historical monuments, the National Park Šar-planina is proposed for international protection through UNESCO's World Natural and Cultural Heritage Program and „Man and Biosphere“.

National park „Fruška Gora“

National park „Fruška Gora“ is oldest national park in Republic of Serbia, declared in 1960. It is located in the southeastern part of the Pannonian Basin (between Danube and Sava), occupying an area of over 25,000 ha, which includes the entire forest – mountain wreath of Fruška Gora. The highest peak is the Crveni Čot of 539 m.

Although small in space and height (with features of mountain relief), Fruška Gora is distinguished in geological terms by the presence of different types of rocks, as well as the chemical and mineralogical composition.

Fruška Gora is distinguished by the great diversity of the plant world. There are 32 species of fern, of which 6 species are on the list of strictly protected flora. About 1000 species

of vascular plants grow in the National Park area, and the total number of 1450 taxa in the whole area of Fruška Gora represents more than 1/3 of the total flora of Serbia. 73 species are on the list of strictly protected. The basic type of vegetation on Fruška Gora is the deciduous forest. Fruška Gora is home to about 500 medicinal and potentially medicinal plant species. In the area of the park there are as many as 16 Orthodox monasteries dating from the late 15th and early 16th centuries, up to 18th century.

National Park „Tara“

National park „Tara“ was founded in 1981. It is located in the west part of Serbia. It covers an area of 19,200 hectares. Tara mountain represents a surface of 1000 to 1200 m high, with its rising peaks from 1400 to 1600 m above sea level, sprinkled with river valleys. In addition to the canyon valley of the Drina with powerful limestone sections high and over 1000 m, there are the canyons of rivers Raca, Brusnica, Derventa and White Rzav.

There are 171 species of moss in the Tara area, 30 species of ferns, 7 species of gymnosperms, 950 marshmallows, altogether over 1100 species, representing 1/3 of the total flora of Serbia. Tara was proclaimed National Park primarily because it is one of the most forested mountains in Europe, with some forest complexes being one of the most well-preserved and most productive in Europe. Forest ecosystems occupy about 70% of its total territory. Pančić's omorika develops in very different habitats, on rocks or on crevices, mixing with different types of hardwoods and softwoods. At the same time, other communities of trees, and even individual, are protected by law as natural rarities. Of the pure coniferous forests of the National Park Tara, there are especially important forests of black pine, white pine forest, and various mixed forests.

There are 280 medicinal and aromatic plants on Tara, and for this reason, measures have been taken to plant this species on the Tara mountain, which has proved to be very successful, thus protecting natural populations. The animal world of Tara National Park is very diverse, with 115 species of butterflies, 27 species of fish, 12 species of amphibians, 12 species of reptiles, about 170 bird species and 51 species of mammals. Especially significant and legally protected are brown bear, chives and roe deer. Bearing in mind all the natural values and specificities of this area, an initiative has been launched to place the National Park Tara in the list of World Natural and Cultural Heritage, to be included in the network of biosphere reserves (UNESCO) and in the network of border areas under the name „Drina“.

National Park „Kopaonik“

National Park Kopaonik was protected in 1981 and covers an area of roughly 11,809 ha. It extends to the highest and most preserved parts of the mountain Kopaonik, which rises in the central part of southern Serbia. The base of the park is a highland, relatively rugged area of medium height above sea-level of about 1700 m. The lowest point is about 640 m, while the highest point represents Pančićev vrh (Pančić's Peak) at a height of 2017

m. Kopaonik is a mountain of extremely complex geological structure. There are 219 mushroom species in the Kopaonik area, 120 species of lichens, 350 species of algae, about 150 species of moss, and even 1600 species of vascular plants. The presence of 825 species and subspecies of vascular plants has been recorded from this exceptionally high diversity of flora for the highland area above 1600 m above sea level. Today in the National Park Kopaonik there are 91 endemic and 82 subendemic species, which suggests that Kopaonik is one of the most important centers of endemism in Serbia.

In the Kopaonik area there are 14 species of amphibians, 13 species of reptiles, 148 bird species and about 60 species of mammals. However, only the highest parts of the mountain, perhaps because of the crude nature, have been preserved until recently. Today, through these forests, there are many kilometers of ski slopes and lifts that make the threat to the living world maximized. Many species have disappeared, a dozen of them are in direct danger, and a hundred very rare plant species can easily become endangered and completely disappear from this area. Kopaonik's problems include illegal construction, wastewater and municipal waste. If all these problems are not solved before long, there is a great chance for Kopaonik to lose its status as a National Park.

National Strategy for Approximation of Environment of the Republic of Serbia

National Strategy for Approximation of Environment of the Republic of Serbia (2010) was prepared in close cooperation with the Ministry of Environment, Mining and Spatial Planning and the Ministry of Agriculture, Forestry and Water Management, Ministry of Infrastructure, Ministry of Finance, Office for European Integration of the Republic of Serbia and representatives of the Autonomous Province of Vojvodina. Support for the preparation of this Strategy was also provided through technical assistance funded by the European Union through the Instrument for Pre-Accession Assistance (IPA), and implemented by Eptisa Servicios de Ingeniería S.L. from Spain and Project Management Ltd. from Ireland.

Over the past decade, great progress has been made in improving environmental protection in Republic of Serbia, but much remains to be done. For example, while in the EU almost 90% of wastewater is treated before discharge, and almost 100% of municipal waste is collected, in Serbia only 10% of wastewater is treated before discharge, and only 60% of municipal waste is collected. In addition to this, solid municipal waste collected in large quantities must be disposed of in landfills that do not adequately protect the environment or public health. Less than 15% of municipal solid waste collected in Serbia is deposited in landfills that meet EU standards, unlike the average in the EU where it is 99%. Likewise, while 40% of municipal solid waste is recycled in the EU, this rate is only 4% in Serbia.

The latest enlargement of the European Union shows the complexity involved in creating the conditions for full compliance with the EU environmental regulations - especially in the situation where the current environmental protection in our country is lagging behind in the EU. In order to overcome this challenge, there is a need for sustainable

progress in three specific areas: the transposition of EU environmental regulations into national regulations, the establishment of administrative capacities for the implementation of environmental regulations, monitoring and implementation of these regulations, and the establishment of the infrastructure necessary for implementation of these regulations. In the current institutional structure of the Government of the Republic of Serbia, successful implementation will require the improvement of the current inter-ministerial channels of cooperation (Nešković, 2012).

Conclusions

Humanity is confronted with a multitude of existential crises, among which the ecological crisis takes a special place. So far, man has been unable to create an ideal system of civilization and avoid the crisis situations of that system. Ecological awareness represents the necessary basis for further, sustainable development of environmental protection. The strategic approach of Serbia includes all relevant entities of the state, especially economic diplomats who represent and affirm serbian national, primarily economic resources on the international plane (Nešković, 2012).

In the 21st century, society faces the following global problems: damaging the biosphere and its ecosystems, a huge population - over 6 billion with a doubling projection by 2020, exhaustion and reduced volumes of many sources of mineral and energy raw materials, pollution and degradation of air, water and land, global climate change, destroyed species of plant and animal life and further endangering biodiversity, human health, large amounts of waste in all three aggregate states, and so on. The survival of human communities has been often endangered in the past by natural disasters, epidemics, wars, food scarcity and other influences which, however, have always been spatially limited. Unlike the existential crises of the past, today's crises do not come from natural disasters that are spatially restricted, but from global discrepancies in the conceptual and material purport of the industrial civilization.

So far, man has been unable to create an ideal system of civilization and avoid the crisis situations of that system. For now, there are no integral system studies that would clarify the true dimensions of these problems as well as the real possibilities for their solution. The ideas of a consumer society have one single goal: to produce large quantities of products that are cheaper, regardless of the applied technologies, i.e. the harmful consequences they have on the environment and which lead to more pollution. The survival of many plant and animal species is endangered today, many are found to be fading away, and many have disappeared forever.

Agriculture depends heavily on natural resources for inputs, for example, water, soil and fertilizers and is often at the same time in competition with other industries. If the amount of natural resources available to agriculture falls either because agriculture uses natural resources insustainably or because other industries do this, agricultural production will fail to be maintained. In addition, agriculture, other industries and households use natural environment as sinks for disposal of their wastes. Such disposal

can reduce the amount or quality of resources available for agricultural production and so result in lack of sustainability of agricultural production. In relation to agricultural development, it can support the view that conservation of the natural resource-base of agriculture is not so important because erosion of this base can be compensated for by increased human investment and technological progress. Agronomists must embrace ecology and ecologists need to become more involved in thinking about agricultural systems. Both must be willing to work with economists and other social scientists to appropriately identify services that can be valued.

Conflict of interests

The authors declare no conflict of interest.

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APPLICATION OF THE PRINCIPLES OF CORPORATE GOVERNANCE IN AGRICULTURE COOPERATIVES

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ABSTRACT

The principles of corporate governance in the global economies and in the process of globalization are recognized and stated as extremely important, first in the successful business of companies and gaining competitiveness on the market, and then in the successful resolution of possible conflicts and conflicts of different interest groups within the companies themselves. However, can corporate governance principles be applied in agricultural cooperatives, which now, more than ever, require a good organization, the structure of the rules on which they will be more organized on the market and represent the interests of their cooperatives? By analyzing the cooperative sector, it's been attempted to integrate the principles of corporate governance, with the functioning of agricultural cooperatives, their basic values, organization, traditional organization, etc. in a way that they do not stand one against the other, but one in the function of the other, as a mutual complement.

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Introduction

The transition period in Serbia and in the surrounding countries takes almost thirty years, as much as the fundamental changes in the socio-economic environment and the transition from one mode of economics system, socialist, to other - capitalist. Corporate governance in these economies has a crucial character, that is, in the case of recapital transition ie in the case of the recapital transition (Josifidis, 2004).

During the transition period in the Republic of Serbia there was no significant change in the economic structure. Since the beginning of the 21st century, the

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contribution of agriculture to gross domestic product has declined, primarily as a result of faster growth in activities in non-productive sectors (primarily trade). However, the share of agriculture in the structure of gross value added (GVA) of the economy of the Republic of Serbia is still very high. Compared to the average of the EU countries (27 Member States), the Republic of Serbia has a significantly higher share of GVA of the agriculture sector in total GVA, and significantly lower participation of the service sector. The high share of agriculture in the basic macroeconomic aggregates of the Republic of Serbia in relation to other countries can, on the one hand, be attributed to rich natural resources and favorable climatic conditions for agricultural production, and on the other hand slower to the process of structural reforming of the rest of the economy and delays in that process.

Table 1. Macroeconomic indicators of the contribution of agriculture to the national economy

	2010	2011	2012	2013
GVA of agriculture, forestry, hunting and fishing (in millions of RSD)	245.128	292.191	279.126	344.32
Share of GVA of agriculture in total GVA (%)	9.9	10.5	9.7	11.4
Employment in agriculture, forestry, hunting and fishing	533	478.1	467.1	492
Share of agriculture in total employment (%)	22.2	21.2	21	21.3
Export of agricultural food products (in millions of euros)	1700	1956	2131	2104
Participation of agriculture in total exports of goods (%)	23	23.2	24.1	23.4

Source: The Strategy of Agriculture and Rural Development of the Republic of Serbia for the period of 2014-2014.

If this result of the share of agriculture in the gross domestic product is linked to the gross added value of this sector with the state obligation to create an institutional framework for better functioning of agriculture, how is it possible that the cooperative sector in Serbia is left out of the focus of these new institutional and economic reforms? If the previous one is added the fact that the agricultural activity is still carried out through crushed agricultural holdings, which without association can not achieve adequate competitiveness on the market, then the state's need to stimulate the development of cooperatives in agriculture is a clear and absolutely necessary. In the National Agriculture and Rural Development Strategy of the Republic of Serbia for the period 2014-2024 ("Official Gazette of RS" No. 85/14), problems and challenges that are followed by agricultural legislation in Serbia have been identified. Namely, it has been established that transition political solutions have not sufficiently taken into account the specificities of the cooperative sector and that in that sense a radical reform of the agricultural legislation is necessary. The main problem is:

Agricultural cooperatives in the Republic of Serbia, besides using their own capacities, organize production on agricultural holdings of about 31 thousand cooperatives and cooperate with about 100 thousand cooperators. It is estimated that agricultural holdings, which are covered by some kind of cooperation with the cooperative, have about half

of the cattle stock and agricultural land. The nature of the business relationship of cooperatives and agricultural producers is such that agricultural cooperatives finance initial investments for cooperatives and subcontractors, which practically take up the double risk: as suppliers of raw materials on the one hand, and as creditors in settling obligations towards suppliers, on the other.

The period from 2000 to 2013 is characterized by an accelerated process of privatization of social capital and the implementation of a series of systemic reforms, mostly bypassing agricultural cooperatives. Farming cooperatives were exempted from the privatization process, which was supposed to give them additional incentives for strengthening and development.

However, the unresolved problem of property-legal relations, an inequitable approach the capital market and the devastating effects of the gray economy have affected the slowdown the reform of the cooperative movement. Under the influence of these movements, the identity of cooperative property and trust in the cooperative system was lost. Until today no uniform mechanisms for monitoring the situation in the cooperative sector have been established and no ministry has precise and reliable data on the situation in this sector. Cooperative sector support programs that have been provided by individual ministries over the past years have been ad hoc, incompatible with each other and systematically unregulated. Some of the key problems that paralyze the more efficient transformation of the cooperative sector are:

- 1) unresolved property-legal relations and the issue of cooperative property as a collective type of private property;
- 2) that the agricultural cooperatives in the Republic of Serbia do not have their own processing facilities, which would be particularly useful in the processing of milk and meat, fruits and vegetables, industrial plants, confectionery industry and others. Therefore cooperatives are excluded from the market of final food products and do not appear in that part of the food chain. In addition, a good part of the storage capacities in the meantime is technically and technologically obsolete due to lack of investments in the maintenance and innovation of equipment;
- 3) that farmers' cooperatives have been faced with a difficult access to the capital market for (too)long, and in this respect they are in a more unfavorable position than small and medium-sized legal entities and long-standing participants;
- 4) that co-operatives for a longer period were not users of current and development incentives of MAFWE for their own production. In 2011, agricultural cooperatives for the first time since 2004 could use milk premiums and premiums for genetic improvement in livestock production for their own production, under the same conditions as agricultural holdings of natural persons and economic entities with majority state capital. Only from 2013, agricultural cooperatives robbled to use direct incentives for registered co-ownership;

- 5) that the existing systematic solutions of other ministries do not recognize the specifics of agricultural cooperatives and do not provide specific solutions to help their revitalization;
- 6) that cross-sectoral cooperation is underdeveloped and reduced to a large extent in cooperatives in a narrower local environment. Loaded by the existential problems cooperatives completely ignored the segment of interdepartmental cooperation, as well as the concern for human resources and their strengthening. The number of existing production associations of all kinds is extremely high, especially in primary agricultural production. Producer associations are poorly developed, and their role and activities are small. Most of the producer associations are at a low level of organization, which, first of all, marks a low level of professionalism and a lack of management personnel. In recent years, associations have become more and more visible, in particular, in the situations where a market has emerged, but their bargaining power is generally low due to high dependence on the processing industry.

So, the Strategy as one of the problems, states a low degree of professionalism and a lack of management personnel, low negotiating power, and so on. After the adoption of the aforementioned Strategy, a new Law on Cooperatives was adopted in the Republic of Serbia, which was supposed to solve the observed robbery at the institutional level.

On the basis of this, it is very easy to notice the need to apply the basic principles of corporate governance in agricultural cooperatives, which could further improve agricultural cooperatives.

Materials and methods

Agricultural cooperatives, as a form of association, have a long history and specific values that determine their significance, both through history, and in contemporary conditions, where their values are recognized, both in raising the competitiveness of domestic production and improving the negotiating position of agricultural producers of associated in cooperatives (Vukoje & Zekić, 2010), and so in determining the prices of agricultural products on the market (Vignjević – Đorđević et al, 2015). Precisely in the conditions of market economy instability and frequent crises, corporate governance principles should contribute to reducing the risk to equity holders, which can at the same time mean reducing the risk to cooperatives through multiple decision-making controls. This should be added to the mentioned share of agricultural production in the total gross of domestic product, in order to gain a true picture of the importance of a well organized system of agricultural cooperatives in our country.

In the theoretical part of the paper, the method of theoretical analysis of contents was primarily applied with the sociological, historical and comparative method, normatively dogmatic method, than basic methods of concretization and specialization, while statistical and analytical-deductive methods were used in the research part of the paper.

The research is based on official statistical data of Statistical Office of the Republic of Serbia, data of Agency for Business Registers and data of Chamber of Commerce of the Republic of Serbia.

Results

Since the mid-19th century, the first forms of cooperative organization have been created in Europe, primarily craftsmen, and then farmers.

The first cooperative in the world was founded in Rochdale, England, in 1844 (Rochdale weavers) and it was a modern consumer co-operative, whose foundation marked the beginning of a new era of contemporary association (Tomić et al., 2017).

In the theory of the cooperative movement, several types of cooperative organization can be distinguished, however, three basic directions have also influenced the cooperative organization in our area:

1. **The Rochdale model** - formed in England after the strike of 1833, which implied free entry and exit from the cooperative, the equality of all cooperatives regardless of the number of subscribed shares - the “one man - one vote” principle, the division of profit according to the scope of purchase, the payment in cash, political neutrality, limited interest in the share capital/
2. **The Raiffeisen model**, formed in Germany in 1848 at a time of great winter hunger - in order to provide the poor layers of the population with basic foods. As early as 1854, the first credit union was founded - the self-help of the cooperatives in a limited territory, entering into a cooperative without a share, solidarity and unlimited liability, bringing the surplus profits into an indivisible cooperative reserve fund, operating exclusively with cooperatives and free exercise of office.
3. **The Schulze-Delic’s model** of cooperative organization, which was also formed in Germany in 1849, when a deputy of the Prussian Parliament founded a sick and mortar treasury, shoe and table joint-stock cooperatives, and in 1850 a credit union. This way of organization involved a large number of cooperatives, the complete exclusion of state aid, the creation of a reserve fund that can be shared, the attraction of capital through rewards, solidarity and limited liability and business specialization (<http://www.zssrbije.org/istorija-zadrugarstva.html>).

The first co-operative (agricultural credit union) in the territory of today’s Serbia was founded in today’s Backi Petrovac, in 1846 and it was also the third cooperative founded in the world (Tomić et al., 2017).

The first cooperatives established certain principles of cooperative society, which later became permanent principles of the work of consumer cooperatives in general, such as: the principle of self-help, the principle of democracy, the principle of neutrality, the principle of profit distribution, the principle of selling for cash, the principle of selling at liquid drinks prices,

Table 2. Important years in the Serbian co-operative society

Year	Happening
1895	The Main Association of Serbian Agricultural Cooperatives was established in Smederevo
1897	The Association of Serbian Agricultural Cooperatives based in Zagreb was founded
1989	Decree on promulgation of the Law on Agricultural and Craft Cooperatives
1900	There were more than 650 cooperatives in Serbia
1923	The main alliance merged with the Alliance in Zagreb, after which a total of 1962 a.c.
1937	The Law on Economic Co-operatives has been adopted
1946	The Constitution emphasized the role and significance of the general and peasants' early cooperatives
1949	The Basic Law on Agricultural Cooperatives has been adopted
1953	Reorganization of peasant work cooperatives
1957-1965	Period of relatively successful development of co-operatives
1974	The SFRY Constitution
1976	The Law on Associated Labor has been adopted, with which the cooperatives are abolished
1989	Return to co-operatives and reinstatement of cooperative property by the 1988 Constitution
1990	The new Law on Cooperatives has been adopted
1996	Regulation of property - legal status of cooperative property
2015	The law on cooperatives adopted

Source: Tomić, 2017.

The agricultural cooperative, as a model of interest-based association of farmers, is not an end in itself, but a means of achieving the goals of its members-associates who are “working together” in order to achieve better results working on family farms.

According to The National Agriculture and Rural Development Strategy of the Republic of Serbia, adopted in 2012, on the initiative of the Society of Agricultural Economists of Serbia, the cooperative acts as a generator of economic development of agriculture in several directions:

1. pretends to become the main entrepreneurial form through which Serbian farmers will constantly improve their economic situation;
2. in cooperation with the cooperative, the easiest way for farmers to transfer traditional agriculture to modern ones is by purchasing inputs through a cooperative at the most favorable prices and receive expert instructions on how to use them;
3. gathering small farmers of cooperatives as an economic service for cooperatives, through marketing information, directs cooperatives to a production structure that delivers optimal results, helping them find where and when to sell their products at the best price;

4. working with the cooperative according to the “model of contracted production”, a higher employment of household members in family farms is achieved, resulting in their economic strengthening through the realization of higher incomes;
5. in the market conditions, the cooperative must verify its competitiveness, and by performing its economic functions in the name and for the account of the cooperative, it strengthens the market position of family farms, which provides them with more efficient business;
6. the cooperative contributes to the stabilization of economic trends and the reduction of the gray economy, resulting in higher tax revenues, the reduction of illegal business and the reduction of unfair competition;
7. by forming cooperative enterprises in the manufacturing industry, cooperatives enable their members to become owners of a recognizable cooperative product of greater added value;
8. the cooperative reduces the economic stratification of the population in the transition process in a more just way because cooperative farmers can help one another (http://portal.zzbaco.com/mojo_baco/Data/Sites/1/daes_brosura_strategija.pdf).

However, this Strategy has never been adopted by the National Assembly as a strategic document, but based on the allegations in it, the reform of the co-operative society in Serbia was adopted and a new Law on Cooperatives in 2015 (“Official Gazette of the Republic of Serbia” No. 112/2015) was adopted, in which the basic concepts related to cooperatives are defined, the basic principles of cooperatives are determined and the legal position of the cooperatives on the market is determined. The law stipulates that the cooperative is a legal entity, as a special form of association of natural persons, which is a special form of organization of physical persons (hereinafter referred to as “a cooperative member”) that realizes its economic, social, cultural and other interests by operating on cooperative principles, and that manages and controls the operations of the cooperative.

(Article 2 of the Law on Cooperatives). From the very definition of the term cooperative law, several conclusions can be drawn. First of all, a cooperative is designated as a legal entity, which acquires its subjectivity by registering it in the prescribed register (the Business Registers Agency). Therefore, by registering in the prescribed register cooperatives can on its own perform on the market in its own name and for its own account, independently of the cooperative - the individual who established it. This definition of a cooperative is very important because the same rules apply on other legal entities (Bulatović et al., 2016), and the individual will and interests of the cooperative founder must be transformed into a general or joint interest, through a cooperative as a legal entity.

Bearing in mind that there are about 1 600 active agricultural cooperatives in Serbia, and that there are 30-40 cooperatives on average, there can be conflicts of interest that exist in other legal forms of companies (limited liability company and joint-stock company). (<http://pretraga2.apr.gov.rs/ObjedinjenePretrage/Search/Search>). These conflicts primarily arise from the conflicts of individual and common interests, ie of general interests (Škorić, 2010). The specificity of conflicts of different interests of a cooperative arises from the basic principles of cooperative society, which co-operatives put in a special group of economic organization.

The Law on Cooperatives regulates the way of organizing cooperatives, i.e. management of a cooperative, cooperative bodies, decision making, etc. (Article 33-52 of the Law on Cooperatives). Co-operatives manage a cooperative on the principle of “one cooperative - one vote” in the assembly of the cooperatives, while the cooperative bodies are: the assembly, the board of directors, the supervisory board and the director. The issues regarding the responsibility of the members of the cooperative bodies, which are not resolved by this law, are subject to the provisions of the Law on Business Companies, which concern special duties towards the company (“Official Gazette of the Republic of Serbia” No. 36/2011, 99/2011, 83/2014 - Dr. Law and 5/2015). In this regard, one could imagine situations in which the determination of the responsibility of the cooperatives would be necessary, as well as the review of the decisions made by the shareholders assembly, etc. (Mirković & Maričić, 2017).

On the basis of all the above, the challenges and problems of the agricultural cooperatives in Serbia so far, and on the basis of the beginning of the reform of the cooperative sector, conditioned by the problems identified that require urgent resolution, one can find a place for applying the principles of corporate governance as a way of making business decisions in cooperatives, which would contribute to the further and faster development of the agricultural cooperatives in Serbia.

Discussions

Corporate governance, as a way of thinking, appeared almost a century before the term officially began to be used, so the idea of corporate governance is actually older, but in theory and practice it is stated as new. He even has the opinion that corporate governance was created at the same time as the forms of organization in which there is a conflict between those who invest money and capital and those who manage it (Jovanović & Grujić, 2016).

Corporate governance is a set of clearly defined rules and processes that regulate the system of relationships between different stakeholders in the company and beyond, all with the aim of implementing strategic decisions, ensuring long-term growth and development of companies and increasing the wealth of shareholders (Vučković & Vučković, 2016). The development of the concept of corporate governance is based on a number of theories, of which the most dominant “agency theory,” which separates the ownership and management functions of the company analytically, and this refers

to the complex relationship between shareholders and managers, which results in the emergence of information asymmetry (Jensen & Meckling, 1976).

Corporate governance involves a set of mechanisms that by adjusting and aligning contribute to the introduction and improvement of the rule of law for the company. Developed countries were in the 60s and 70s (when privatization came to their notice) showed great interest in synthesizing and solving corporate governance issues. The success of the privatization was conditioned by the state-of-the-art model of good corporate governance provided through the legal and institutional framework of the state with the aim of serving the developed countries in fighting corruption from the point of view of companies (that is, microeconomic entities) and for strengthening the economy as a whole from a macroeconomic point of view (through strengthening and expanding companies outside the framework of the domestic economy) (Đorđević, 2004, p. 196). Their goal is to establish a corporate governance practice that ensures the protection of shareholders and investors against misuse of the board. Different economic trends in market economies have led to the emergence of several types of capitalism (Josifidis, 2004):

1. Market-oriented capitalism characteristic for the US, UK and Canada,
2. Rhineland or corporative capitalism characteristic for Germany and Japan,
3. State capitalism recognizable in France and Italy and
4. Social democratic capitalism characteristic of Sweden and Austria

Crystallized types of capitalism, together with the administrative and legal environment, the cultural and historical development of countries and the increasingly developed market economy, led to the differentiation of three systems of corporate governance:

1. One-tier system of corporate governance (one-tier system) developed in Anglo-Saxon countries (USA, UK, Canada) - characterized by one body governing society, including both executive and non-executive members. In such an environment, the Supervisory Board is often referred to as the Steering Committee, and it is very important that the position of General Director and the Chairman of the Board of Directors is taken by the same person. This system facilitates the creation of strong management structures and effective decision making. However, non-executive and independent directors play a crucial role in monitoring leadership and reducing executive costs.

2. A two-tier system of corporate governance, characteristic for Germany and Japan - characterized by the existence of a separated Supervisory Board (supervisory board) and a Board of Directors (executive board). Under this system, day-to-day management of the company has been handed over to the executive committee controlled by the Supervisory Board elected by the Assembly. These two bodies have separate powers and their composition can not be combined. The advantage of such a system is a clear control mechanism, but ineffective decision making is undermined.

3. **A mixed system** of corporate governance, widely accepted in transition countries, featuring the characteristics of the two above mentioned management models (Kaster, 1992).

At the beginning of the 21st century, corporate governance was even more important due to the increase in the number of scandals and crises that occurred in those years. Crises in large companies such as Enron, WorldCom, Tyco and others have led to a number of reassessments of the role of independent directors, committees, etc. and it led to a review of the professional ethics of companies (Jovanović & Grujić, 2016). Numerous crises have led to the strengthening of the role of corporate governance and increasing its importance in economic development. The causes of problems in the 21st century, such as privatization, technological development, liberalization and the opening up of financial markets, trade freedom and other structural reforms, have enhanced the role of corporate governance, but at the same time it has complicated its functioning and application, with greater investor rights, growth international financial integration, trade and investment, and more difficult corporate governance outside the state borders (Claessens, 2003). The financial crisis 2007-2008 resulted in the discovery of the weaknesses of corporate governance that did not pass the crisis momentum test and where the previous management routine turned out to be very weak - many companies did not manage to protect themselves from various financial risks, etc. Subsequently, the importance of effective supervision of the board of directors and managerial decision-making and management of the company became apparent (Kirkpatrick, 2009).

Therefore, it is precisely during the crisis years that all the principles of corporate governance have been tested, as well as its ability to adapt to the new circumstances on the market. Hence the need to modify the principles of corporate governance and upgrading as a way of managing the company, both by the way and the process of reaching every decision that pretends to be the decision of the majority in the company and control over given decision-making processes and management of the company.

Today's modern agriculture and agribusiness consistently puts ever more stringent demands for decision-making at all levels, whether it is national agriculture or a family farm (Nedeljković et al., 2017). If the specificities characteristic of the agricultural cooperatives are added to this, then this process of deciding how to manage and manage the cooperative is far more complicated.

Some authors group factors that distinguish business decision-making in agribusiness from other branches of the economy, in the following way (Srđević, 2006):

1. International factors (international and neighborly general political relations, customs, contingents, subsidies).
2. Domestic state factors (organization and competence, development strategy, legislation, financing, loans).
3. Fees and prices (price policy, regulations, contracts, controls, collection, budgeting).

4. Ownership of agricultural and related resources (state, private, mixed).
5. Loans (long-term, short-term, interest rates).
6. Investments (capital, loans, investors).
7. New technologies (transport, storage, systems, equipment, materials, IT resources and infrastructure).
8. Factors related to heritage and experience.
9. Perception of existing and anticipation of possible risks of agricultural production.
10. Willingness to adopt new knowledge and technology.
11. Willingness (motivation) to participate in decision-making and participates in the responsibility of the implementation of decisions.

Therefore, in order to achieve success in the agribusiness, proper and adequate managerial decisions must be made about the development of production, its structure and investments, etc. (Vujatović & Stojanović, 2008).

In what way, on the basis of everything mentioned above, apply the principles of corporate governance in agricultural cooperatives. If corporate governance is defined as a set of rules for the proper management of a company, then the protection of the rights of minority shareholders that are not equal in decision-making etc., then we must apply different corporate governance so differently to cooperatives. Namely, in agricultural cooperatives one of the basic principles of management is the rule “one cooperative - one vote”, and in the assembly of the cooperative all have the same right to decide. The Law on Cooperatives (Article 13) lists the application of the provisions of the Law on Companies that regulate the legal position of the limited liability company, on all issues not regulated by the Law on Cooperatives.

Therefore, in this sense, the Cooperative is considered as a company and, as such, with all its specifics, has its own bodies, the assembly, the administrative and the supervisory board and the director, and all the rules of corporate governance and decision making can be applied to business decision making, operation and management the agricultural cooperative, taking into account the motive of its establishment, characteristics of membership, basic values, support and protection enjoyed by the state.

Thus, the chance of survival on the market in extremely turbulent times, where profit is above all possible values, and the richness of investors above the basic and perhaps even moral values of man are increasing.

In accordance with the positive legal regulations of agricultural cooperatives, what model of corporate governance could be applied in the management of the agricultural cooperatives? Although according to the provisions of the Law, the cooperative is managed by the cooperatives, however, the director who represents the cooperative, organizes and manages business, ensures legality and is responsible for the lawful

operation of the cooperative, prepares a working plan and development program and other (Article 48 of the Law on Cooperatives). Also, it is stipulated that the director of a cooperative does not have to be a member of a cooperative, that is, that he can be an independent member, along with, of course, provisions regarding the prohibition of competition (performing the same or similar jobs in another cooperative of the same or similar activity, as well as membership in another cooperative, etc.). Analyzing the Law, it has been established that the management of the cooperative has implemented a bicameral management system, where the Supervisory Board controls the work of the director of the cooperative. Although the same law provides for the appropriate implementation of the Law on Companies, the part concerning the limited liability company, for the management of the cooperative, as stated, the model of the bicameral management system is used, while for a limited liability company in the Companies Act, the possibility of choosing between the one-tonne (where the work of the director is supervised by the assembly) and the bicameral management system (Maričić, 2016). Therefore, in the Law on Cooperatives the legislator prescribed double control in the management of the cooperative, that is, that the work of the director is controlled by the first board of directors and then by the supervisory board, and that the administrative and supervisory board, on the other hand, elects the assembly of the cooperative, which can not be simultaneously members of both organs. In addition to the work of the director, the supervisory board controls the work of the management board, and the control of the management takes place on several levels. So even though the director of a cooperative can be a person who is not a cooperative, his work is controlled by the first board of directors, and the supervisory board and at the end of the assembly of the cooperative, who ultimately chooses and dismisses the duties of the director of the cooperative. From this structure of the management of the agricultural cooperative, a better business decision can be expected, which is more controlled by the cooperatives and, as such, can fully apply the principles of corporate governance, although it is practically not a big legal and economic system. However, if the condition for the establishment of an agricultural cooperative is at least 5 business-minded individuals, how can the system of multiple control be applied? It would not be practically unhelpful, due to the insufficient number of co-workers who would be members of the management and supervisory boards, and theoretically would be unnecessary, due to the hypothetical lack of pluralism of interest, since then the association is simpler and also management is in the interest of all.

Conclusion

Although global and domestic literature links corporate governance to large-scale economic systems, its rules can easily be adapted to smaller companies, and to specific legal entities, such as agriculture cooperatives. Only here, instead of the corporate governance code, cooperative values are applied and principles established by law, and corporate governance modify and adapt with their specific objectives. For agricultural cooperatives, which have more cooperatives, it is even necessary to apply proper management for the survival of cooperatives, increasing their competitiveness on the

market of agricultural products, and even the survival of the Serbian village that gets “old and extincts”. The state’s obligation is to enable the recovery and sustainable development of the Serbian village, and thus the overall development of rural areas, through the stimulation of agricultural cooperatives, or the association of small agricultural holdings. Also, the fact that the Strategy for the Development of Agricultural Cooperatives has not been officially adopted, and that in the Strategy of Agriculture and Rural Development, only few pages are given to cooperatives, it supports the fact that there has not yet been enough effort to popularize agricultural cooperatives, that the future cooperatives and others who still do not know that this is how they would more easily protect and realize their interests in agricultural production, educated on what are the basic values of cooperatives. The basic path towards reform and encouraging the development of the given area, certainly begins with legislative and institutional frameworks, but education is the one that will bring closer the basic ideas, the meaning and the values of the agricultural cooperatives to all interested persons. Only after that, it is possible to expect the practical revival of co-operatives and associations in general on cooperative bases, which are as such established more than 100 years ago.

Conflict of interests

The authors declare no conflict of interest.

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SUSTAINABLE TOURISM DEVELOPMENT OF MOUNTAIN TOURISM DESTINATIONS IN SERBIA

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ABSTRACT

Tourism represents the fastest growing branch of economy, which is focused on the realization of economic effects. In the previous period of tourism development, no account was taken of natural resources and the environment. Contemporary trends indicate the existence of a growing demand for preserved natural resources and ecologically clean environment. This trend has caused sustainable tourism development, which will establish a positive relationship between the tourism development and the preservation of the environment. This paper presents the fundamentals of sustainable tourism development. Serbia's mountain areas have a preserved potential of natural resources and the environment, which are the basis for the development of sustainable tourism. The aim of paper is to analyze the previous tourism development of mountain tourist destinations in Serbia, such as Kopaonik and Tara. The indicators of sustainable tourism are tested in this paper, and the results will show whether the previous tourism development in these areas was sustainable or unsustainable.

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Introduction

In the middle of the XX century, i.e. from the year 1950, tourism has experienced an explosive and accelerated growth. Development of mass tourism has led to the economic effects of tourism to become a crucial comparative advantage of tourism development

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in one destination. There were recognized numerous economic effects that are created by mass tourist movements, such as increased inflow of foreign funds, increase of employment and income, improvement of pay balance, increase of investments (Bošković, 2008). However, increase of the number of tourists has conditioned a growing and uncontrolled exploitation of natural resources and impairment of the quality of life environment. Natural resources were observed as a means for creating tourism products and meeting tourism needs. Accelerated development of tourism has a negative impact on life environment and natural resources, which is reflected in big amounts of waste, emission of harmful gases and pollution of water, air and land, uncontrolled usage of natural resources, especially non-renewable. On the other hand, the protected areas are becoming a rarer resource in a modern environment, and therefore the interest of tourists in such preserved areas is on the rise (Štetić, Cvijanović, Šimičević, 2014). Many researchers have suggested that the relationship between geography, tourism and protection is dynamic and complex (Sharpley, 2009; Williams, Ponsford, 2009; Nyaupane, Poudel, 2011; Briassoulis, Van der Straaten, 2013; Holden, 2016). Eagles and McCool, 2002 (according to Brankov, 2010) argued that tourism is a fundamental element that determines whether society has awareness and sufficient level of understanding to preserve a certain area.

Tourism should be developed in accordance with the sustainability principles. Sustainability principles require changes in the way of thinking and values, where the changes must include global interdependence, life environment management, social responsibility and economic sustainability (Drumm et al., 2004). Sustainable tourism represents a positive approach that must retain economic advantages of tourism development, but also to reduce negative effects on natural resources and life environment. Sustainable tourism implies such a tourism development that meets the needs of tourists, as carriers of demand, tourist destination as carriers of the offer, with a simultaneous preservation and enlargement of the potentials for using tourist resources in the future, without endangering the possibility of future generations to meet own needs (Hrabovski Tomić, Miličević, 2012).

Impact of tourism on the environment and the need for sustainable development

Two main fields of tourism impact on life environment are pressure on natural resources and damages of the ecosystem. Uncontrolled development of tourism leads to the degradation of life environment, but also degradation of life environment in return represents a serious threat to tourist activities (Neto, 2003). There are numerous negative impacts of tourism on the environment that can be classified in the following manner (Maksin et al., 2009, p.19):

- **economic** – destruction of the traditional form of business (especially agriculture and fishing), a significant share of non-qualified and poorly paid jobs for local workforce, high import dependence and reduction of foreign inflows, etc;
- **socio-cultural** – loss of cultural identity, disappearance of traditional value systems, crime, marginalization and stratification of population, etc;

- **ecological** – increased scope and intensity of using natural resources, creation of big amounts of waste, increased noise and emission of harmful gases, occupation of agricultural land and forests for tourist purposes and contents, etc.

In addition to direct negative impacts of tourism on the environment, there are both indirect and induced impacts of tourism. Indirect impact refers to newly-built accommodation capacities or other capacities of tourist industry in a specific tourist region that provide increase of employment of both local population and population from other regions, which is a positive indirect effect of tourism, but simultaneously increased capacities result in the increase of the number of tourists who perform a significant pressure on the life environment and usage of natural resources. Induced impact of tourism refers to the development of other industrial branches (e.g. agriculture) in the environment in order to meet tourist needs. The increase of the number of tourists results in the increased needs for food, i.e. agricultural products, which further affects the increase of the scope of agricultural production and extension of agricultural surfaces, increase of the usage of mineral fertilizers, increased consumption of water resources and pollution (Weaver, 2006).

In the last couple of decades, when creating tourist offer, we did not pay much attention to the protection of natural resources and life environment, since the advantage was given to the achievement of economic profit. However, the appearance of ecological issues, due to uncontrolled and accelerated tourism development have started to point to the conclusion on reduction of desirability among the tourists. Over the time, we have come to the idea on application of sustainable development concept which should provide the preservation of natural resources and life environment. The application of sustainable tourism concept should contribute to the minimization of negative impacts of tourism to the environment and maximization of positive effects of tourism, which will provide a long-term development of tourism.

Research methodology

Main goal of the research is the observation of previous tourism development on the mountains of Serbia, as well as observation of effects of applying the indicators of sustainable tourism on the example of Kopaonik and Tara mountains (and national parks, also) which should show whether previous development of tourism was sustainable or not. National parks are the most complex category of protected resources. Due to their protected status, these areas should conform to the sustainable forms of tourism development (Brankov, 2010; Brankov, 2015; Brankov et al., 2015). Having in mind that mountains of Serbia own a diverse and mainly unimpaired potential of natural resources, application of the elements of sustainable tourism concept must become crucial when projecting future tourist development of Serbia. Starting from a defined subject and goals of study, there were the following *research hypotheses* set:

H₁: Development of sustainable tourism is a result of the increase of tourist demand for a quality life environment and unimpaired natural resources.

H₂: Application of sustainable tourism concept has a positive effect on tourism development in the long run.

H₃: Development of tourism on Kopaonik is based on unsustainable bases that are not acceptable in the long run.

H₄: Tara owns a potential for the sustainable tourism development in the following period.

In accordance with the set subject and goals of the research, as well as main research hypotheses, in this paper we have applied quantitative and qualitative methodology.

Comparative indicators of sustainable development of EU

Monitoring of the effects of tourism development, i.e. verification of the progress in the aspect of sustainable tourism development cannot be imagined without appropriate indicators (Miller, 2001). Indicators provide monitoring and measurement of changes in development of sustainable tourism over the time with the aim to more easily observe the trends of sustainable tourism development and avoid unpredicted harmful effects. According to the World Tourism Organization, indicators are measures or existence or seriousness of current issues, signals of the upcoming situations or issues, measures of risks and potential needs for acting and means for identification and measurement of the results of actions occurred. They are the set of information that were formally selected to be regularly used in measurement of changes that are significant for tourism development. Good indicators provide some of the following benefits (WTO, 2004):

- Better decision making – reduces risk or costs,
- Identification of urgent issues – provides prevention,
- Identification of impacts – provides corrective actions when it is necessary,
- Measurement of the effect of the plans implemented and managerial activities – provides a progress in sustainable development of tourism,
- Reduces the risk of planning mistakes – identifying constraints and possibilities,
- Greater responsibility – provides authentic information for the public and interest groups in tourism encouraging the responsibility for a wise decision making,
- Continuous monitoring can lead to continuous improvements.

Comparative indicators integrate economic, ecological, social and cultural factors, as well as satisfaction of tourists. Accordingly, the indicators have been classified into five groups which are shown in Table 1, (Jovičić, Ilić, 2010):

- ***Economic indicators*** – show economic effects of tourism business in tourist place and region;
- ***Satisfaction of tourists*** – level of satisfaction of tourists with the quality of tourist capacities and services provided, as well as their opinion on attractiveness of motives, state of life environment and socio-cultural characteristics of receptive region;

- **Social indicators** – reflect social integrity of local community, from the aspect of subjective welfare of domicile population in tourist destination;
- **Cultural indicators** – express the level of preservation of cultural identity of local community, under the effect of the impact of tourists who come from the environments with a different cultural characteristics;
- **Indicators of the state of life environment** – they should provide the image of the state of life environment and impacts that tourism has on particular media (water resources, air, biodiversity, land).

Table 1. Comparative indicators of sustainable tourism

Type of indicators	Indicator	Interpretation
Economic	Seasonal character of the circulation: % visits in full season (3 months)	< 40% green zone 40-50% yellow zone >50% red zone
	Ratio of nights and accommodation capacities	>150% green zone 120-150% yellow zone < 120% red zone
	Coefficient of local tourist increase	Not specified
Satisfaction of tourists	Repeated visits: % repeated visits in the period of 5 years	> 50% green zone 30-50% yellow zone < 30% red zone
Cultural	Relationship of accommodation capacities and number of local population	< 1,1:1 green zone 1,1-1,5:1 yellow zone >1,6:1 red zone
	Tourism intensity: number of nights (000) according to population (00)	< 1,1:1 green zone 1,1-1,5:1 yellow zone >1,6:1 red zone
Social	Share of tourism in local net social product	We should compare with a share of tourism in local employment
	% of tourists who do not come through the tour operators	>70% green zone 50-70% yellow zone <50% red zone
Indicators of the state of life environment	Land: % land in which construction was built but it is not implemented	<10% green zone 10-20% yellow zone >20% red zone
	Usage and occupation of land: % change in construction of region within 5 years	Still not specified
	Transport: % of arrival of tourists who do not use private cars	>20% green zone 10-20% yellow zone <10% red zone

Source: Stojanovic, V. (2011), *Turizam i održivi razvoj*, Novi Sad: Prirodno-matematički fakultet

The application of economic, cultural, social indicators, as well as indicators of the state of life environment and satisfaction of tourists, is based on coding system, by which we determine border values for each indicator. Border value is the value or range of values,

which identifies critical change of a specific indicator. It often labels demarcation line between sustainable and unsustainable type of tourist development (Jovičić, Ilić, 2010, p.270). Based on border values, by indicators we evaluate the state of tourism development as: critical, bearable and sustainable, and thus they are called warning indicators. By the mentioned coding system there are three zones introduced, and each of them reflects current state of tourism development in a particular destination. Those zones are (Stojanović, 2010, p. 225).

- **Red zone** – labels that situation is critical and that it is required to take appropriate measures at once, in order to modify further development of tourism, put it under firmer control or even stopped;
- **Yellow zone** – points out that situation is bearable, but that progressive growth of tourism in the following period can cause serious problems so it is recommendable to undertake certain preventive measures;
- **Green zone** – the existing state of tourism development is evaluated as sustainable, which is the result of a quality management and purposeful measures and activities undertaken in the previous period:

In the paper, there is given the presentation of the movement of the indicators of sustainable tourism for the two selected mountains, Kopaonik and Tara.

Application of indicators of sustainable tourism on the example of Kopaonik

Application of comparative indicators of sustainable tourism of EU on the example of Kopaonik, should show whether and to what extent in sustainable development of tourism achieved. A more detailed interpretation of particular indicators of sustainable tourism development of Kopaonik which were analyzed based on the achieved tourism indicators in the year 2016 are shown in Table 2.

Table 2. Indicators of sustainable tourism for Kopaonik

Type of indicators	Indicator	Interpretation	
Economic	Seasonal character of the circulation: % visits in season (3 months)	51,02%	Red zone (unsustainable)
	Ratio of nights and accommodation capacities	91,74	Red zone (unsustainable)
	Coefficient of local tourist increase	Small	
Satisfaction of tourists	Repeated visits: % repeated visits in the period of 5 years	75%	Green zone (sustainable)
Cultural	Ratio of accommodation capacities and the number of local population	3,38:1	Red zone (unsustainable)
	Tourism intensity: number of nights (000) according to the number of people(00)	30,94:1	Red zone (unsustainable)

Type of indicators	Indicator	Interpretation	
Social	Share of tourism in local net social product	Significant and growing	
	% tourists who do not come through the tour operators	Over	Green zone (sustainable)
Life environment state indicators	Land: % of land where construction is allowed but not realized	-	-
	Usage and occupation of land: % of changes in construction of region within 5 years	Too much constructed	
	transport: % of arrival of tourists who do not use private cars	10%	Red zone (unsustainable)

Source: Author's research

Seasonal character of tourist circulation – According to the data of the Republic Bureau of Statistics of the Republic of Serbia, on Kopaonik in 2016 there were 495.753 nights recorded, i.e. 117.942 tourist visits (RZZS, 2016). Of that number, in the three most visited winter months (January, February and March) there was recorded 252.919 nights or 51,02% of the total number of tourist nights realized in the year 2016. When we observe border values for seasonal concentration of tourist circulation within three most visited months, value of the indicator obtained of 51,02% points to the red zone, i.e. unsustainable situation for natural resources and life environment of this tourist organization.

Ratio of nights and accommodation capacities is 91,74 nights per bed and also points to the red zone, i.e. low level of using accommodation capacities. Kopaonik has ultimately unsustainable value of this indicator, which points to the conclusion that there are enough accommodation capacities, so it is required to invest in development of new forms of tourism which will contribute to greater usage of accommodation capacities in the following period.

Coefficient of local tourist increase – development of tourism on Kopaonik should encourage development of a big number of industrial branches (agriculture, trade, transport, etc.). Unfortunately, tourism on this mountain has not contributed significantly to the development of other industrial branches, whose products and services make integral components of the total tourist offer. According to that, we can say that coefficient of the local tourist increase is small because Kopaonik has not used tourism development for the increase of local economy.

Repeated visits of tourists represent an indicator of tourists' satisfaction with a particular destination. For determination of this indicator there are no adequate data available, since the statistics of repeated visits is not led. Of the total number of reviewed people, 80% of respondents have stated that they stayed on Kopaonik once or several times and 75% said that they would visit this destination once more. According to the EU criterion, this percentage belongs to the green zone, which means that Kopaonik is attractive, that it is well-positioned in tourism market, that tourist products that it offers are acceptable to tourists and that it offers high-quality satisfaction.

Ratio of accommodation capacities and number of local population on Kopaonik is unsustainable. Namely, number of accommodation capacities in 2016 was 5.404, and number of people living on the mountain and offering tourist services is 1.600 (RZZS, 2016). By putting these two factors together we obtain the proportion of 3,38:1. According to EU criterion, value of this indicator belongs to the red zone, which means that tourism on Kopaonik is unsustainable because excessive number of accommodation capacities has a negative impact on cultural identity of local community, we get the impression that tourist place is overloaded, which has a negative effect on the quality of tourist experience.

Intensity of tourism shows the ratio of the number of nights and population. Number of nights on Kopaonik in 2016 was 495.753 (RZZS, 2016), while the number of local population offering services to tourists was 1.600. Proportion is 30,94:1, which means that cultural identity of local community is under the excessive impact of tourism because the proportion mentioned belongs to the red zone. Therefore, on Kopaonik, circulation of tourists reaches great proportions, which jeopardizes cultural identity of local community and reduces the quality of tourist experience.

Share of tourism in local net product shows the contribution of tourism to the creation of local domestic product. Precise data for determination of this indicator do not exist, but we can provide a qualitative evaluation. Since tourism is a dominant industrial branch on Kopaonik, tourism development has a positive effect on development of local community, so we can conclude that share of tourism in local domestic product is significant and growing, which is positive from the aspect of sustainable tourism development.

Percentage of tourists who do not come through tour operators cannot be determined based on quantitative data because there are no precise data that point to the manner of tourists arrival. We can say that more than 70% of tourists do not come through tour operators, which is a green zone according to the EU criterion, i.e. value of this indicator is considered an indicator of sustainable tourism.

Usage and occupation of land, as an indicator of the life environment state, shows the changes in the purpose of using the land, through the increase of construction of tourist capacities. In case of this indicator, there are not defined border values, but the extension of tourist capacities that occupation of new land requires has a negative effect on life environment. By analyzing the data of the Republic Bureau of Statistics, number of accommodation capacities in 2010 was 4.325 beds (RZZS, 2011), while that number has grown up to 5.404 in 2016. (RZZS, 2016), which means that the number of beds on Kopaonik was increased by 20%. Kopaonik has through tourism development experiences an exceptional level of urbanization, since the number of accommodation capacities was increased more than it should. Scope of building the capacities for accommodation of tourists is not satisfactory, particularly from the aspect of location of the construction which is labeled as national park. Construction of infrastructure has greatly changed primary appearance of this protected area and degraded its resource

potential. By analyzing the level of tourist capacities construction, we can say that Kopaonik is too much constructed.

Percentage of tourists who do not come by private cars is related to the indicator which marks the percentage of tourists who do not come through tour operators. During main tourist season, on Kopaonik there is an issue of great traffic jams and parking, which points out that a great number of tourists come by their private cars. Having in mind that there are no precise data for establishment of this indicator, we can say that about 10% of tourists do not come by their own transport means, which according to EU criterion is included in the red zone, i.e. zone of unsustainability of tourism from the aspect of life environment.

Based on the analyzed indicators of sustainable tourism on Kopaonik we can conclude that previous concept of tourism development was not in accordance with sustainable development principles and that it is not acceptable in the long-run. Out of 10 indicators analyzed, even five of them belong to the red zone, while only two are in the green zone, which clearly points out that tourism development on Kopaonik is not developed in accordance with sustainable development principles. In order to improve total effects of tourism it is required to change or complement the existing forms of tourism with some new forms that will be in accordance with sustainable tourism development.

Application of sustainable tourism indicator on the example of Tara

Application of comparative indicators of EU sustainable tourism on the example of Tara is given by the presentation in Table 3.

Table 3. Indicators of sustainable tourism on the example of Tara

Type of indicators	Indicator	Interpretation	
Economic	Seasonal character of circulation: % of visits in season (3 months)	38,62%	Green zone (sustainable)
	Ratio of nights and accommodation capacities	347,03	Green zone (sustainable)
	Coefficient of local tourist increase	medium	
Satisfaction of tourists	Repeated visits: % repeated visits in the period of 5 years	50%	Green zone (sustainable)
Cultural	Ratio of accommodation capacities and number of local population	0,25:1	Green zone (sustainable)
	Tourism intensity: number of nights (000) according to the number of people (00)	8,68:1	Red zone (unsustainable)
Social	Share of tourism in local net domestic product	Significant and growing	
	% of tourists who do not come through tour operators	60%	Yellow zone (partially sustainable)

Type of indicators	Indicator	Interpretation	
Life environment state indicators	Land: % of land where construction is allowed but not realized	-	-
	Usage and occupation of land: % of changes in construction of the region within 5 years	Sufficiently built	
	Transport: % of arrivals of tourists who do not use private cars	20%	Yellow zone (partially sustainable)

Source: Author's research

Detailed interpretation of particular indicators of sustainable tourist development of Tara was analyzed based on the achieved tourist indicators in 2016.

Seasonal character of tourist circulation – On Tara in 2016 there was realized 243.613 of nights, i.e. 63.651 tourist visits (RZZS, 2016). Of the total number of tourists, during the three most visited months (April, May and June) there was recorded 24.580 tourists or 38,62% of the total number of tourists in 2016. When we observe border values for seasonal concentration of tourist circulation within the three most visited months, value of the indicator obtained of 38,62% points to the green zone, i.e. sustainable situation for natural resources and life environment of this destination.

Tara realizes sustainable values of the indicator analyzed, since it has a relatively harmonized visit of tourists by months. From the standpoint of sustainable development of tourism, it goes in favour of tourist workers and the destination itself. The three most visited months are April, May and June, since recreational classes for primary schools' students is organized here. Even concentration of tourists does not reduce the quality of tourist experience and evenly performs pressure on natural resources and life environment. From the aspect of sustainable development of tourism, even concentration of tourists is desirable and acceptable, because it shows that developed forms of tourism do not depend on climate factors.

Ratio of nights and accommodation capacities was 347,03 nights per bed, which is a result that points to the green zone, i.e. sustainable value of this indicator. Therefore, on Tara there is a high level of accommodation capacities exploitation.

Coefficient of local tourist increase – tourism development on Tara should encourage the development of a great number of industrial branches. Having in mind that there are no precise data that would provide the determination of this indicator, there is only a qualitative evaluation given. Observing the development of other industrial branches we can conclude that tourism has had a significant contribution to their development because products and services of local area are included in tourist offer, but there still isn't achieved a satisfying level so we can say that coefficient of local tourist increase is medium.

Repeated visits of tourists show that of the total number of interviewed people, 50% of respondents have said that they have stayed on Tara mountain once or several times,

and 45% that they would visit this destination once more. According to the EU criterion, this percentage is on the border between green and yellow zone, which means that Tara is well-positioned on tourist market, that tourist products that it offers are acceptable to tourists and that it offers the satisfaction of high quality.

Ratio of accommodation capacities and the number of local population on Tara is sustainable and it is 0,25:1. Value of this indicator belongs to the green zone, which means that tourism on Tara is sustainable because a number of accommodation capacities is significantly lower in relation to the number of local population. Sustainable value of this indicator points to insignificant impact of tourism to the cultural identity of local community.

Tourism intensity with the value of 8,68:1 points that cultural identity of local community was under the impact of tourists because the mentioned proportion belongs to the red zone. Therefore, Tara is a destination where circulation of tourists reached the proportions that jeopardize cultural identity of local community and reduce the quality of tourist experience.

Share of tourism in local net product points to the contribution of tourism to the creation of local domestic product. Precise data for determination of this indicator do not exist, but we can give a qualitative evaluation. Since tourism is dominant industrial branch on Tara, development of tourism has a positive effect on development of local community so we can conclude that share of tourism in local net product is significant and growing, which is positive from the aspect of sustainable development of tourism.

Percentage of tourists who do not come through tour operators cannot be determined based on quantitative data, because there are no precise data that point to the manner of tourists arrival. We can say that about 60% of tourists do not come through tour operators, which according to the EU criterion is a yellow zone, i.e. value of this indicator is considered the indicator of sustainable tourism.

Usage and occupation of land is determined according to the data of the Republic Bureau of Statistics of the Republic of Serbia (Statistical Yearbook, 2016), by comparing the number of accommodation capacities in 2011 (1117 beds) and in 2016. (702 beds). Scope of construction of capacities for accommodation of tourists is satisfactory, having in mind that Tara is pronounced as national park. Construction of tourist infrastructure has not changed primary appearance of this protected area and degraded its resource potential, which is good from the aspect of sustainable development of tourism.

Percentage of tourists who do not come by private cars points out that the situation on Tara can be labeled as partially sustainable from the aspect of environmental protection and preservation of natural resources, since there are tourists who do not come by their own cars. In favour of that, there is a relatively good network of bus lines in the mountain region of Tara. Having in mind that there are no precise data for establishment of this indicator, we can say that about 20% of tourists do not come by their own cars, which according to the criterion of EU is in the yellow zone, i.e. zone of partial sustainability of tourism from the aspect of life environment.

Based on the analysis implemented we can conclude that out of 10 analyzed indicators of sustainable tourism, four indicators belong to the green zone, two to yellow, while only one indicator belongs to the red zone, so we can conclude that tourism development on Tara is developed in accordance with sustainable development. This points to the fact that previous development of tourism was in accordance with sustainable development principles.

Conclusion

Mountain destinations of Serbia and resources that are found in them are the basis of future economic development of the country. Serbia disposes with relatively preserved natural resources, so development of tourism should be in accordance with sustainable development. However, development of mountain tourism in previous period was oriented on mass tourism development. It is best observed on the examples of Kopaonik and Tara. In addition, excessive visits of tourists resulted in mass construction of tourist capacities, as well as big concentration of traffic in these destinations, which has impaired the quality of natural resources and life environment. Previous development of mountain tourism of Serbia was mainly oriented on winter tourism, which is economically cost-effective, but contributes to degradation of sensitive mountain nature.

Kopaonik and Tara represent destinations with long-term tradition of tourism development. After the analysis of previous tourism development on Kopaonik, we have come to the conclusion that seasonal character is expressed during winter months, which is not acceptable solution from the aspect of sustainable development of tourism. Kopaonik has a low level of accommodation capacities exploitation, and thus the investments in development of new forms of tourism that will contribute to greater exploitation is required. Having in mind that Kopaonik has a status of national park, a great level of constructed tourism infrastructure has largely changed the primary appearance of this protected area and degraded its resource potential, which is not good. This destination also has a problem with big concentration of the traffic, since most tourists come by private cars, which is also unsustainable. On the other hand, seasonal character of tourist circulation on Tara is sustainable according to the criteria prescribed. Relatively even allocated tourist visits during the whole year are an acceptable solution from the aspect of sustainable development of tourism because pressure to the environment is even and the quality of tourist experience is not reduced. In addition, Tara is specific for sufficient construction of tourist capacities and there is a high level of exploitation of them, which is also positive from the aspect of sustainable development of tourism. Most tourists use own cars when they visit this destination, but there is also a significant share of organized arrivals, which is partially sustainable according to the criteria defined.

From all above-mentioned, we can conclude that Kopaonik, as economically most developed tourist destination, due to excessive and uncontrolled construction of tourist infrastructure, impaired natural appearance of space, impaired life environment and natural resources has reduced possibilities for sustainable development of tourism in the following period. On the other hand, Tara, as economically less developed destination,

is characterized by intact and unimpaired nature and preserved natural resources, so it possesses the potential for development of sustainable tourism in the following period.

In order to achieve sustainable development of tourism it is required to limit, reduce or balance the concentration of tourists, which can be achieved by diversification of tourist products and development of annual tourism. In addition, we should constrain the usage of private cars and reorient tourists for the usage of public transport or ecologically sustainable forms of transport. Mountain areas of Serbia dispose with rich natural resources, which can be used for development of sustainable tourism during the whole year and existing tourist capacities and image built by development of winter mass tourism can serve as a basis for development of sustainable forms of tourism in the following period. What characterizes mountain areas of Serbia is lagging behind in the aspect of sustainable development of tourism in relation to the majority of European countries, since there is no clearly defined strategy of development and protection of mountain areas, not to mention an efficient system of sustainable development management. (Krunić, Milijić, Đurđević, 2010), because sustainable development of tourism is a goal that cannot be entirely achieved, but which should be strived for in the long run (Popesku, 2016). In order to provide sustainable development of tourism, the support and incentives of the country are required as well as providing advantage for the ecologically acceptable tourist offer. The greatest potential for development of sustainable tourism have the undeveloped mountain areas, with the preserved natural resources and life environment.

Bearing in mind the ecological quality, and above all the preservation of the natural resources in Serbia, it is possible to provide better: a market position, strong competitiveness, long-term development sustainability and ultimately higher profitability. On the other hand, starting from the needs of tourists (having in mind the marketing concept as the basic business function of all economic entities), there is a need to harmonize the desire to meet the tourist needs and preserve the environment (Vuković, Cević, Cvijanović, 2007).

Conflict of interests

The authors declare no conflict of interest.

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CARBON DIOXIDE EMISSIONS IN RETAIL FOOD

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ABSTRACT

The analysis of the effects of applying the concept of sustainable development in retail has been attracting interest recently. In that context we have considered greenhouse gases emission in retail. This is achieved by using modern ecological technology in business – through the whole food value chain. The goal is to achieve the planned reductions of carbon dioxide in retail food, which positively reflects the overall performance of food retailers. This empirical research is mainly based on the analysis of the original sustainable reports officially disclosed by selected food retailers. These reports are now an integral part of the integrated reporting on performance of global food retailers. Having been universally important, harmonized regulations on sustainable retail food reporting are being increasingly applied as a data source for more efficient environmental management. In the future, this will enable the comparative analysis of the carbon dioxide emission of global and other food retailers.

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Introduction

Significant attention has been recently paid to the analysis of environmental performance in all sectors, including wholesale and retail trade. Within this, greenhouse gases emission (GHG) in retail food is briefly considered. The overall goal of global food retailers is to reduce carbon dioxide emissions through the entire food value chain. The costs of carbon dioxide emission reduction are significant and affect the performance of food retailers.

The subject of research in this paper is the significance and trend of carbon dioxide emissions in retail food. Based on a comparative analysis of the original officially disclosed sustainable reports of global food retailers, the aim of the research is to comprehensively examine the problem of carbon dioxide emissions in retail through the entire food value chain and to take appropriate measures to achieve the target reduction. The effects of this are the improvement of the overall, especially environmentally-friendly performance of food retailers. The scientific and professional contribution of this work can be reflected in that, because there is scarce literature fully devoted to the issue of carbon dioxide emissions in retail food.

Numerous factors undoubtedly influence carbon dioxide emissions in retail, and these are as follows: type of store, product category, nature of the item itself, sales, location and distance (type of settlement: urban, suburban and rural), carbon policy (Wang et al., 2017), as well as energy sources, type of ventilation and heating of sales and other premises, cooling devices, mode of transport (logistics), waste treatment, and others. Taxation is also a factor in carbon dioxide emissions in all sectors, including retail food (Qin, 2015). Regarding retail formats (types of stores, classical or modern - Internet shops) on-line sales have insignificant carbon dioxide emissions and, viewed through a value chain, it occurs only in warehousing, while in distribution and in the store, equals zero, contrary to the other types of stores (Seebauer et al., 2016). Carbon dioxide emissions vary by product category (food and non-food products) and within one product category, by individual items, depending on their nature (Linda, 2014; Sullian 2016; Eriksson, 2017). All in all, the main sources of carbon dioxide emissions in retail are as follows: electricity, transport, ventilation and heating, refrigeration and waste. Effective control of the factors that influence the emission of carbon dioxide can significantly affect the improvement of economic, social and, in particular, environmental performance in retail. For these reasons, it is necessary to know the size and intensity of carbon dioxide emissions in modern retail food, which is the focus of this work.

Materials and methods

There is a voluminous literature devoted to analyzing the way company's performance is affected by general problems and effects of carbon dioxide emission reduction through the whole (food) chain (Jones, 2005; Martinuzzi, 2011; Kahn, 2014; Congcong, 2016; Li, 2016; Seebauer et al., 2016; Bazan, 2017, Clune, 2017), as well as consumer

preferences (Ji, 2017). In other words, it is generally known that carbon dioxide reduction increases the economic performance of companies (Cusshiella, 2017), the profitability of producers and retailers, as well as consumer preferences (Eagle, 2017). In view of the significance of the problem of carbon dioxide emissions, generally speaking, the number of papers dedicated to the specificities and impacts of carbon dioxide emission reduction on the performance of retail companies is modest (Patten, 2014; Makarov, 2015; Riboldazzi, 2016; Sullian, 2016). In Serbian literature this issue is only partially considered in some papers (Lukic, 2011a, b, 2012, 2014, 2016a, b, c, 2017). For that reason, this paper attempts to make thorough analysis of specific issues of carbon dioxide emissions in the retail sector, i.e. retail food, firstly on the example of global retailers from different countries, primarily developed market economies, which, due to the general importance of the matter, publish reports on sustainable development along with regular annual financial reports. This practice of global retailers provides them with more reliable information base for efficient management of carbon dioxide emissions through the whole value chain. This is particularly true for retailers in Serbia whose practice of making the reports on environment and sustainable development publicly available has just begun.

The general research hypothesis in this paper is that the reduction of carbon dioxide emissions positively reflects on overall (integrated, especially environmental) performance of retailers (food). The methodology is primarily based on the comparative analysis of the carbon dioxide emission of global selected food retailers from various comparable developed market economies. The problem of comprehensiveness of the research on carbon dioxide emissions in retail food is that, at the time being, there is no unified system of sustainable (environmental) reporting for all retailers. In addition, many retailers still do not publish their reports, thus providing an incomplete “comparability” of data on carbon dioxide emissions by individual food retailers. Nevertheless, understanding of the importance and trend of carbon dioxide emissions from global retailers (food) is very important in order to manage overall, integrated and, in particular, environmental performance in (concrete) retail (food). Globally, other food retailers will increasingly publish reports on sustainable development (with data on carbon dioxide emissions). In this way, they will increase its information base for more efficient management of total business, including environmental protection. This may have a positive impact on the gain of the target profit.

The main data sources for the research of the treated problem in this paper are literature, articles, publications, studies, OECD, Eurostat and, in particular, officially disclosed annual financial and sustainable reports of (global) retailers (food). They were processed in such a way that is easy to comprehend the significance and trend of carbon dioxide emission in retail food.

Results and discussion

The carbon dioxide emission through the entire food value chain is shown in Table 1.

Table 1. Emissions of carbon dioxide through the life cycle of food after farm

Lifecycle stage post-farm gate	Number of GWP (global warming potential) values	Median (kgCO ₂ -eq/kg)	Mean (kgCO ₂ -eq/kg)	Stdev	Min (kgCO ₂ -eq/kg)	Max (kgCO ₂ -eq/kg)
Processing meat	5	0,59	0,66	0,14	0,54	0,87
Processing vegetables	15	0,06	0,07	0,04	0,01	0,013
Packaging	8	0,05	0,06	0,06	0,01	0,21
Transport to RDC (Regional Distribution Centre)	21	0,09	0,13	0,19	0,02	0,95
Retail	20	0,04	0,10	0,25	0,01	1.14

Note: The table is compiled on the basis of various relevant studies.

Source: Clune et al. (2017)

The data in the given table show that, on average, emission of carbon dioxide is higher in the processing of meat than processing of vegetables. It is also higher in transport than in retail, and is the lowest in the packaging phase. This is in line with the nature of the activities concerned.

Different is the carbon dioxide emission of individual retailers (food). This is illustrated by the research results in this paper.

At Wal-Mart (United States of America, Dominant operational format: Hypermarket / Supercenter / Superstore), a great significance is given to reducing carbon dioxide emissions (*Table 2.*). This is achieved by the following: investing in renewable energy sources, reducing energy demand, improving energy efficiency, improving refrigeration in stores and maximizing the efficiency of the vehicle fleet.

Table 2. Carbon dioxide emission (Scope 1 and 2) and retail area at Wal-Mart, 2005-2014

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Carbon dioxide emission (million ton CO _{2e})	18,9	19,3	20,1	20,8	20,3	20,6	20,8	21,2	21,0	21,9
Retail area (million square meters)	740	805	867	921	952	985	1,037	1,072	1,102	1,134

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Carbon dioxide intensity (million tons CO _{2e} /million m ²)*	0,025	0,024	0,023	0,022	0,021	0,021	0,020	0,020	0,019	0,019

Note: Calculations performed by the author

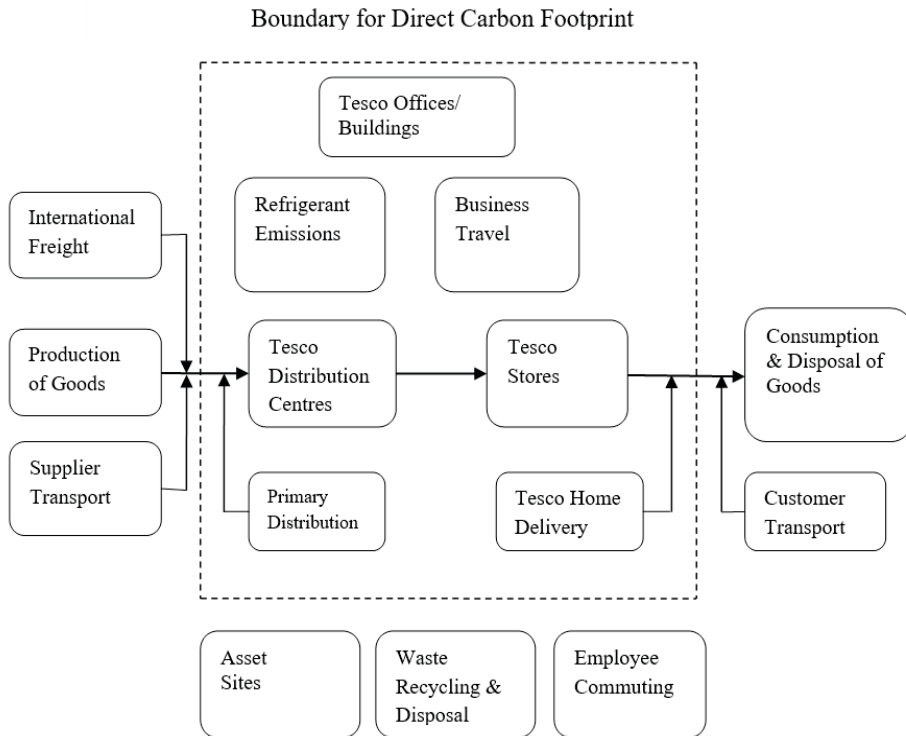
Source: Wal-Mart Stores, Inc. 2016 Global Responsibility Report, available at: <https://cdn.corporate.walmart.com/9c/73/3f9abcef444397f2c771e081e095/2016-global-responsibility-report.pdf#page=58&zoom=auto,-130,628>

In generating greenhouse gas emissions, Wal-Mart participates with the following: electricity supply 69%, refrigeration 18%, fuel transport 5.9%, fuel on the site 7% and mobile refrigerators with 0.1% (Wal-Mart Stores, Inc. 2016 Global Responsibility Report, available at: <https://cdn.corporate.walmart.com/9c/73/3f9abcef444397f2c771e081e095/2016-global-responsibility-report.pdf#page=58&zoom=auto,-130,628>). Therefore, the main source of greenhouse gas emissions in Wal-Mart is electricity supply. With the increased application of the ecological operation principles, Wal-Mart reduced carbon dioxide emissions from year to year, which reflects favourably on its overall performance, especially environmental.

In Kroger (United States, Dominant operational format: Hypermarket / Supercenter / Superstore) carbon dioxide emissions amounted to 32.9 (tonnes of CO_{2e} / 1,000 sq ft) in 2015, and 36.3 in 2006. This means that there was a 9.3% reduction achieved (2016 Sustainability Report / Kroger, available at: <http://sustainability.kroger.com/environment-energy-carbon.html>). The effects of this decrease are the improvement of environmental and overall performance in the company Kroger.

At Tesco (United Kingdom, Dominant operational format: Hypermarket / Supercenter / Superstore), as with Wal-Mart, considerable attention is paid to the research and control of carbon dioxide emissions. This positively reflects on its overall performance, including the surrounding ones. Illustration of the specificity of carbon dioxide emissions measurement at Tesco is shown in *Figure 1*.

Figure 1. Tesco’s emission limit



Source: Carbon Footprint 101: A Guide for Food Retailers, available at: <https://www.fmi.org/docs/sustainability/carbon-footprint-101-a-guide-for-foodretailers.pdf?sfvrsn=4#page=11&zoom=auto,-121.85>

Table 3. and Figure 2. show the greenhouse gas emissions in Tesco.

Table 3. Emission of greenhouse gases in Tesco

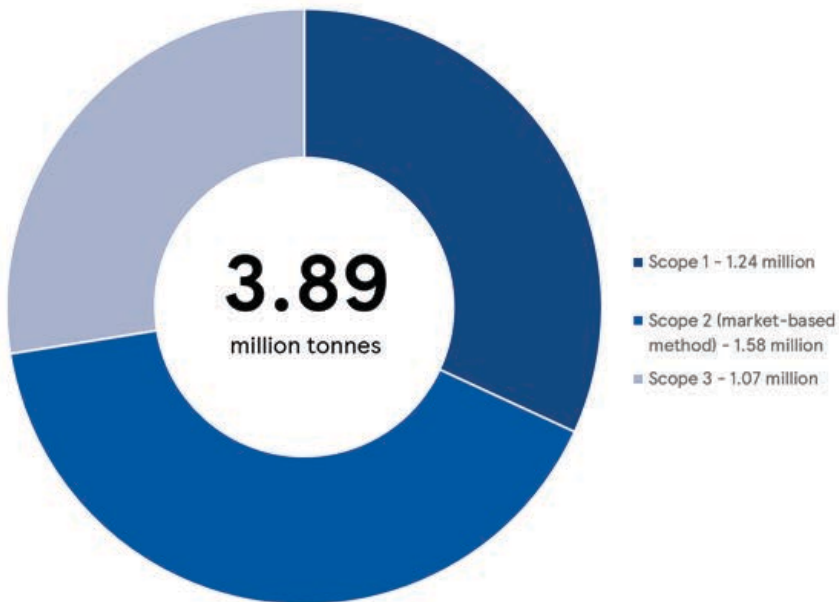
	Total ton CO _{2e}		
	2016/17	2015/16	Base year 2006/07
Scope 1	1,236,980	1,301,746	1,345,507
Scope 2			
Market-based method	1,582,275	2,004,992	Not available
Location-based method	2,357,245	2,528,323	2,259,984
Scope 1 and 2 carbon dioxide intensity (kgCO _{2e} /sq. ft of stores and distributive centres)	22,95	26,33	51,14
Scope 3	1,073,721	1,097,491	1,064,460

	Total ton CO _{2e}		
	2016/17	2015/16	Base year 2006/07
Total gross emission	3,892,977	4,404,230	4,669,951
CO _{2e} from renewable energy exported to the grid	1,154	1,513	-
Total net emissions	3,891,822	4,402,717	4,669,951
Overall net carbon intensity (total net emissions kgCO _{2e} /sq ft of stores and distributive centres)	31,69	35,06	66,23

Source: Tesco PLC Annual Report and Financial Statements 2017, available at: https://www.tescopl.com/media/392373/68336_tesco_ar_digital_interactive_250417.pdf

The data in the given table show that the intensity of carbon dioxide emissions in Tesco is decreasing from year to year.

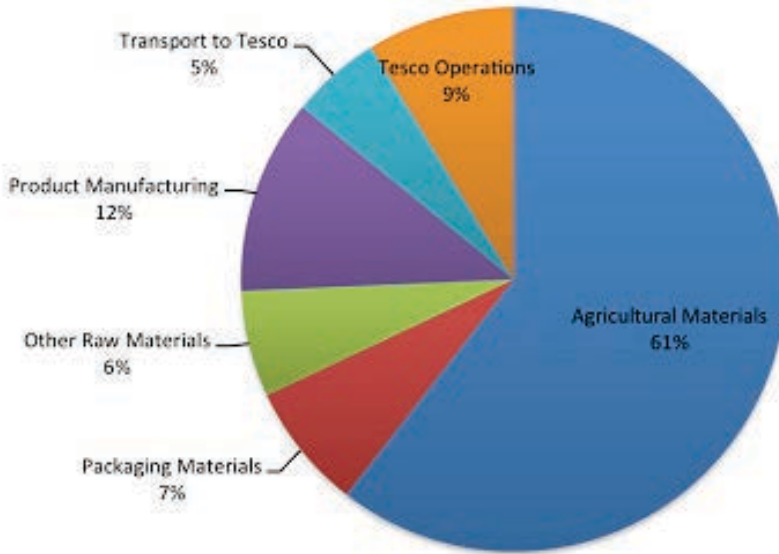
Figure 2. Total carbon dioxide (million tonnes of CO_{2e}) in Tesco 2016/2017



Source: Tesco - Our carbon footprint, available at: <https://www.tescopl.com/tesco-and-society/sourcing-great-products/reducing-our-impact-on-the-environment/our-carbon-footprint/>

Figure 3. shows sources of carbon dioxide emission throughout the value chain, with an emphasis on Tesco's participation in carbon footprint.

Figure 3. Emissions of carbon dioxide by source in Tesco



Source: Tesco - Our Carbon Footprint, available at: <https://www.tescopl.com/tesco-and-society/sourcing-great-products/reducing-our-impact-on-the-environment/our-carbon-footprint/>

Therefore, Tesco participated in total emission of carbon dioxide through entire value chain with 9%.

Table 4. shows ecological performances at Tesco.

Table 4. Global ecological performances at Tesco

	2016/17	2015/16	2014/15	2013/14
Carbon dioxide (million ton CO _{2e})	3,9	5,1	5,26	-
Emission of CO ₂ reduction (stores and distributional centres) compared to 2006/07	40,5%	39,5%	38,3%	-
Emission of CO ₂ reduction (distribution) compared to 2011/12	19,7%	17,4%	14,47%	7,8%
Direct water consumption (million m ³)	23,5	25,5	32,6	32,9
Waste percentage (food and non-food) which is recycled, used again or turn into energy	93%	88%	84%	86%

Source: Reducing our impact on the environment, available at: <https://www.tescopl.com/tesco-and-society/sourcing-great-products/reducing-our-impact-on-the-environment/>

Tesco has tendency to improve ecological performances (carbon dioxide emission reduction, direct water consumption reduction and waste treatment improvement). This reflects favourably on its market, economic and financial performances.

Due to the increasing importance, special attention is paid to carbon dioxide emissions in Marks & Spencer (M & S) (United Kingdom, Dominant Operating Format: Department Store), as shown in *Table 5*.

Table 5. Emission of carbon dioxide in Marks & Spencer

	Plan A baseline 2006/7 (000 tCO_{2e})	Legal baseline 2013/14 (000 tCO_{2e})	Last year 2014/15 (000 tCO_{2e})	2015/16 000 tCO_{2e}	Achievement in relation to 2006/7
Total gross/location-based emission CO _{2e}	732	567	592	566	-23%
Total carbon intensity measure (per 1000 sq. ft of sales floor (ton CO _{2e} /1,000 sq. ft))	46	30	30	29	-47%

Source: M & S Plan Report 2016, available at: http://annualreport.marksandspencer.com/M&S_PlanA_Report_2016.pdf.

At Marks & Spencer, a decrease in carbon dioxide emissions was recorded in 2014/15 in relation to 2006/7. Reduction was achieved by improving energy efficiency using the so-called “green energy” through the whole value chain.

In 2015, Carrefour (France, Dominant operational format: Hypermarket/Supercenter/Superstore) emitted 3.61 million tonnes of CO_{2e}. In 2015, carbon dioxide emissions were reduced by 29.7% compared to 2010. The aim is to achieve a reduction in carbon dioxide emissions by 40% until 2025 and 70% until 2050 (Unique and Multiple/2015 Annual Activity and Responsible Commitment Report, available at: http://www.carrefour.com/sites/default/files/carrefour_2015_annual_activity_and_responsible_commitment_report.pdf). This will have a positive impact on Carrefour’s environmental and overall performance.

Aldi (Germany, Dominant operational format: Discount Store) also publishes reports on sustainable development, in which special attention is paid to the emission of carbon dioxide. *Table 6*. shows the greenhouse gas emissions at Aldi.

Table 6. Greenhouse gases emission in Aldi (tons CO_{2e})

	2014	2015
Scope 1	284,831	312,940
Scope 2	369,961	567,424
Total	654,792	680,364

Source: Aldi-Sustainability Report 2015, available at: https://www.cr-aldinord.com/2015/wp-content/uploads/sites/2/2016/04/ALDI_North_Group_NHB_Sustainability_Report_2015.pdf.

At Aldi, greenhouse gases emissions by sectors (in percent) in 2015 were as follows: electricity 53.1%, cooling equipment 20.0%, heating energy 14.3% and logistics 12.6% (Aldi-Sustainability Report 2015, available at: https://www.cr-aldinord.com/2015/wpcontent/uploads/sites/2/2016/04/ALDI_North_Group_NHB_Sustainability_Report_2015.pdf.)

In order to reduce greenhouse gas emissions, special attention is paid to the use of energy from renewable sources (LED lamps).

At Ahold (Germany, Dominant operational format: Supermarket), considerable attention is paid to the reduction of carbon dioxide emissions. This is shown in *Table 7*.

Table 7. Carbon dioxide emission at Ahold

	2008	2009	2010	2011	2012	2013	2014	2015
Carbon dioxide emissions (thousand tons)				2,176	2,106	2,107	2,090	2,019
Carbon dioxide emissions (kg CO ₂ /m ² sales area)	567	574	543	507	480	473	465	420
Sources (%)								
Electricity								49%
Refrigerant appliances								29%
Fuel								12%
Gas								10%

Source: Ahold - Responsible Retailing Report 2015, available at: <https://www.aholddelhaize.com/media/1934/ahold-responsible-retailing-report-2015.pdf>

Carbon dioxide emissions at Ahold has been decreasing. Since 2016, Ahold has been operating under the name of Ahold Delhaize., *Table 8*. shows data on carbon dioxide emissions for Ahold Delhaize (Belgium, Dominant operational format: Supermarket) in 2016.

Table 8. Carbon dioxide emission at Ahold Delhaize

	2016 Actuals	2020 Target
% reduction in CO ₂ equivalent emissions per m ² of sales area (from 2008 baseline)	-22%	-30%
Total CO ₂ equivalent emissions per m ² of sales area – location-based approach	496	n/a
Total CO ₂ equivalent emissions (thousand tonnes) – location-based approach	4,505	n/a
Total Scope 1 CO ₂ equivalent emissions (thousand tonnes) – location-based approach	1,940	n/a
Total Scope 2 CO ₂ equivalent emissions (thousand tonnes) – location-based approach	2,420	n/a
Total Scope 3 CO ₂ equivalent emissions (thousand tonnes) – location-based approach	144	n/a
Offset CO ₂ equivalent emissions (thousand tonnes)	241	n/a
Avoided grid electricity CO ₂ emissions (thousand tonnes)	31	n/a

Source: Ahold Delhaize Supplementary report on Sustainable Retailing performance 2016, available at: <https://www.aholddelhaize.com/media/3984/supplementary-report-on-sustainable-retailing-performance-2016.pdf>.

Significant reduction in carbon dioxide emissions by 2020 (30%) is expected at Ahold Delhaize. This will be achieved by using so-called “green energy” in business operations. Sources of carbon dioxide emissions were the following: electricity 60%, cooling devices 31% and transport 9% (Ahold Delhaize Supplementary Report on Sustainable Retailing performance 2016, available at: <https://www.aholddelhaize.com/media/3984/supplementary-report-on-sustainable-retailing-performance-2016.pdf>). Delhaize Serbia is also part of Ahold Delhaize which employs the same sustainable development strategy and environment reporting.

In the Fast Retailing (Japan, Dominant Operating Format: Apparel/Footwear Specialty), exceptional attention is paid to the issue of carbon dioxide emission reduction. *Figure 4.* shows carbon dioxide emissions through the entire value chain in Fast Retailing.

Figure 4. Sustainable reporting - Carbon dioxide emission through value chain in Fast Retailing

	Planning	Production	Logistics	Sales	Use/Disposal
In Energy and Raw Materials Usage	Energy, Fuel, etc.	Sewing Factories and Fabric Manufacturers Energy consumed (calories) 17,116,915 GJ Electricity 508,492,602 kWh LPG 1,252,172 kg LNG 7,409,376 kg Natural gas 29,599,589 m ³ Heavy oil 139,769,380 t Light oil 1,440,937 t Gasoline 462,668 t Coal 201,470,102 kg Steam 671,962 t Water usage 24,785,654 t	Logistics Energy consumed (calories) 307,356 GJ	Stores Electricity consumed 217,278,065 kWh City gas consumed 1,455,441 m ³ LPG consumed 1,286,365 m ³	
		Headquarters Electricity consumed 4,779,562 kWh Gas consumed 4,822.2 m ³ (Tap) Water usage 13,876 t			
		Headquarters Copy paper consumed 12,098,500 sheets		Stores Packaging 5,573 t	
Materials					
Out CO ₂ Emissions and Waste	CO₂ Emissions	Headquarters CO ₂ emissions (electricity and gas) 2,660 t-CO ₂			
		Sewing factories and fabric manufacturers CO ₂ emissions 1,705,655 t-CO ₂	Logistics CO ₂ emissions 20,991 t-CO ₂	Stores CO ₂ emissions (electricity) 119,502 t-CO ₂ CO ₂ emissions (gas) 11,735 t-CO ₂	
		Headquarters Combustible waste (paper waste, etc.) 218.8 t Noncombustible waste (plastic waste, etc.) 3.6 t			
Waste and Recycling			Stores General waste 51,440 t	Customers Items collected through All-Product Recycling Initiative 1,457 t	

Notes: The data without annotation is from fiscal 2015. Manufacturing data represent factories that produce UNIQLO products. Logistics figures are for the period from April 2014 to March 2015. Logistics and store data represent UNIQLO stores in Japan. Data from headquarters are figures in Japan (Tokyo head office and Yamaguchi headquarters). Packaging refers to the paper and plastic shopping bags that UNIQLO and GU use in Japan. Items collected through All-Product Recycling Initiative refer to the items received at clothing sorting centers as of August 31, 2015.

Source: Fast Retailing - Sustainability Report, available at: http://www.fastretailing.com/eng/sustainability/environment/co2_popup.html

In 2016, at Fast Retailing, carbon dioxide emissions amounted to 2,917,069 (tCO_{2e}). In logistics it was 17,707 (tCO_{2e}). Table 9. presents carbon dioxide emission (tCO_{2e}) in stores and management offices by sources (generators) at Fast Retailing for 2016.

Table 9. Carbon dioxide emission in stores and management according to sources (generators) at Fast Retailing for 2016 (tCO_{2e})

Store gas	11,436
HQ gas	38
Total Scope 1	11,474
Store electricity	123,932
HQ electricity	2,466
Total Scope 2	126,398

Source: Fast Retailing - Sustainability Report 2017, available at: http://www.fastretailing.com/eng/sustainability/report/pdf/sustainability2017_en.pdf#page=1&pagemode=thumbs&zoom=80

FastRetailingplanstoreducecarbondioxideemissionsinstoresby10%by2020(FastRetailing - Sustainability Report 2017, available at: http://www.fastretailing.com/eng/sustainability/report/pdf/sustainability2017_en.pdf#page=1&pagemode=thumbs&zoom=80.)

Conclusion

A growing number of retailers (food) in the world have been publishing reports on sustainable development. By their reputation, and because of its importance, other retailers will certainly tend to publish these reports in the future. It provides the basis for a comparative analysis of environmental performance in retail food from various aspects. In this report, special significance is given to trend of greenhouse gas emissions, in particular, carbon dioxide.

Carbon dioxide emissions in trade, in total and by sectors, vary by country. They are significantly higher in China than in Europe or the European Union. Likewise, carbon dioxide emissions are significantly higher in trade of France, Germany and Great Britain than in Greece, Croatia, Turkey and Serbia. Carbon dioxide emissions are higher in Croatian trade than in Serbian. These differences are due to the application of various ecological measures in business.

Carbon dioxide emissions differ in individual stages of the product life cycle, retail companies and product categories. Carbon dioxide emission generators in retail companies are as follows: electricity, transport, ventilation, heating and cooking, refrigeration, and waste. The goal of all retailers is to take appropriate measures, primarily ecological, to reach a planned reduction of carbon dioxide emissions in the future. Among other things, this is achieved with the increasing use of electricity from renewable sources (so-called “green energy”), by using modern ventilation, heating and cooking systems, refrigeration units, green logistics (ecological vehicles) and more efficient waste treatment. The effect of this is to improve the overall performance of retail companies (food), especially environmental.

Conflict of interests

The authors declare no conflict of interest.

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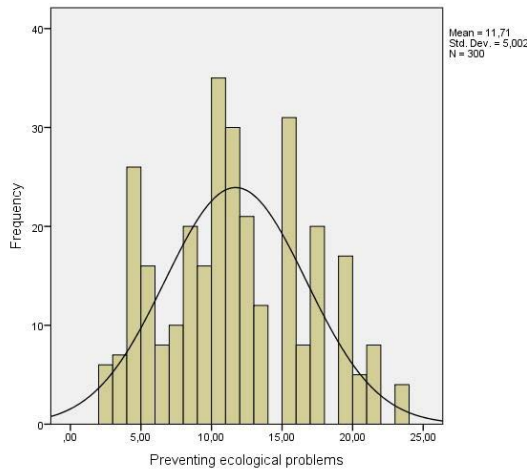
Table 1. The distribution cost of packaged goods from Subotica to retail-store objects

Indicators	Period			Total
	Month 1	Month 2	Month 3	
Distance crossed (km)	12.926	11.295	13.208	37.429
Fuel consumption (litre)	3.231	2.823	3.302	9.356
Value of fuel consumption (RSD)	242.378	211.790	247.653	701.821
Total time spend on touring (hour)	314	266	417	997
Value of total time spend on touring (RSD)	47.048	39.890	62.570	149.508
Number of tours	98	77	102	277
Toll value (RSD)	0	0	0	0
Number of pallets transported (piece)	1.179	976	1358	3.513
Total weight transported (kg)	602.600	429.225	711.116	1.742.941
Vehicle maintenance costs (RSD)	203.858	164.970	224.806	593.634
Lease costs (RSD)	480.938	454.214	565.784	1.500.936
Total sum (RSD)	974.222	870.864	1.100.813	2.945.899

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Figure 1. Agriculture, value added (% of GDP)



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