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CONTENT

RESOURCES AND POTENTIAL OF AGRI-FOOD PRODUCTS WITH ADDED VALUE IN BRANIČEVO-PODUNAVLJE REGION

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ABSTRACT

The paper explores the agricultural resources of the Braničevo-Podunavlje region and opportunities of agri-food products development with added value. In particular, the aim is to evaluate the following resources and potentials of the Region: the workforce and its knowledge and skills, used agricultural land, on-farm value-adding activities, local traditional food products, agricultural buildings and storage capacities and knowledge as well as innovation transfer in agriculture. In the research was used spatial and sectoral analysis of agricultural resources and potential for achieving more reliable answers to key questions that arise in the context of the analysis of value-added agri-food products in Braničevo-Podunavlje region. The research's results show that the use of comparative advantages and traditions, which the BP region has in the field of agricultural production presupposes the transformation of domestic agriculture and all forms of business entities in this activity. In the coming period, emphasis must be placed on the development of agri-food products with added value, which is focused on meeting the needs and wishes of consumers, with an emphasis on innovation, quality, high level of food hygiene and food safety standards.

Introduction

Changing consumer lifestyle habits in urban areas of developed and emerging economies create demand for more value-added foods. People spend less time on cooking, relying more heavily on ready-to-eat and partially prepared food products ranged from raw salad mixes to pre-prepared meals from the grocery store (Smith et al., 2013). On the other hand, people are increasingly health conscious and they are willing to pay premium prices for

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healthy food, functional food and nutraceuticals (The APO, 2012). According to Acharya et al. (2017), value addition is a process in which for the same volume of a primary product, a high price is realized by means of processing, packing, upgrading the quality or other such methods. Also, perceived value is an important factor in affecting consumers' attitude and purchase intentions (Hsu et al., 2018). The U.S. Department of Agriculture (USDA) defined value-added agriculture as follows:

- A change in the physical state or form of the product (such as milling wheat into flour or making strawberries into jam).
- The production of a product in a manner that enhances its value, as demonstrated through a business plan (such as organically produced products).
- The physical segregation of an agricultural commodity or product in a manner that results in the enhancement of the value of that commodity or product (such as an identity preserved marketing system) (The Agricultural Marketing Resource Center, 2015).

Relating the motivation of value-added agriculture to consumer preferences helps farmers to think beyond the conventionally-produced agricultural or food products and analyze the opportunities to be financially rewarded for creating value for consumers (Lu, Dudensing, 2015). Ready-to-eat, organic, traditional and regionally branded food, grown and processed on farms as well as healthy, nutritionally improved and quality upgraded food products, resulted from technological advances in food processing, packaging and tracking creates new opportunities for agribusinesses and entrepreneurs in the food industry. On-farm value-adding activities can increase the income of farming households, while off-farm ones can create allied enterprises with employment opportunities (The APO, 2012). It is necessary to reassess the existing and development of new business and marketing strategies of agricultural producers, based on developmental abilities and strengths of the producers themselves, but also on knowing consumers' preferences, new technologies, marketing approaches and other modern market postulates of economy. Additionally, farmers can help customers to better understand the products (Bonadonna et al., 2019).

The Republic of Serbia has favourable natural conditions for development of heterogeneous agricultural production, since it is located at the most favourable area of northern latitude. Together with climate, land represents the most important natural condition for development of agriculture. The agricultural land makes 65.6% of the Serbian territory (SORS, 2013a). In accordance to the 2012 Census of agriculture (SORS, 2013b), the Republic of Serbia disposes with 3,437,423 ha of used agricultural land (0.48 ha per capita). Even 73% of the used agricultural land are arable land and gardens. Free trade agreements (CEFTA, preferential export to the EU market, Free Trade Agreement with the Russian Federation, General Preferential System for the USA, etc), provide a chance to domestic producers and exporters to overcome the problem of small market along with realization of price competitiveness and increase of products quality. Almost a half of the total export directs to the EU market and realizes a significant surplus in exchange. The Free Trade Agreement with the Russian Federation provides a higher export of meat, milk and fruits on the

Russian market, and at the same time, it is one of the greatest assets Serbia has in attracting foreign investments[3]. The structure of agricultural and food exports is unsatisfactory ─ conventionally-produced raw agricultural commodities dominated the export. The most important export products of agricultural origin in 2017 were: *maize* (250.2 million euros), *raspberries, etc. frozen* (234.8 million euros), *cigarettes containing tobacco* (207.7 million euros), *fresh apples* (111.4 million euros) and *other fruits, uncooked, boiled, frozen* (95.4 million euros) (CCIS, 2018). Basic limiting factors for more significant and more efficient inclusion of food industry in the international market are:

(a) low level and structure of agricultural production, its high extensiveness, oscillation and low productivity, along with inefficient organization of trading channels, absence of long-term and firm contractual relations or proprietary connection between agricultural producers and food industry and insufficient respect of market signals.

(b) insufficient assortment of food products and insufficient level of added values to the products through greater role of knowledge, innovations, etc as well as different level of technical-technological equipment of food industry sectors (the most was invested in industry of oil, beer, dairy, confectionary and water processing while less investments were registered in industry for processing of sugar, meat, fruits and vegetables).

(c) vacillation of market products quality, whether due to lack of standards, or due to disrespect and weak control of the existing standards.

In the coming period, Serbian agrarian policy must be placed emphasis on the development of the food industry that is focused on meeting the needs and desires of consumers, with an emphasis on innovation, quality, high standards of food hygiene and food safety (Mihailović, Brzaković, 2018). Competitiveness of the national agro-food sector is based on the use of quality standards in the supply chain (Ćoćkalo et al, 2019). The guarantee of food safety and quality is a basic presumption for successful access to the domestic and foreign markets (Popović et al, 2017). There are great potentials for development of organic agriculture and organic foods which main characteristic is high quality, and for which is very interested international market (Simić, 2017). International market is also interested for high-value local, exotic or traditional agricultural and food products with protected geographical indications. Geographical indication is a sign used on products that have a specific geographical origin and possess qualities or a reputation that are due to that origin (WIPO, 2019). The legal certainty and reduction in unfair competition improve market access and increase prices of GI products (Vandecandelaere et al., 2018).

In addition to favorable natural conditions**,** BP region has a knowledge and tradition in agriculture, but the competitiveness of the sector is weak. Various weaknesses are present

3 All the advantages of free trade with the Russian Federation and other member-countries of the Customs Union (Byelorussia, Kazakhstan), Serbia should use until it accesses the EU, because after that, the signed free trade agreements will not take effect anymore.

in the value chain, from low level of producer organization and innovative food processing to insufficiently expert and thoughtful marketing and promotion of regional products (RDA BP, 2011). According to the same source, food processing sector is characterized by exceptional diversity, so in the region there are dairies, slaughterhouses, confectionery, mills, production of alcoholic and non-alcoholic drinks, etc. However, there are still a number of unused potentials and opportunities for new investments in the food industry.

Materials and methods

An analysis of the resources and potential of agri-food products with added value in the BP region is based on the following data sources: available statistical data and statistical surveys of the Statistical Office of the Republic of Serbia, strategic development documents of the Republic of Serbia and the BP region, the Garden of Serbia project results of Regional Development Agency "Braničevo-Podunavlje" (2011) and researches of domestic and foreign authors in this thematic field. In the research was used spatial and sectoral analysis of agricultural resources and potential for achieving more reliable answers to key questions that arise in the context of the analysis of value-added agri-food products in Braničevo-Podunavlje region.

Results and Discussion

Braničevo-Podunavlje as the dominant rural region, characterized by rich natural resources, cultural and historical heritage, good geographical connection with key transport routes and international corridors, diversity of potentials for the development of various economic activities. Agriculture is one of the most important segments of the economy of the BP region, which, despite its potentials, is underused (RDA BP, 2016). Natural diversity has caused the development of different types of agricultural production (fruit and vegetables growing, cattle breeding), which are the basis for further development of the sector, respecting the requirements of the market and international standards. Traditional food processing industry in the BP region has lost significance during the privatization process.

The workforce and its knowledge and skills are certainly the most valuable resource for development of agriculture and food industry in BP region. Namely, in this Region there are a total of 9,247 registered individual farmers (SORS, 2018). Also, 45,824 managers at holdings are registered in total (SORS, 2013c). The level of qualifications is as follows: 33,043 managers have an only practical agricultural experience and 326 managers attended at agricultural courses. Agriculture, forestry and fishery sector employs 1.8% of total regional economy employment. The highest percentage of employees in BP economy is recorded in the processing industry (25.3%) (SORS, 2018). In order to improve the competitiveness of the agricultural sector and encourage rural development in BP region it is necessary to implement adequate strategic measures and projects in the field of human resources development that include a greater connection between science and practice through reorganized advisory services, agricultural cooperatives and other associations of farmers, development and implementation of

new knowledge and skills of farmers through advice, training, seminars, courses and support to young farmers in the modernization of the farm.

Used agricultural land. Fertile arable land prevails in the area of Stig plain, located between the City Pozarevac and the municipalities of Veliko Gradiste, Petrovac na Mlavi and Malo Crniće. In the eastern, forested hilly-mountainous part of the region, agricultural land is of lower grade, but there is a significantly higher share of meadows and pastures (RDA BP, 2011). The structure of used agricultural land of holdings in BP region is: kitchen garden 1,483 ha, arable land 166,985 ha, meadows and pastures 28,880 ha, fruit plantations 10,314 ha; vineyards 1,367 ha, nurseries 22 ha and other permanent plantations 33 ha (Table 1,2).

Table 1. Used agricultural area of holdings in BP region, by categories

	AH	UAA, ha	Kitchen garden		Arable land		Meadows and pastures	
			AH	ha	AH	ha	AH	ha
Branicevo reg.	26,361	135,748	12,959	838	24,433	105,186	11,991	25,025
City of Požarevac	5,043	24,981	2,649	142	4,386	23,319	917	938
Požarevac	4,427	22,666	2,264	120	3,857	21,107	871	923
Kostolac	923	2,315	385	22	529	2,212	46	15
V.Gradište	2,587	17,691	1,226	62	2,415	15,667	1,118	1,459
Golubac	1,385	6,416	586	35	1,325	4,436	662	1,698
Žabari	2,236	13,144	1,027	77	2,120	11,822	385	713
Žagubica	3,145	18,893	1,451	69	2,985	6,956	2,612	11,260
Kučevo	3,668	11,622	2,296	180	3,370	5,972	2,646	4,940
Malo Crniće	2,401	14,778	1,022	70	2,252	13,706	899	653
Petrovac na Mlavi	5,896	28,221	2,702	205	5,580	23,309	2,752	3,362
Podunavlje reg.	18,800	73,336	10,525	645	16,858	61,799	3,739	3,855
Velika Plana	5,225	18,994	3,344	210	4,860	17,481	423	777
Smederevo	6,877	26,560	3,149	172	5,708	20,514	1,008	1,077
Sm. Palanka	6,698	27,782	4,032	262	6,290	23,803	2,308	2,001
BP region	45,161	209,084	23,484	1,483	41,291	166,985	15,730	28,880

Source: SORS, 2013b

Table 2. *Used agricultural land of holdings in BP region, by categories*

	Permanent plantations							
	Fruit plantations		Vineyards		Nurseries		Other	
	AH	ha	AH	ha	AH	ha	AH	ha
Branicevo region	12,461	4,020	5,445	638	31	14	122	27
City of Požarevac	1,851	478	884	99	6	6	2	0
Požarevac	1,630	426	789	87	5	6	3	0
Kostolac	221	52	95	11	1	3	-	-
Veliko Gradište	1,221	390	893	113	-	-	4	1
Golubac	637	179	481	65	2	0	11	2

	Permanent plantations							
	Fruit plantations		Vineyards		Nurseries		Other	
	AH	ha	AH	ha	AH	ha	AH	ha
Žabari	1,158	423	583	106	4	2	2	0
Žagubica	1,730	603	70	5	-	-	-	-
Kučevo	1,530	471	645	52	4	4	7	3
Malo Crniće	1,037	300	491	49	-	-	-	-
Petrovac na Mlavi	3,297	1,175	1,398	149	15	2	96	19
Podunavlje region	6,813	6,294	3,198	729	10	8	11	6
Velika Plana	1,370	398	750	126	-	-	4	1
Smederevo	2,912	4,412	1,313	381	3	3	2	1
Smed. Palanka	2,531	1,484	1,135	221	7	5	5	5
Total BP region	19,274	10,314	8,643	1,367	41	22	133	33

Source: SORS, 2013b

Production structure (Census of Agriculture, SORS, 2013b):

- From vegetable crops, on the largest number of areas are grown carrots, cabbage, kale and carfiol, which participate in the total area at the national level from 6,16-7,78%. Within the Region, the most important areas are those under paprika, bostan and peas. Out of a total of 33,232 ha of areas under vegetable crops that are concentrated in Smederevo, Velika Plana and Veliko Gradište, only 6.27% are protected areas.
- With areas under orchards, the Region (primarily Smederevo, Smederevska Palanka and Petrovac on Mlava) participates in the national scale with approximately 6%, of which as many as 28.33% of peach plantations and 9.08% of apple crops in Serbia are in the Region, as and 8.31% of the total walnut plantations at the national level.
- In addition to these significant areas in the Region, they are under planted plums, cherries and pear trees. Although the share of the Region, when the area under vineyards is only 6,17% of the total area at the national level, viticulture has been on the rise for the last decade.
- For the purposes of the used agricultural land dominated by fields and gardens that cover almost 80% of the area, where fodder plants (clover and alfalfa) and cereals (wheat and barley) are mostly grown. They are least represented in mountainous rural areas (Žagubica, Kučevo, Golubac), where dominant meadows and pastures, that is, forest land that makes up almost 14% of the total available agricultural land of the Region.

On-farm value-adding activities are poorly developed. Only 3,259 or 7.1% of households are engaged in some additional profitable activity, which is significantly lower than national average of 12.4% (SORS, 2013c). Approximately 80% deal with different types of processing of agricultural products, of which the most important is the milk processing sector (Table 3).

Table 3. Agricultural holdings dealing with the processing of agricultural products

Region / District / Municipality	AH	meat processing	milk processing	processing of fruits and vegetables	processing of other agricultural products
Braničevo	1,980	138	1,099	138	172
Požarevac	469	6	373	21	8
Veliko Gradište	107	5	36	6	1
Golubac	187	6	135	18	7
Žabari	233	3	36	30	1
Žagubica	281	7	156	5	7
Kučevo	190	1	106	6	19
Malo Crniće	172	3	103	14	9
Petrovac na Mlavi	341	107	154	38	120
Podunavlje	1,279	93	663	264	69
Velika Plana	316	60	88	54	45
Smederevo	411	21	248	105	16
Sm. Palanka	552	12	327	106	8
BP region	3,259	231	1,762	402	241

Source: RDA BP, 2016

Natural diversity has caused the development of different types of agricultural production (farming, vegetables, fruit growing, cattle breeding), which are the basis for further development of the sector, while respecting the requirements of the market and international standards (RDA BP, 2016).

Organic production is significantly represented: according to the records of the Ministry of Agriculture and Environmental Protection, in 2014, 5 producers from the region were involved in organic production (293 at the level of Serbia), mainly plant production of berries, mushrooms, self-herbs and aromatic plants, but also seed production of several products mentioned (RDA BP, 2016). Organic agriculture gets more and more important by bringing man closer to nature, from which he has grown, he also makes almost complete harmony with the requirements of environmental protection and finally, enables the population to feed products that are produced by natural processes, using organic and mineral matter. Promotion and sale of organic products require particular approach to introduce customers about the branding, packaging and advantages in comparison to conventional products (Dašić et al., 2019).

In the Region, several *local traditional food products* are produced (cheese, honey, brandy and wine, various meat products, etc.). Some of them have registered indications of geographical origin (Appelation of Origin - AO or Geographical indication - GI)[4]:

- Požarevačka kobasica - Sausage from Pozarevac (Appelation of Origin - AO, Geographical area: Region along the Danube River),

4 According to the Law on Indications of Geographical Origin (Official Gazette of the Republic of Serbia – OG RS, No 18/2010).

- Homoljski ovčiji sir - Sheep cheese from Homolje (AO, Geographical area: District of Branicevo, municipality Zagubica in the mountains of Homolje).
- Homoljski kozji sir - Goat cheese from Homolje (AO, Geographical area: District of Branicevo, municipality Zagubica in the mountains of Homolje).
- Homoljski kravlji sir - Cow cheese from Homolje (AO, Geographical area: District of Branicevo, municipality Zagubica in the mountains of Homolje).
- Homoljski med - Honey from Homolje (AO, Geographical area: The mountains of Homolje).
- Đerdapski med - Djerdap honey (GI, Geographical area: Djerdap area) (The IPO of the RS, 2016, 2019).

These products are recognizable at the national level and also have the potential for developing new (niche) export markets. It is necessary to support agricultural holdings with market propulsion and export programs of agricultural production.

Other profitable activities participate in the income of almost 60% of households with less than 10%, and only about 5% of them generate more than 50% of their income (RDA BP, 2016).

Agricultural buildings and storage capacities in BP region. Farms of the BP region registered the following number of storage and processing capacities (Table 4).

Table 4. Agricultural buildings and storage capacities at holding in BP region

Storage and processing capacities	Braničevo region		Podunavlje region	
	Total	Used capacities	Total	Used capacities
Maize cribs, м^3	21,017	421,404	13,439	216,803
Barns, м^3	9,271	129,575	6,978	94,215
Silos, т	128	37,330	85	3,997
Drying facilities, м^3	36	6,809	18	1,596
Buildings for storing silage, м^3	790	37,456	868	38,188
Buildings for agricultural machinery and equipment, м^2	15,356	894,258	7,416	372,074
Coolers, м^3	71	2,798	342	54,295
Building for cattle housing, number of places	16,932	34,951	8,976	19,891
Buildings for housing pigs, number of places	24,114	173,491	15,124	105,731
Facilities for lying hens, number of places	13,613	454,343	8,459	552,773
Buildings for housing other livestock, number of places	9,736	180,608	4,272	97,469
Machine calibration and vacuum packing	22	19	26	24

Source: SORS, 2013c

Launchers of the food industry and the agro-business sector are: “Bambi”, “Water escargot”, “Union MZ, Požarevac”, “Ishrana Smederevo”, “Zitostig”, “Fruvita”, “Vodeprodukt”, “100%”, “Slaughter Plan” and “Napredak” A.D. Velika Plana (MSP-

NE SERBIA, 2009). Lately, some new companies are emerging in the region - examples of good practice in food production, which the volume of production by taking over the holdings and progressing in the value chain from production to processing and marketing in food production. However, the number of processing capacities is insufficient.

Bearing in mind the insufficient industrial capacities for the processing of agricultural products, it is necessary to support the development of new processing capacities according to the available raw commodities and market demands. This can be achieved by investing in the production, marketing and introduction of a quality system in accordance with EU standards. It is necessary to foresee the development of a program of production that would include all phases of the reproduction unit starting from primary production, through industrial processing and transport to the consumption of all major agricultural products.

Looking at trends in the international market, and bearing in mind the achieved level of production and competitiveness of domestic producers, it can be concluded that, on the assumption of meeting the quality control standards on the world market in terms of export of agricultural products, we are competitive only if we differentiate the offer, in terms of export of high quality products, with brand and / or indices of autochthonous origin. Namely, domestic producers of agro-food products can only build their export opportunity using the modern concept of competitiveness, which means creating a competitive advantage with quality and innovation, and differentiating the offer. In the following period, agrarian policy must emphasize the development of the food industry aimed at satisfying the needs and wishes of consumers, with an emphasis on innovation, quality, high standards of hygiene and food safety and food safety (Mihailović, Brzaković, 2018). There are great opportunities and potentials for the development of the domestic food industry in the field of organic foods production whose main characteristic is high quality, and for which the international market is very interested.

Knowledge and innovation transfer in agriculture. There is a relationship between knowledge management capabilities and successful open innovation within agri-food businesses (Cillo et al., 2019). Rapid technological development and innovation offers the prospect of meeting future food needs sustainably. However, this can only be achieved through discerning public policies, increased investments and public-private partnerships, which exploit the opportunities for maintaining current levels of productivity, sustainably raising yields, and reducing poverty and food insecurity (FAO, 2017). Response to these changes requires significant investment by the food industry in research and development, plants and equipment, and consumer outreach (Nikolić, Brankov, 2018). The quality of equipment and techniques for research in Serbia lags behind the European average. Although, the existing scientific and educational institutions have relatively high quality personnel, who had achieved a series of internationally recognized results: new sorts and breeds, scientific papers and technical solutions (MAEP, 2014). Product and service innovation has the greatest share in innovations introduced in the Republic of Serbia (26.9%). The largest share of expenditures goes for procurement of machines, equipment and software (71.4%). State financial support (in the form of tax credits, grants, subsidized loans or loan guarantees) was given to 12.5% of business entities – innovators (SORS, 2017).

Transfer of knowledge in agriculture conducts through the system of formal education at all levels (from secondary education to PhD studies) and different forms of trainings organized by the educational and research institutions and organizations, AESSs, private companies, project units, media, etc. According to the Strategy of Agriculture and Rural Development of the Republic of Serbia 2014-2020 (OG RS, No. 85/14), the existing structure and the system of knowledge transfer are not sufficiently efficient to meet adequately the needs for more dynamic technical-technological restructuring of agricultural sector.

There is obviously a lack of knowledge and sources for introducing new technologies in agricultural production of BP region, although there are educational and R&D institutions related to agriculture (Vegetable Institute, Veterinarian Institute for Reproductive and Artificial Insemination, Veterinary Specialist Institute, Superior Seeds, Institute for Agriculture in Pozarevac and Smederevo and Secondary and Higher Agricultural Schools (MSP-NE SERBIA, 2009). The possibilities provided by the private-public partnerships and other actors (cooperative associations, private consulting economic entities and agencies, NGO sector and others) have not been used. Therefore it should support the workshops, conferences, demonstration activities, information activities and the programs of short-term exchange or visit to the agricultural holdings.

Conclusions

The use of comparative advantages, which the BP region has in the field of production of agri-food products with added value presupposes the transformation of domestic agriculture and all forms of business entities in this activity. These transformation processes must go towards rethinking existing and developing new business and marketing strategies of agricultural producers, based on the developmental abilities and strengths of the manufacturers themselves, but also on the knowledge of consumer preferences, new technologies, marketing approaches and the use of quality standards as a basic presumption for successful access to the domestic and foreign markets.

In such conditions, respecting the market approach, that is, constant and intense changes in the market, is the first and basic assumption in which there would be a rational formulation of new marketing strategies, different from competitors precisely in terms of inventiveness, technology and quality. By producing competitive agri-food products, agriculture in th BP region would ensure sufficient income for family farms, focusing its activities on meeting the needs and preferences of consumers and working closely with the food processing industry.

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Conflict of interests

The authors declare no conflict of interest.

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FORECASTING CORN PRODUCTION INDICATORS IN THE REPUBLIC OF SRPSKA

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ABSTRACT

The aim of this paper is to formulate quantitative models to predict future trends in corn production in the Republic of Srpska. The applied research methods are the descriptive analysis method, and the analytical statistical method, i.e. the Box-Jenkins Model based on the ARIMA model (*Autoregressive Integrated Moving Average*). The results of the research show that the corn production indicators, as the most important crop in the Republic of Srpska, will, despite the oscillations, show an increase in the last year of the five-year prediction period (2018-2022) compared to the previously analysed twenty-two year period (1996-2017). The formulation of such forecasting models is a good basis for planning the overall crop production in the Republic of Srpska.

Introduction

The Republic of Srpska, as one of the two entities in Bosnia and Herzegovina, belongs to a rural area characterized by a traditional agriculture with small and mixed types of household, and in whose overall structure of primary agricultural production, crop production is of the highest importance. Crop production is distinguished by the diversity of products used for human and animal food, or as raw materials for industrial processing. In addition, it covers most of the annual plants, so that its structure can

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easily and quickly be changed and adjusted to the conditions of a particular area-region, than in the case of permaculture and viticulture (Maletić, 2010).

In the structure of crop production in the Republic of Srpska, crops occupy a central place with a share of as much as 67.0% in total sown arable areas (*The Institute of Statistics of the Republic of Srpska*). Crops are of great commercial significance due to the fact that they are easily stored and transported, and are often subject to state interventionism, purchase and sale from state reserves or regulation of exports and imports.

According to the Institute of Statistics of the Republic of Srpska, corn is the most widespread crop on the arable land, and its share in the structure of areas under crops is more than two thirds (65.6%). According to the same source, the production of corn in 2017 was 497,501.0 tons, which is 302,186.0 tons more than wheat, as the next most abundant crop in the Republic of Srpska. It should be pointed out that the economic significance of corn is reflected in the possibility of exploiting almost all of the overground biomass of plants. With various technological processes it is possible to produce more than 1500 various industrial products from the corn plant (Glamočlija, 2012). Corn is increasingly used for the production of bioethanol and biodegradable plastics (Torney et al., 2007; Schgiwietzke et al., 2008), while in underdeveloped and developing countries, corn is primarily used for human consumption, with the predicted rate of increase from 1.3% by 2020 (Ortiz et al., 2010). Based on global forecasts, corn will become crop with the largest production by 2025, and the need for this culture will be doubled in developing countries by 2025 (Rosegrant et al., 2008).

Due to economic significance of corn in the Republic of Srpska, it is necessary to pay more attention to the future trends of its production. According to Mutavdžić (2009) in the market conditions of the economy, successful production depends on monitoring, analysis and forecasting of both the results and the most important factors affecting it. For this reason, the aim of the paper is to formulate quantitative models to anticipate future trends in corn production in the Republic of Srpska.

In previous surveys, many models of forecasting have been formulated in agriculture. Bearing in mind that the prediction was based on time series data, the applied models were from the class of ARIMA model that are widespread in the field of prediction. There are a large number of publications that have examined their implementation and validity.

When it comes to forecasting corn production in Serbia using the ARIMA model, Ilić et el., (2016) have constructed a model by which it is possible to determine the trend of the production of this crop in the upcoming period based on the previous time series. Suleman and Sarpong (2012) carried out modelling and forecasting of the production and consumption of corn in Ghana using the ARIMA model, while Badmus and Ariyo (2011), based on the time series of data and the application of the ARIMA model, performed the prediction of arable land and corn production in Nigeria until 2020. In addition to these, several other authors have been engaged in prediction of corn production during past years (Busay et al., 2015; Wei et al., 2015; Santosha et al., 2017; Sharma et al., 2018; Li and Zhu, 2018). In addition to corn production, the use of ARIMA model

for the purpose of forecasting future production trends was also used in other crop species (Amin et al., 2014; Ramesh, 2015; Hossain and Abdulla, 2015; Iqbal et al., 2016).

In their research, some authors dealt with the forecasting of production parameters and other agricultural productions, such as cattle production (Novković et al., 2006), then vegetable production (Novković et al., 2013; Mutavdžić et al., 2014; Ivanišević et al., 2015; Mutavdžić and Novković., 2016), and the forecasting of economic parameters of agricultural production, such as price and price parity (Adanacioglu and Yercan, 2012; Mutavdzic et al., 2016; Novković et al., 2016; Jadhav et al., 2017).

Materials and methods

The defined objective of the research in the paper imposed the need to apply the appropriate research methods, namely:

- Descriptive analysis method, and
- Analytical and statistical methods.

The method of descriptive statistics was used for the analysis of the observed corn production indicators in the period 1996-2017 and includes basic statistical indicators such as the average value of the phenomenon, the variation interval (minimum and maximum), the coefficient of variation and the rate of change.

For the purpose of predicting the observed production parameters, autoregressive integrated processes of moving environments (ARIMA models) based on the analysis of time series were applied. The analysis of the time series refers to the observed twenty-two-year period, while the forecast relates to the next five-year period (2018-2022).

The general strategy for ARIMA modelling was drafted by Box and Jenkins (1970). The stages from which this methodology is composed of are:

- Model identification,
- Estimation of model parameters, and
- Checking the model adequacy

Model identification is a key step in the Box-Jenkins methodology, where the order of differentiation is determined, as well as the choice of the appropriate model and the order of the process. A narrow selection of several ARIMA models is performed on the basis of the graphic representation, where there is a need to perform the appropriate transformation of the initial values if the series contains a trend, a season, a variable variance, and the like. For this purpose, logarithmic transformation or differentiation is most often used in order to achieve stationarity. In addition, in order to determine the order of differentiation, common and partial autocorrelation functions are used, and in addition, the unit root test can be applied, and most often it is Dickey-Fuller test. Thereafter, based on the calculated ordinary and partial autocorrelation function, lines p and q are identified, which provides a temporary model.

At the stage of estimation of model parameters, the parameters are evaluated using simple least squares (AR models) or non-linear least squares method (MA and ARMA models).

Checking the model adequacy implies checking the model's conformity with existing data as well as checking the adequacy of selected AR and MA components of the model. At this stage, the basic assumption of the model, whose fulfilment is checked, is that the random independent size of the is a white noise process with a mean zero and a constant variance. For the assessment of adequacy, a series of residues is analysed, which should have a normal distribution. For this purpose, the Jarque-Bera test is used. In addition to the basic assumption in selecting the model, it is necessary that the autocorrelation coefficients of the residual series are equal to zero. In doing so, the significance of individual autocorrelation coefficients can be tested or there can be performed a test of the hypothesis that all autocorrelation coefficients of the residual are equal to zero, using Box-Pierce statistics (Mutavdžić, 2009).

The series of observed phenomena in this paper were taken or formed on the basis of the available statistical publications of the Institute of Statistics of the Republic of Srpska, and all data processing was carried out with appropriate statistical software.

Results and discussions

In the analysed period, corn recorded a slight tendency of growth when it comes to all three measurements of production indicators. The average harvested area in the analysed twenty-two-year period was slightly over 141 thousand hectares, and was characterized by stability in its movement, which can be concluded from the calculated variation coefficient. Corn harvested area varied in the range of about 121 thousand hectares to almost 159 thousand hectares (*Table 1.*).

The average production of corn was about 592 thousand tons, and in relation to the harvested area, it showed unstable trend for the analysed period. Corn yields ranged from 2.3 to 6.4 tonnes per hectare, with an average of about 4.2 tonnes per hectare and a very similar trend of growth and stability of movement as well as production (*Table 1.*).

Table 1. Basic corn production indicators in the Republic of Srpska (1996-2017)

Production indicators	Average value	Variation interval		Variation coefficient (%)	Change rate (%)
		Minimum	Maximum		
Area (ha)	141.021	120.901	159.328	6,19	0,61
Production (t)	591.832	359.453	880.997	24,32	0,75
Yield (t/ha)	4,18	2,31	6,40	24,68	0,79

Source: Author's calculation

The model for the analysis and forecasting of the corn harvested area shows that the corn area in the previous year had statistically significant influence on the area of the corn in the current year, as well as the random process from the previous year (*Table 2.*).

Table 2. Model for forecasting corn harvested area

Paramet.	**Input: Corn haravested area** **Transformations: D (1)** **Model: (1,1,1) MS Residual=8357E4**					
	Param.	Asympt. Std.Err.	Asympt. t(18)	p	Lower 95% Conf	Upper 95% Conf
Constant	972,8894	2223,800	0,43749	0,666960	-3699,14	5644,920
p(1)	-0,8074	0,232	-3,47368	0,002711	-1,30	-0,319
q(1)	-0,9424	0,129	-7,29943	0,000001	-1,21	-0,671

Source: Author's calculation

The value of the corn harvested area based on the model shows an increase over the entire prediction period. At the end of the forecast period, it will be about 2.7% higher than the average corn harvested area achieved in the analysed period (*Table 3*.).

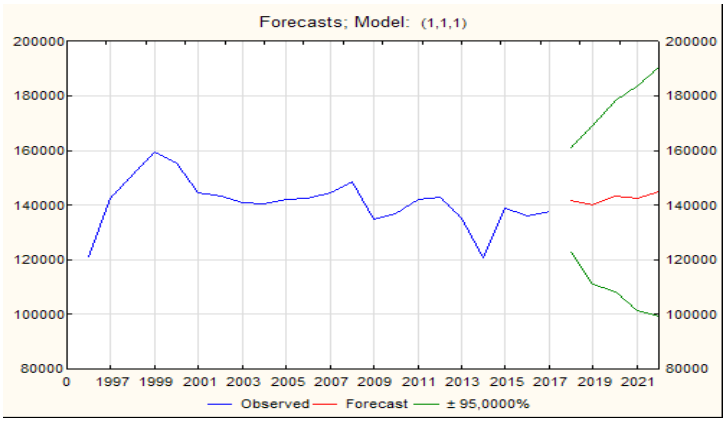
Table 3. Forecasting the corn harvested area (2018-22)

Years	**Forecast; Model: (1,1,1)** **Input: Corn harvested area** **Start of origin: 1 End of origin: 22**			
	Forecast	Lower 95,0000%	Upper 95,0000%	Std. Err.
2018	141811,6	122606,2	161017,1	9141,44
2019	140252,7	111200,6	169304,8	13828,25
2020	143269,8	108165,6	178374,0	16708,94
2021	142592,1	101481,8	183702,5	19567,77
2022	144897,7	99167,2	190628,2	21766,87

Source: Author's calculation

The graphical representation of the trend of corn harvested area confirms the observed oscillations from the analysed period, as well as the fairly stable expected area values in the prediction period (*Figure 1*.)

Figure 1. The trend of corn harvested area



Source: Author's calculation

The selected and estimated ARIMA (2,1,0) model for the analysis and forecasting of corn production shows that the production of corn in the current year is under a statistically significant impact of the level of production from the previous year, but only if the analysis includes the production from the previous two periods (*Table 4*.).

Table 4. Model for forecasting corn production

Paramet.	**Input: Corn production** **Transformations: D (1)** **Model: (2,1,0) MS Residual=3280E7**					
	Param.	Asympt. Std.Err.	Asympt. t(18)	p	Lower 95% Conf	Upper 95% Conf
Constant	9235,586	18335,64	0,50370	0,620584	-29286,2	47757,33
p(1)	-0,873	0,23	-3,77034	0,001401	-1,4	-0,39
q(1)	-0,410	0,24	-1,64490	0,110645	-0,9	0,10

Source: Author's calculation

Predicted values of corn production in the following period show oscillations from year to year of the prediction period. The expected increase in corn production in the last year of the prediction period will be around 702,500 tons, which is about 111,000 tons more than the average production of corn in the analysed period (*Table 5*.).

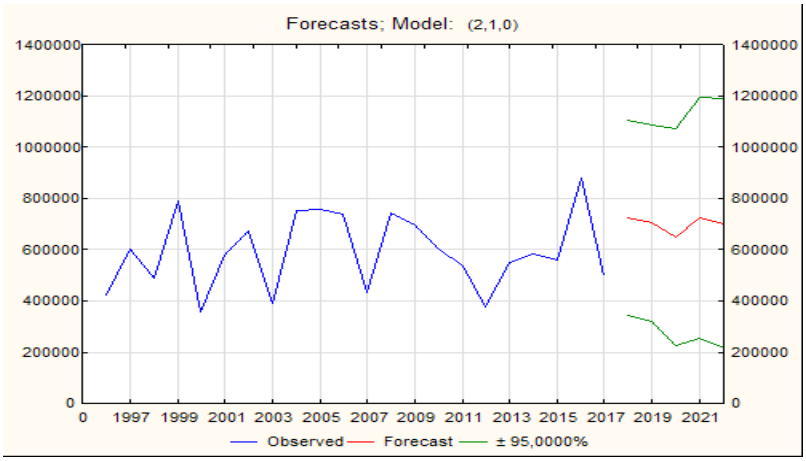
Table 5. Forecasting the corn production (2018-22)

Years	**Forecast; Model: (2,1,0)** **Input: Corn production** **Start of origin: 1 End of origin: 22**			
	Forecast	Lower 95,0000%	Upper 95,0000%	Std. Err.
2018	722468,0	341957,9	1102978	181115,8
2019	704260,9	320713,7	1087808	182561,4
2020	649038,4	224299,3	1073777	202167,9
2021	725820,4	255752,5	1195888	223743,6
2022	702481,7	214817,4	1190146	232119,1

Source: Author's calculation

The indicated characteristics of corn production are confirmed by the graphic representation of the production trend in the analysed period, as well as in the forecasting period (*Figure 2*.).

Figure 2. Trend of corn production



Source: Author's calculation

Model for forecasting corn yield shows that the yield of the previous year has a statistically significant impact on the current year's yield (*Table 6*.).

Table 6. Model for forecasting corn yield

Paramet.	**Input: Corn production** **Transformations: D (1)** **Model: (2,1,0) MS Residual=3280E7**					
	Param.	Asympt. Std.Err.	Asympt. t(19)	p	Lower 95% Conf	Upper 95% Conf
Constant	0,067350	0,185569	0,36294	0,720659	-0,32105	0,455750
p(1)	-0,650440	0,205611	-3,16346	0,005116	-1,08079	-0,220092

Source: Author's calculation

Predicted yield values based on the selected ARIMA model (1.1.0) show yield fluctuations from year to year of the prediction period. Regardless of the observed oscillations at the end of the forecast period, the yield of corn will be around 5.2 t/ha, which is one ton more than the average corn yield from the analysed period (*Table 7*).

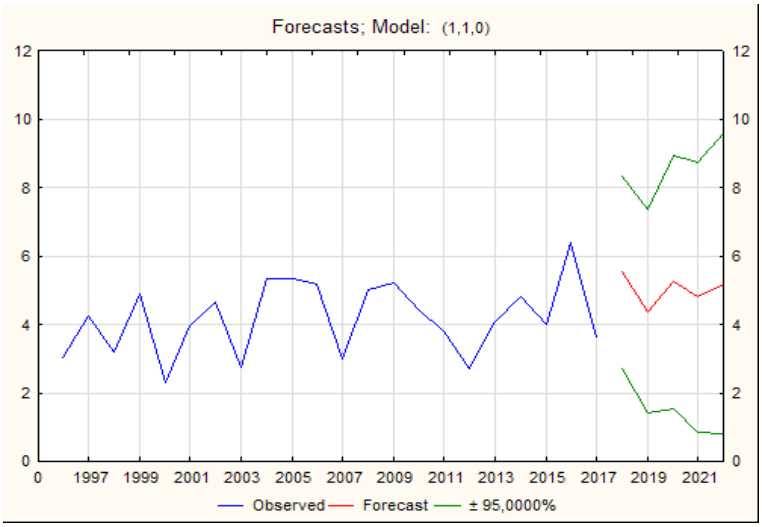
Table 7. Forecasting corn yield (2018-20)

Years	**Forecast; Model: (1,1,0)** **Input: Corn yield** **Start of origin: 1 End of origin: 22**			
	Forecast	Lower 95,0000%	Upper 95,0000%	Std. Err.
2018	5,532389	2,720472	8,344307	1,343471
2019	4,386642	1,407878	7,365406	1,423187
2020	5,243039	1,556152	8,929925	1,761512
2021	4,797160	0,853845	8,740475	1,884027
2022	5,198334	0,820243	9,576425	2,091754

Source: Author's calculation

The corn yield is characterized by oscillations in both the analysed and the forecasting period which can be seen in a graphical presentation of the corn yield trend. The graphic representation also shows the tendency to increase yields in the prediction period (*Figure 3.*). It is opposite if we compare with Romania where authors Vasilescu et al. (2010) proved that corn and sunflower is less efficient than if we use extensive methods of production.

Figure 3. Corn yield trend



Source: Author's calculation

Conclusions

Based on the research of the time series of data and the formulation of adequate models for forecasting in this paper, the following can be concluded: reached levels of production indicators from the previous year, as well as the random processes, have the statistically significant influence on the trend of corn production indicators in the next five year period (2018-2022), taking into consideration the fact that corn is the most important crop in the Republic of Srpska. With the indicated oscillations in the next five-year period, it is expected that the corn harvested area in the last year of the prediction period will be 144,898 ha, which is 2.7% more than the average value in the previously analysed period. Also, during the entire period of forecasting and production of corn oscillations are present, while the production is expected to be at the level of about 702,482 tons in 2022, which is 16% more than the average value recorded in the period 1996-2017. Like the previous two indicators, the expected corn yield shows an increase in the last year of the forecast period and will amount to 5.2 t/ha.

Conflict of interests

The authors declare no conflict of interest.

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EFFICIENCY VERSUS COMPETITIVENESS IN ROMANIAN AGRICULTURE. CASE STUDY

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ABSTRACT

The paper investigates the relationships between agricultural productivity, efficiency and farm's competitiveness, trying to find out to what extend the farm's activity is both efficient and competitive? The research starts from the assumption that a farm can be economically inefficient but competitive, and, reciprocally, an economically efficient farm is not necessarily competitive. A case study of a farm from North-West Romania has been considered. It was found that, although the overall activity of the farm is inefficient in some agricultural years, for certain crops, the farm is competitive in those regarding prices and yields. The analysis goes deeper to compare crops between them and proposes solutions for increasing farm's efficiency by replacing inefficient crops to efficient ones, using the method of balance of gains and losses. The results of the research are useful in helping farmers making their decisions regarding the structure of production.

Introduction

Agricultural performance is at the center of many debates, policies and analysis concerning the farming sector. Global initiatives, such as the 2030 Agenda for Sustainable Development, placed agricultural productivity among other global issues. Growths in agricultural yields eases pressure on land use and raising the productivity of agricultural labor in developing countries, strengthens income and stimulates economic development (Fuglie, 2018). By reducing the quantities of inputs needed to produce food, higher agricultural productivity makes food cheaper and has a propagated e□ect on poverty reduction.

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Predictions estimated that world population will rise, therefore it is expected that the global demand for food to increase, which will intensify the competition for scarce natural resources. Accordingly, the food production must increase. Since the land is limited, the agricultural output should grow intensively, by increasing productivity. Major increases in efficiency are needed to meet the land and water scarcity in agriculture (Hong et al. 2019), especially as the demand for these resources from non-agricultural sectors, such as biodiesel industry, is also rising (Dusmanescu et al., 2014).

In Romania, agriculture plays a significant role within the economy, considering the large agricultural area of 8,409,242 hectares under cultivation, representing 0.43 hectares per inhabitant, and the share of 4.8% of agriculture in GDP, in 2018 (National Institute of Statistic, 2019). The main crops cultivated are cereals (65% of the agricultural area) and oil crops (19% of the agricultural area). Among cereals, corn and wheat are the most cultivated. Corn holds 30% of total cultivated area and wheat holds 25%. Among oil crops, sunflower holds 12% of total cultivated area, rape 5.4% and soybeans 1.5%. The areas cultivated with oil crops have grown over the last years, as a result of increasing demand for biodiesel (Andrei et al., 2016).

Agriculture in Romania is characterized by numerous small family holdings and only several commercial farms. There are 3,342,185 agricultural exploitations in Romania, of which 351,894 hold under 1 hectare and 555,396 hold between 1 and 3 hectares. Only 12,310 farms exploit 100 hectares and over (National Institute of Statistic, 2019). Given that there are many types and forms of holdings, most of them family farms, the economic performance in agriculture is difficult to be assessed. When speaking about performance, productivity, efficiency and competitiveness, as its main components (Ion, 2005), are envisaged. The study of performance implies numerous economic and financial data on revenues and expenses registered in accountancy and many farms do not hold a system of bookkeeping. Small family farms hold empirical management, a minimum level of accounting, the quality of commodities largely varies (Soproni et al., 2008) or there are regional differences in labor expenditure and consumption (Voicu, Dobre, 2003). This is the reason why, when measuring performance, the commercial farms are investigated. In their cases, the characteristics of economic and financial activity and management are distinguished. It is well known that the type of management contributes to the economic performance of a farm, its effect being quantifiable at the propagated level. Certainly, in the case of commercial farms that have organized the accountancy according to the law in force, based on the existing information, the incomes, turnover, value added, gross and net profit can be assessed (Dobre et al., 2012).

This paper investigates the economic performance of a commercial farm in North-West Romania, in Satu-Mare County, the research objectives being to identify its determinants and components: productivity, efficiency and competitiveness. The question that this piece of research tries to answer is to what extend the farm's activity is both efficient and competitive? The hypothesis tested is based on previous research (Mechri et al., 2017), arguing that "a farm can be economically inefficient but competitive; reciprocally,

an economically efficient farm is not necessarily competitive". The analysis goes deeper and compare crops between them and proposes solutions for increasing farm's efficiency by replacing one crop to another. In pursuing this, the method of optimizing the structure of production by replacing less efficient crops with more efficient ones is the method of balance of gains and losses (Voicu, Dobre, 2003). The final goal is to enhance performance by changing the structure of production, based on economic efficiency.

Since the bulk part of the scientific papers have studied competitiveness in an international approach, comparing national economies and products on world trade, this paper fill in the gap left in literature on agricultural performance at farm level, especially in Romania. This piece of research analysis the competitiveness from the farm's point of view, investigating its competitiveness at micro level. Moreover, the farm's activity is compared to the other farms that reported the economical results aggregated into average indicators at national level.

Literature review

Hundreds of studies have been published reporting definitions, analysis and measures of agricultural productivity, efficiency and competitiveness, as forms of performance.

Generally, the productivity is defined as a ratio of a volume measure of output to a volume measure of input use (OECD, 2001), regardless of the sector of activity. A special distinction that needs to be made is between agricultural productivity and efficiency. Generally, agricultural productivity is considered to depict the efficiency in its two forms – technical and economic efficiency (Grosskopf, 2002). The former measures how well the inputs are combined. When available inputs are used optimally, the production frontier is reached and a farm which reaches its production frontier means that is has also reached its maximum level of technical efficiency, according to Odhiambo (et al., 2004). The latter refers to marginal values and unit cost, thereby, a farm reaches economic efficiency when the marginal value of the inputs is equal to their respective unit costs, as explained by Kelly (et al., 1996).

Another distinction that needs to be made is between efficiency and competitiveness. While the first measures the economic performance of the farm, the second compares this performance to that of their competitors (Mechri et al., 2017). Moreover, competitiveness and productivity are closely linked, in the sense that higher productivity leads to a greater competitiveness of the farm because more output is produced of the same quantities of resources (Porter, 1990).

The notion of competitiveness has been approached from various perspectives that contribute to enrich the literature. Generally, competitiveness is defined as the ability of a production system to maintain or enhance its market position. Trail and Pitts (1998) argued that a competitive industry is one that possesses the sustained ability to profitably gain and maintain market share in domestic and/or foreign markets. Martin (et al., 1991) described the competitiveness drivers, among them productivity,

technology, products, market structure, inputs, demand conditions, market relations. da Silva César (et al., 2019) also analyzed the competitiveness of soybeans and identified the drivers behind it.

Research on the measurement of agricultural productivity, efficiency and competitiveness is not new. It can be traced back to the classical theory of economic growth. Productivity measurement has its ground theory in the "theory of the firm" in which the inputs can be combined optimally to allocate scarce resources, allowing firms to maximize profits under a cost constraint or to minimize costs under an output constraint. A number of previous researchers have utilized empirical models and statistical methods to measure agricultural productivity. Defined as a ratio of output and input, when measuring productivity, the two determinants must be firstly assessed.

When measuring the output, either gross output or value added estimates can be used to calculate productivity (Mechri et al., 2017). In this piece of research, gross output is used, generally defined as the value of production. Usually, farms produce multiple products, therefore, a common unit for the output must be chosen, such as monetary value, calories and commodity-equivalent. In this paper, the monetary value has been used to express the output.

When measuring the input, three major categories are considered: land, labor and capital. It was found that the labor productivity gap between rich and poor countries is larger in the agricultural sector than in the rest of the economy (Restuccia et al., 2008). The same results have been found by Herrendorf and Schoellman (2015) who sustained that in poor countries, the labor productivity is considerably lower than in the rest of the economy. As regards land productivity, Fuglie (2018) argued that increased cropping intensity has compensated for declining growth in average yield per harvest to keep land productivity growth from falling.

Efficiency is measured from technical and economical points of view. Aignier (et al., 1977) and Meeusen and van den Broeck (1977) grounded the theory of technical efficiency and established the production frontier analysis to estimate its level. Economic efficiency is measured using monetary indicators. One of them is returns over cash costs calculated as the value of the outputs produced by the farm minus the value of the purchased inputs.

Materials and methods

For assessing the levels of productivity and efficiency, a case study of a farm from North-West Romania is considered. It exploits 460 hectares, cultivated with cereals, wheat and corn, and oil crops, sunflower, rape and soybeans.

Since land has a significant place in agriculture, as compared to other branches of economy, the land productivity is estimate using yield as main indicator. Land productivity measures the amount of output generated by a given amount of land. For example, a crop output per land area, commonly referred to as crop yield, is often cited

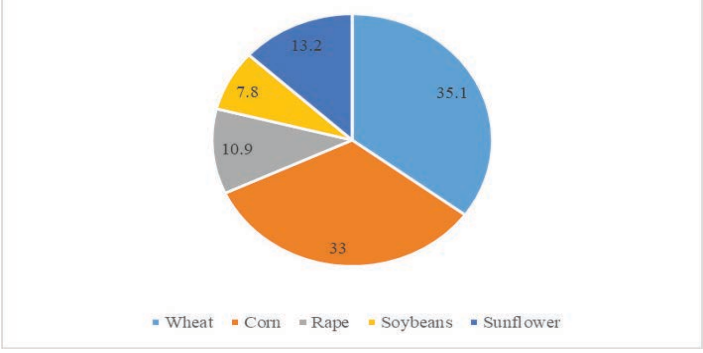
as a land productivity measure. When expressed in monetary terms, land productivity is referred to as returns to land, according to Mechri (et al., 2017).

Table 1. The structure of production and land productivity

Crop	Area (hectares)			Area (%)			Land productivity (kg/ha)		
	2015/ 2016	2016/ 2017	2017/ 2018	2015/ 2016	2016/ 2017	2017/ 2018	2015/ 2016	2016/ 2017	2017/ 2018
Wheat	195.21	160.97	159.58	43.9	35.0	35.1	5578	7053	4950
Corn	120.36	149.59	150.1	27.1	32.5	33.0	7076	8684	8437
Rape	49.25	42.59	49.74	11.1	9.3	10.9	3161	3656	4161
Soybeans	31.83	34.08	35.57	7.2	7.4	7.8	3276	2791	3072
Sun flower	48.19	72.41	60	10.8	15.8	13.2	3894	2151	3495
Total	444.84	459.64	454.99	100	100	100			

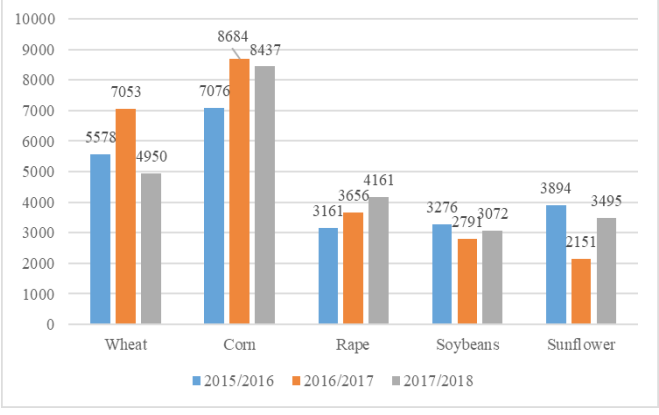
Source: farm's accountancy, authors' calculations

Figure 1. The structure of production, 2017/2018 (%)



Source: farm's accountancy, authors' calculations

Figure 2. Crops' yields, 2015-2018 (kg/ha)



Source: farm's accountancy, authors' calculations

The agricultural area of the farm under analysis is cultivated with wheat (35%), corn (33%), rape (11%), soybeans (7.8%) and sunflower (13.2%), as seen in *Table 1* and *Figure 1*. The land productivity is between 5 and 7 tons of wheat per hectare, 7-8.6 tons of maize per hectare, 3-4 tons of rape per hectare, 2.7-3.2 tons of soybeans per hectare and 2-3.8 tons of sunflower seeds per hectare (*Table 1* and *Figure 2*). The yields vary depending on the amounts of inputs and the variability of weather.

Further, this subsection tries to ascertain to what extent efficiency, as form of productivity, and incomes are linked and how the nature of this relationship can vary depending on the type of crop (*Table 2*). It should be remembered that the level of production, income and expenses have multiple influences that come from factors that change annually what is done at the farm level. In this context, the factor analysis starts from average production, sales prices and production costs. With regard to the production, sales price, production costs and the result of the financial year, different values are recorded, which corresponds to the conditions in which the market acts. Natural elements and the relevance of the management decisions are added.

Total wheat production has varied and the sales price has risen. Prices tend to rise from USD 0.12 to USD 0.15, but their influence in revenue is not significant, because they are negatively increasing. The volume of expenses, expressed in absolute terms, is considerable in the period 2016-2017, but with a downward trend, in the context of large fluctuations in the market.

As regards maize, the maximum total production is 1299,08 tons in 2016/2017, with an equal selling price between 2016-2018 and a low production value in 2015 compared to the 2016-2018. Spending on hectares has fallen in 2016/2017, and then it raised in 2017/2018.

Regarding the rapeseed, the sales price has risen (from USD 0.33 to USD 0.35), which paves the stability of this crop on the market. The cost and production value in the period under review are steadily rising, signalizing the economic importance of this culture. Its role within the economy is widely than agriculture, going behind other industries, such as biodiesel (Turek-Rahoveanu et al., 2018).

With regard to soybean culture, production is oscillating as the shoulder of natural factors. Demand for processed products has aroused the need for soybean cultivation. The value of production, calculated between 2015 and 2018, has a parabolic shape with low slopes, from USD 767.3, in 2015/2016, to USD 934.7 in 2016/2017 and USD 863.5 in 2017/2018.

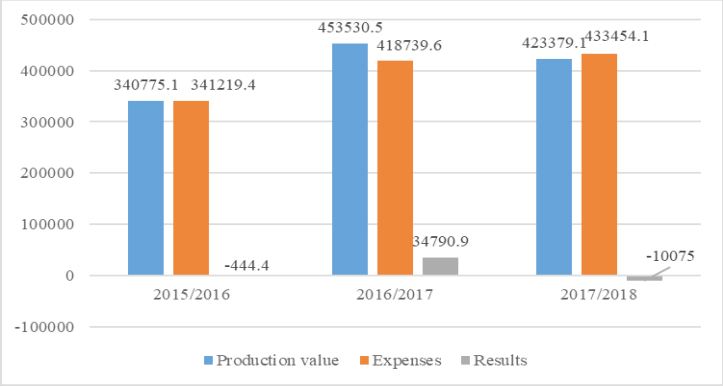
Sunflower, considered a rapacious crop because it consumes the nutrients from soil, has a growing production. The sale price dropped between 2015 and 2018, from USD 0.31 to USD 0.27, which is insignificantly economic, because it still returns positive results.

Table 2. Production values, expenses and results, by crop, 2015-2018

Crop	Item	2015/2016	2016/2017	2017/2018
Wheat	Production (kg)	1088930	1135440	790000
	Price (USD/kg)	0.12	0.14	0.15
	Production value (USD/ha)	653.2	991.2	718.8
	Expenses (USD/ha)	701.4	1073.6	902.1
	Results (USD/ha)	-48.2	-82.4	-183.3
Corn	Production (kg)	851684	1299080	1266400
	Price (USD/kg)	0.09	0.12	0.12
	Production value (USD/ha)	662.9	1016.9	987.9
	Expenses (USD/ha)	849.3	823.2	977.7
	Results (USD/ha)	-186.4	193.7	10.3
Rape	Production (kg)	155700	155747	206970
	Price (USD/kg)	0.33	0.33	0.35
	Production value (USD/ha)	1036.5	1199.0	1461.7
	Expenses (USD/ha)	704.8	773.2	1117.2
	Results (USD/ha)	331.7	425.8	344.5
Soybeans	Production (kg)	104285	95120	109297
	Price (USD/kg)	0.23	0.33	0.28
	Production value (USD/ha)	767.3	934.7	863.5
	Expenses (USD/ha)	755.5	999.9	978.3
	Results (USD/ha)	11.8	-65.2	-114.8
Sunflower	Production (kg)	187656	201363	209670
	Price (USD/kg)	0.31	0.29	0.27
	Production value (USD/ha)	1203.8	814.1	949.3
	Expenses (USD/ha)	899.0	770.3	872.9
	Results (USD/ha)	304.8	43.8	76.4

Source: farm's accountancy, authors' calculations

Figure 3. Production values, expenses and results, all crops, 2015-2018 (USD)

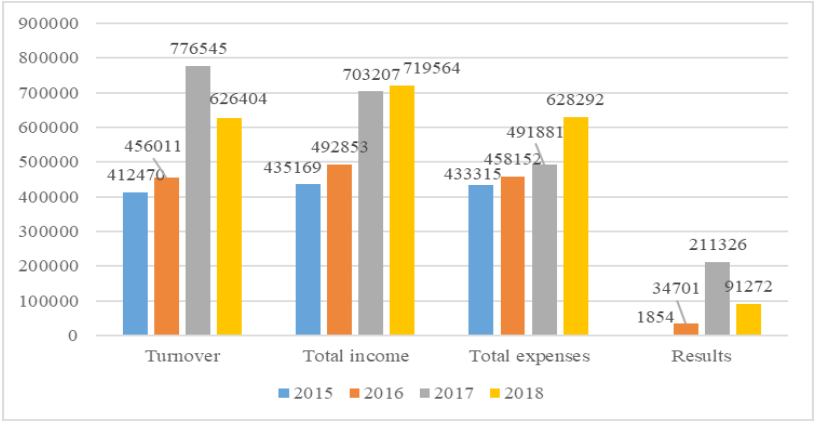


Source: farm's accountancy, authors' calculations

The overall agricultural activity of the farm is efficient in the agricultural year 2016/2017, when the difference between production values and expenses is positive, equal to USD 34,790.9. The crops' cultivation activity is inefficient in the years 2015/2016 and 2017/2018, when the returns are negative, USD -444.4, USD -10,075, respectively (*Figure 3*).

When measuring the level of efficiency, the output taken into account is turnover and profit, and the input is total expenditure (*Figure 4*).

Figure 4. Turnover, income, expenses and results, overall activity, 2015-2018 (USD)



Source: farm's accountancy, authors' calculations

Turnover has the maximum value in 2017, as a result of increased production. Total revenue has increased over the period under analysis. As far as expenses are concerned, they have increased from USD 433,315 in 2015, to USD 628,292 in 2018. The results are positive, reaching a peak of USD 211,326, in 2017. The rate of return has changed in the sense of growth, its values, calculated as ratio between gross profit and total expenditure, are 0.43%, in 2015, and 42.96%, in 2017. Variations in this period relate to the weather variability and market conditions. The profit margin is reduced in 2015 (0.45%) and it has risen to 27.21% in 2017.

The overall activity of the farm is efficient for the whole period 2015-2018, although the efficiency of the agricultural activity, solely, is not efficient every year. One reason could be that, besides the activity of cereals and oil crops cultivation, the farm earns income from the provision of agricultural services and rental of machinery and equipment.

Efficiency and productivity versus competitiveness

In this section, the farm's activity is analyzed from the competitiveness point of view, relatively to the results of other businesses within the agricultural sector, at national and local level (Satu Mare county, in North-West Romania). Its efficiency and productivity is compared with farm's competitors.

Trail and Pitts (1998) consider that there are three approaches when measuring competitiveness. The first one is from the point of view of performance, which looks how well an economic entity has done relative to its competitors. Typical measures are profitability, growth, market share etc. The second one measures the competitive potential, looking at the availability or quantity of inputs, which may produce superior performance such as access to superior technology or cheaper raw materials, leading to lower costs and higher productivity. The third one measures the competitive process, trying to find solutions to convert the competitive potential into competitive performance.

The farm activates in the sector of cereals, oil crops and pulses. The data issued by the Ministry of Public Finance of Romania (2019) show that, at national level, this sector comprises 8,609 economic agents (0.44% of all Romanian agents), 44,445 employees (1.11% of all Romanian employees). The turnover was billion USD 4.5 (1.42% of its national level) and the profit was million USD 680, in 2017. At local level, it comprises 202 economic agents, 964 employees. The turnover was million USD 132 and the profit million USD 13.6, in 2017 (*Table 3*).

The farm registered a turnover of USD 776,545 in 2017. The profit margin registered 27%, above its average level of 10.3% within sector at local level and 15% at national level. The labor productivity is USD 97,068.1 per employee, lower than its national level of USD 101,248.7 per employee and its local level of USD 136,929.5 per employee.

Table 3. Turnover, profit, profit margin, number of employees and labor productivity at national, local and farm level

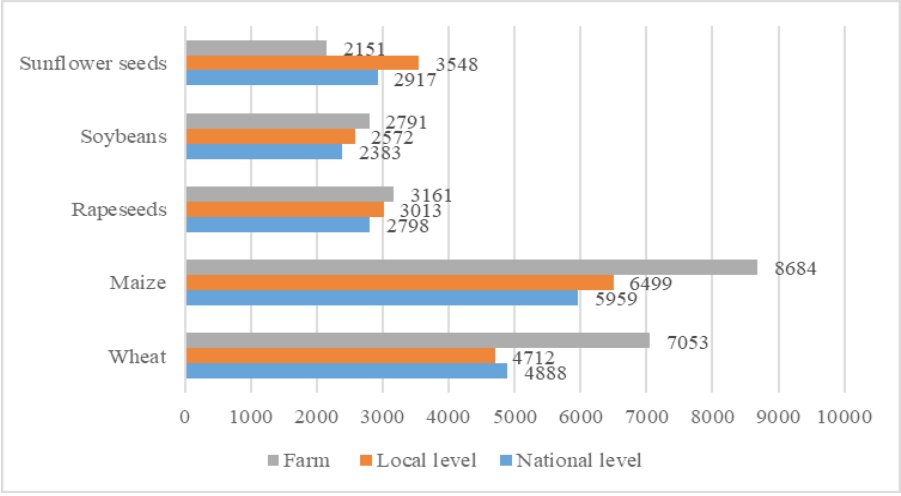
Item	Turnover (USD)	Profit (USD)	Profit margin (%)	No. of employees	Labor productivity (USD/ employee)
National level	4,500,000,000	680,000,000	15.11	44,445	101,248.7
Local level	132,000,000	13,000,000	9.85	964	136,929.5
Farm	776545	211,326	27.21	8	97,068.1

Source: authors' calculation based on data from Ministry of Public Finance of Romania and farm accountancy

Labor productivity is often linked to land and capital. It was noticed that labor productivity in agriculture has increased in the last years because of the growth in crop yields globally (Kelly et al., 1996). This increase is the result of changes in agricultural technologies, such as increased mechanization that requires less labor, using improved quality seeds, which return higher yields, using larger amounts of chemical fertilizers and pesticides. Since these changes occurred mostly in developed countries, the gaps in agricultural productivity across countries and regions can be partially explained by the wider use of machineries, pesticides, chemical fertilizers and improved quality seeds in developed countries, in comparison to developing countries. This is the case of the farm under analysis, which uses lower amounts of chemical fertilizers, pesticides and machineries, as compared to the sector at local and national level.

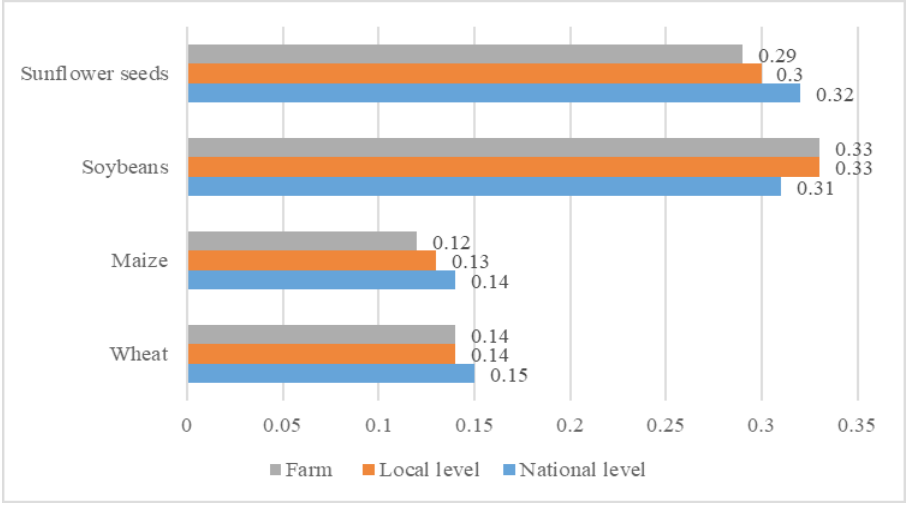
Land productivity, expressed by the indicator crop yields, is presented in *Figure 5*, at farm, local and national levels. The level of yield obtained within the farm for wheat, maize, rapeseeds and soybeans are higher than their levels obtained, on average, at national and local level, meaning that the farm has higher land productivity for these crops compared to its competitors. Sunflower seeds registered a yield below its levels registered, on average, by national and local competitors, signalizing that the land productivity for sunflower seeds is lower than its competitors.

Figure 5. Land productivity, 2017 (kg/ha)



Source: farm's accountancy, National Institute of Statistic of Romania

Figure 6. Prices of wheat, maize, rapeseeds, soybeans and sunflower seeds (USD/kg)



Source: farm's accountancy, National Institute of Statistic of Romania

The enterprise's competitiveness can be measured considering its costs, prices, the quality of products and services (Zahiu, Nastase, 2002). When comparing the prices of products sold by the farm to their average levels at national and local points (*Figure 6*), they are lower or equal to national and local prices for all products: wheat, maize, soybeans and sunflower seeds, except soybeans price which is higher than its national level. We may argue that the farm is competitive, from the price point of view, because its products' prices are lower than the average prices of its competitors.

Enhancing efficiency

In order to increase the efficiency of the farm's activity, it is essential to predict what happens with crops during a statistical year, starting from variations in yields per hectare, product sales prices and production costs. The indicators considered within the analysis are viewed starting from the economic situation in the previous period and from the market conjuncture. The balance takes into account the gains and losses from crops that are replaced and for crops that are introduced into the structure of production. Prices' changes as a result of the supply-demand ratio and the influence of natural conditions on yield lead to a certain degree of risk in their estimation. Different levels of yields for the crop that is introduced into the structure and a change in the sales price of the product obtained from the replaced crop are possible. As a result, the level of the revenue from crop replacement may be higher or lower.

Following, scenarios are used to identify, according to the mentioned indicators, the crops that provide, by price and demand, values for increasing the level of agricultural activity's efficiency. Considering the losses registered in the year 2016/2017, two crops that are inefficient, wheat and soybeans, are considered to be replaced, and three crops, corn, rapeseed and sunflower, which are efficient, will be introduced into the structure of production.

Based on the calculations presented in *Table 4*, regarding revenues and expenses for each crop, expressed in USD per hectare, the highest efficiency is obtained when wheat is replaced by rape, because the difference between gains and losses is USD 508.2 per hectare, compared to scenarios where wheat is replaced by corn, when the difference is USD 276.1 per hectare and in which wheat is replaced by sunflower, in which case the difference is USD 126.2 per hectare.

In what concerns soybean culture, the balance shows that the highest efficiency is obtained when it is replaced by rape, in which case the difference between gains and losses is USD 491 per hectare, compared to scenarios where soy is replaced by corn, when the difference is USD 258.9 per hectare, and when soy is replaced by sunflower, when the difference is USD 109 per hectare.

Therefore, the efficiency of the farm's activity increases as a result of the replacement of part of the areas cultivated with less efficient crops, wheat and soybean, with efficient ones, such as rape, whose efficiency is rising as a results of a high level of price, due to demand from other industries, such as biodiesel.

Table 4. Gains and losses balance when wheat and soybeans are replaced by corn, rape and sunflower (USD/ha)

Crop replaced	Gains	Losses	Crop introduced
wheat	1073.6	991.2	corn
	1016.9	823.2	
	2090.4	1814.4	
gains-losses		*276.1*	
wheat	1073.6	991.2	rape
	1199.0	773.2	
	2272.5	1764.4	
gains-losses		***508.2***	
wheat	1073.6	991.2	sunflower
	814.1	770.3	
	1887.6	1761.5	
gains-losses		*126.2*	
soybeans	999.9	934.7	corn
	1016.9	823.2	
	2016.8	1757.9	
gains-losses		*258.9*	
soybeans	999.9	934.7	rape
	1199.0	773.2	
	2198.9	1707.9	
gains-losses		***491.0***	
soybeans	999.9	934.7	sunflower
	814.1	770.3	
	1814.0	1705.0	
gains-losses		*109.0*	

Source: authors' calculations based on farms' accountancy

Conclusions

This study has examined the relationship between productivity, efficiency and farm's competitiveness. The results show that the relationships between these are not always positive, which validates the hypothesis established ahead that a farm can be economically inefficient but competitive; reciprocally, an economically efficient farm is not necessarily competitive.

It was found that, although the overall activity of the farm is inefficient in some agricultural years, the farm is competitive compared to its competitors, in those regarding prices and yields. The crops' cultivation activities were inefficient in the years 2015/2016 and 2017/2018, when the returns are negative. Among crops, wheat, corn, in 2015/2016, soybeans, in 2016/2017 and 2017/2018, cultivations were inefficient. Meanwhile, the farm is competitive, from the price point of view, because its products'

prices are lower than the average prices of its competitors. The farm is also competitive from the point of view of land productivity. The levels of yields obtained within the farm for wheat, maize, rapeseeds and soybeans are higher than their levels at national and local level. All these confirm the hypothesis that a farm can be economically inefficient but competitive.

Moreover, it was found that sunflower seeds registered a yield below its levels registered, on average, by national and local competitors, signalizing that the land productivity for sunflower seeds is lower. However, sunflower is one of the most efficient crop within the structure of production, what strengthens the hypothesis that an economically efficient crop is not necessarily competitive.

The relevance of the research lies in its capacity to make a clear understanding of the concepts of performance, productivity, efficiency, and competitiveness, their measurement and significance. It also highlights the special attention that should be paid to agriculture when measuring its performance, considering its features referring to unpaid labor supplied by the family members, the lack of accountancy, land as a key capital input, the significant volume of inputs that can originate from the farm itself and the outputs that are often consumed on the farm. All these make the agricultural input and output and, consequently, the productivity and efficiency, difficult to be assessed.

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Conflict of interests

The authors declare no conflict of interest.

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DEPENDENCE OF PROPERTY INCOMES AND SOCIAL CONTRIBUTIONS AS INDICATORS OF AGRO-BUDGETARY POLICY MANAGEMENT

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A B S T R A C T

Agro-budget policy is the basic lever of modern fiscal theory. For this reason, it is scientifically challenging for all market economies, but also for countries in transition. Agro-budget deficits and amounts of public debts faced by many countries requires orientation on this policy. Harmonization of economic policies, inter alia, tax rates, is a necessity but difficulties in its realization are numerous. Numerous authors emphasize its necessity, but also the need to investigate the correlation of categories of government revenues. This article is based on determining the dependence between property incomes and social contributions and the obtained results will confirm or reject hypotheses. In addition, obtained results will show the degree of development of budget policy and thus agro-budget policy and leave space for future authors to find appropriate measures and instruments in future researches for achieving basic macroeconomic goals.

Introduction

A modern fiscal theory based on the disadvantages of the previous theories made the synthesis in order to remove them. That implies a synthesis of public revenues and public expenditures. This would stabilize the economy of one country, while the

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synthesis of fiscal and monetary policy measures, on the other hand, would create the driving force of the economic growth. In the center of modern fiscal policy is agricultural budget policy, with its impact on all agroeconomic sub-systems, should lead to a balance in the economy. (Auerbach, 2000). Full employment and full use of capacities in order to prevent cumulative depression and unemployment should be enabled by an active agro-budget policy (Dimitrijevic, 2018). Modern countries are facing budgetary dysfunctions due to a reduction of fiscal revenues and the growth of public expenditures. Growth of the public expenditures is faster than the growth rate of gross domestic product (Harjula, 2007). Macroeconomic agricultural budget policy is scientifically challenging for all market economies, including countries in transition. Finding an optimal revenue management model and budgetary expenditures implies the creation of appropriate instruments that can be applied in order to achieve macroeconomic stability goals. This implies the harmonization of agricultural budgetary policies to create a unique macroeconomic space. The ultimate goal is to create a free market that will allow freedom of movement of goods, money, labor and capital. The research of measures and instruments of budgetary policy in developing countries must reveal a functional link between budget policy and within agro budget policy and elements of macroeconomic stability (budget deficit, public debt, public spending, aggregate supply and demand, etc.) (Milojević, et al., 2012). Another important reason for budget policy orientation lies in the fact that there are evident conflicts of objectives: to suppress unemployment at the cost of inflation and balance of payments deficit or to reduce inflation with unemployment and declining production (Horne & Wachowicz, 2007; Mićović & Miletić, 2019). Special attention should be given to the property incomes that, due to its share in total revenues, is often marginalized (Nearing, 2019).

Tax control and their management is an important element of fiscal policy (Lind & Nordlund, 2019). Taxes and related tax revenues are important part of the fiscal system. For this reason, there is also a need of harmonization the national tax systems of the states towards common goals (Grover, 2018). The idea of the necessity of harmonizing tax structures was created in the 1980's, so it is necessary to take appropriate measures for their harmonization (Neumann, 1986). This is highlighted in the Eurozone where certain legal frameworks have been adopted and they are binding on the member states in accordance with the legislation of the European Union (Sekera, 2018). These changes include the competition of tax systems to create the conditions of tax-legal convergence. It is basically about the process of unification and integration of the tax systems of the member states. There are sectors that are lagging behind in development. In order for the economic development it is necessary to harmonize public expenditures in accordance with the objectives of macroeconomic policy. In addition to public expenditures, harmonization and public revenues are necessary (Kovačević et al., 2019). In the periods of crisis, the role of budgetary policy is especially emphasized (Vukša et al., 2015; Milojević, & Mihajlović, 2019). Budgetary policy coherence has significant positive effects on the labor market (Popescu, et al., 2018). Developing of information systems has also big importance in providing a base for new workplaces (Neary, 2018). Large corporations are the major generator of workplaces in modern economy (Nica, 2018). Innovation and

education have a positive impact not only on tourism development but also on the overall economic development of a country. (Radovanović & Rendulić, 2017).

Tax harmonization gives significant results that are reflected in the equalization of value added tax (VAT), or their specific variants. However, for more than twenty years there have been no changes in direct taxes harmonization. Reasons should be search in, first of all, reducing the possibility of independent tax policy operations. Numerous authors emphasizes the necessity of harmonizing tax rates, as well as examining the coherence and dependence of certain tax revenues, which would have policy measures having a multiplier effect.

The limitation of the public sector that began to make significant problems and significantly burdens the budgets of the states have big importance (Fatima, 2012). Space should be given to private capital that will be motivated for investment in the crucial sectors of the economy. The best mechanism to motivate private equity holders to invest their capital is to decrease interest rates (Pedauga et al., 2018).

Social transfers are increasingly burdening the budgets of those countries that are confronted with a significant unemployment rate. Even social transfers in the expansion and high employment in order of compensation for increased cost of living lead to the pressure of social budget expenditures.

Numerous authors emphasize the necessity of harmonizing tax rates at all levels, as well as the necessity of examining the dependence between categories of government revenues (Benito et al., 2017). Based on their suggestions, the analysis of the correlation between the categories of government revenues will show the degree of interconnection, and thus the development of measures and instruments of budgetary policy. The accent is on state revenues and their complex structure. Components of government revenues includes taxes, social contributions, revenues from public goods and property income (Baum, et al., 2013). Taxation ranging, from 45.8% in Slovakia to 87.6% in Denmark, has a dominant share in total revenues. In other EU member states they are moving within these borders and have average share of about 60% of total state revenues.

The next category of total share of government revenue is related to the social contributions that are after taxes the most significant source of total revenues. Fluctuations are much higher than in the case of taxes, because in Denmark they are only 0.9%, in Sweden 3.3% and in Iceland 3.5%. In other EU member states they are moving from 4.3% in Ireland to 16.8% in the Czech Republic. The diversity in the participation of social contributions clearly indicates the insufficiently harmonized structure of social contributions and its rates in the European Union. Likewise, the energy paradigm plays a major role in achieving the sustainable development of modern economies (Andrei, J. V., et al., 2017).

Including all categories of government revenues, property incomes has the least share, so fluctuations for this category are the least. In Hungary, for example, property incomes participates with only 0.8% of total revenues compared to Iceland, where is the highest share of this category from 5.8%.

Differences in the share of various types of government revenues, as well as the recommendations of numerous authors had an impact in conceiving the topic of this paper. Using of statistical methods will be tested the dependence of property incomes and social contributions. The set hypotheses will serve to make adequate conclusions. Necessary measures and instruments for improving the real situation can be the subject of future analysis and recommendations for authors dealing with this topic.

Literature review

Williams (2019) was talking about the significance of property incomes and particulary how it was collected. At the same time, he criticized the lack of awareness of the significance of this revenue in total revenues and its effects on GDP. He also pointed out insufficient research on the connection of property incomes and other types of government incomes, but also of expenditures whose analysis could lead to significant conclusions that could be implemented in macroeconomic policy measures in order to achieve significant results.

Sinclaire (2014), apart from the significance of property incomes similar to Williams, points to the different rules of taxation of property that are not compatible, making it more complicated for property income issues. He also noted that significant progress was not made in terms of property incomes in the period 1995-2014. It is clear that there is a need for more significant activities in relation to these revenues and their connection with other sources of revenues and expenditures.

Chao & Eden (2002) emphasized the great importance of property incomes and related taxes. The reason is that these revenues are an important source of local government revenues and source of financing the significant projects. For this reason, they need to be further explored especially their connection to other sources of revenues and expenditures.

Anderson & Shimul (2018) have considered property incomes over the past 45 years and their elasticity and resistance on changes in tax policies. The significance of their research is in the stabilization of the economic system faced with fluctuations. They emphasized the inefficiency of examining the connection with certain forms of expenditures, which would make the measures adopted by the policy more effective and more detailed.

Goudswaard & Caminada (2015) pointed out the concern caused by the economic effects of high labor costs. According to them, the nature of social contributions is of exceptional importance and the changes in the method of payment will lead to a changes in the perception of employers who will regard these contributions as a price rather than as a tax. Their research is limited to OECD member countries. The conclusion is that 2/3 of these contributions are paid by employees and 1/3 by employers. Thus, social state should be reformed. Also, examining the relationship between various categories of government revenues can make the measures of the adopted policy more efficient, which should be the subject of further researches.

Ooghe et al. (2003) evaluated the impact of social contributions on employees' salaries and came to the conclusion that more than 50% of these contributions are borne by employees. Also, it was concluded that if the pension level is to be maintained in the future period, it will be necessary to increase the contribution rates which, according to some authors, is unsustainable in the long period. In addition to other conclusions, it is important to to determine the potential correlation between categories of government revenues. After that must be adopted appropriate tax policy measures that will strengthen macroeconomic stability.

Ramić & Mešanović (2017) point out that taxes of property and social contributions are not harmonized and that there are no legal regulations that would harmonize these two types of taxes as direct tax revenues. This necessitates not only the harmonization of these tax rates, but also the determination of the links between these revenues and the adoption of additional measures of macroeconomic policy in order to achieve its basic objectives.

Ross (2004) gives a description of the administrative arrangements for the collection of social contributions at the international level, with a special focus on pension funds. The aim is to identify critical issues and to establish a necessary of the government approach in resolving these issues as a required condition in the implementation of reforms. It was concluded that the system of collecting social contributions is different in different parts of the world and thus is not harmonized. The need for harmonization in the world is accompanied by the necessity of harmonizing not only social contributions, but also other state revenues and thus property incomes.

Pop (2016) pointed out that social contributions are one of the most important tax revenues and that the reform of the tax system must accept the importance of social contributions to economic development. Romania's integration into the European Union did not have a positive impact on social contributions. The integration itself has increased the number of employees and businesses development, but there is no shifts in social contributions, and the correlation with other tax revenues (among other with property incomes) is not determined, which is a brake of faster economic progress. Social contributions have increased, but their structure, with the aforementioned shortcomings, should reveal the measures that need to be implemented in development policy. Shang et al., (2018) analyzed effect of within-household relative income on happiness, taking into account the role of gender identity.

Research methodology

For the purposes of testing the dependence of property incomes and social contributions we used the software package SPSS within Chi squared test. The reasons for this type of analysis are explained in the introduction and refer to the recommendations of numerous authors in the literature review. Used data is downloaded from Eurostat and will be presented in the next part of the discussion of the results.

In theoretical considerations, the following models are used:

X – Property incomes

Y – Social contributions

Set of values of variable $X : R\ (X) = \{a_1, \ldots, a_r\}$

Set of values of variable $Y : R\ (Y) = \{b_1, \ldots, b_s\}$

Set of values of variable $(X,Y) : R[(X,Y)] = \{(a_i, b_j) : 1 \le i \le r,\ 1 \le j \le s\}$

f_{ij}: the frequency of $(a_i; b_j)$ in the sample

f_i: (marginal) frequency of a_i in the sample

g_j: (marginal) frequency of b_j in the sample

$$fi = \sum_{j=1}^{s} fij \qquad gj = \sum_{i=1}^{r} fij$$

$$p_{ij} = P(X = a_i, Y = b_j)$$

$$p_i = P(X = a_i)$$

$$q_j = P(X = b_j)$$

Hypotheses:

H_0: there is no significant correlation between property incomes and social contributions

H_1: there is significant correlation between property incomes and social contributions

$$H_0 : p_{ij} = p_{i*}q_j \ \textit{for each}\ i \text{ and } j$$

$$H_1 : \textit{there are}\ i, j\ \textit{such as}\ p_{ij} \neq p_{i*}q_j$$

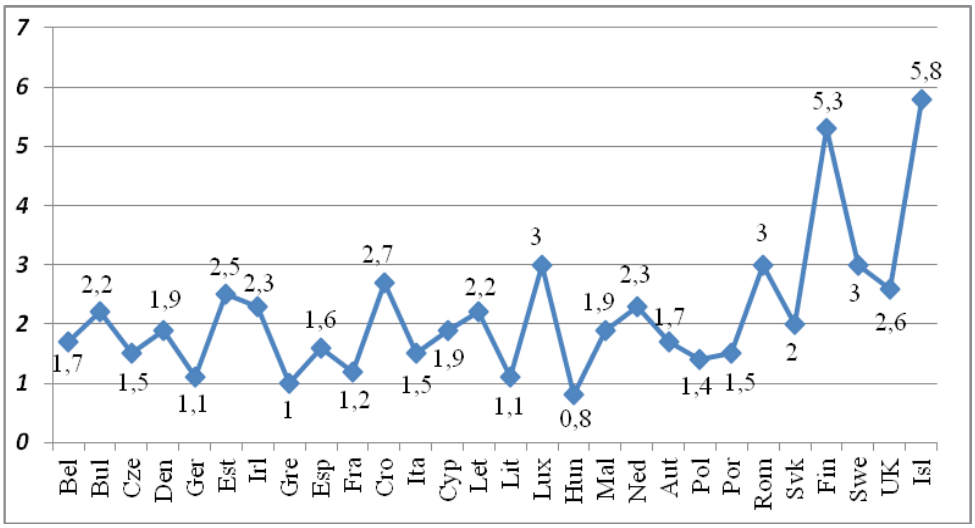
If the H_0 hypothesis is proved then $H \approx \chi^2((r-1) * (s-1))$,

otherwise $H \neq \chi^2((r-1) * (s-1))$.

Results and discussion

Based on the recommendations of numerous authors we made the analysis of the dependence between the property incomes and the social contributions. First of all, Chao & Eden (2002) referred to the significance of this analysis. Different tax rates leads to the differences in absolute amount and in share of property incomes (French, 2011). For this reason is needed a more detailed analysis of government revenues and the adoption of adequate policies in order to harmonize tax rates and the entire tax system. (Sinclaire, 2014). Williams (2019) came to the similar conclusions. Before a more detailed statistical analysis, the next two graphs shows the participation of property incomes and social contributions in total government revenues. Harmonization of property tax will also have a positive effect on investment activity (French, 2019).

Figure 1. Share of property incomes in total government revenues in selected countries



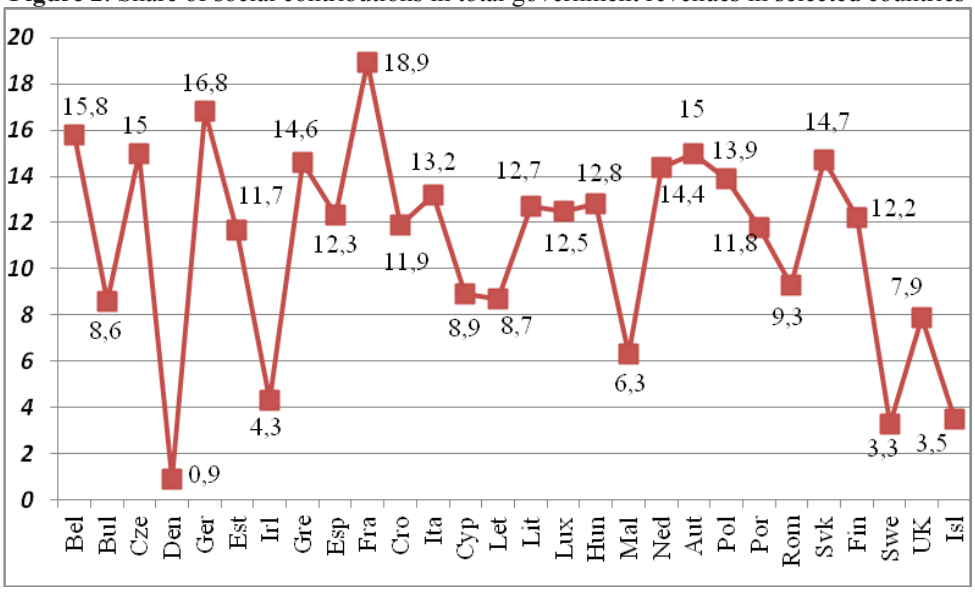
Source: Authors' calculations based on data used from Eurostat

Insight into Figure 1 is obviously different shares of property incomes in total government revenues. The country with the lowest share is Hungary with 0.8% and it is the only state with a share less than 1%. In the group of countries with share within the limits (1-2)% are Belgium (1.7%), Czech Republic (1.5%), Denmark (1.9%), Germany (1.1%), Greece , Spain (1.6%), France (1.2%), Italy (1.5%), Cyprus (1.9%), Lithuania (1.1%), Malta %), Austria (1.7%), Poland (1.4%), Portugal (1.5%). A total of 14 countries, or 50% of the listed in the table, have shares in these bonderies.

Setting the share within limits (2-3)% the list of countries with this share is shorter. Bulgaria (2.2%), Estonia (2.5%), Ireland (2.3%), Croatia (2.7%), Latvia (2.2%), Luxembourg (3.0%) , Netherlands (2.3%), Ruminia (3.0%), Slovakia (2.0%), Sweden (3.0%), United Kingdom (2.6%). A total of 11 countries have share in the mentioned bonderies. More than 3% of the share can be found in Finland (5.3%) and in Iceland (5.8%). It should be mentioned the case of Norway where the share of property incomes is dominant with share of 22.1% in total government revenues.

Social contributions are the subject of researches by numerous authors, which inspired this article. More than 50% of social contributions to workers' salaries are borne by employees. (Ooghe et al., 2013). Beside this conclusion, another one has imposed, that it will be necessary to increase the contribution rates if the level of pensions wants to be maintained. For this reason, they proposed establishing links between the categories of government revenues in order to make more effective the measures adopted by the policies. Legislation that would align social contributions and property incomes does not exist and it is therefore necessary to examine the connection of not only these categories but others in the structure of government revenues (Ramić & Mešanović, 2017). The necessity of harmonizing the system of collecting social contributions as well as the necessary role of the state in solving this problem is crucial as well as determining the dependence among categories of government revenues (Ross, 2004).

Figure 2. Share of social contributions in total government revenues in selected countries



Source: Authors' calculations based on data used from Eurostat

Significant deviations in the share of social contributions in total government revenues is fact that provides data from Figure 2. In order to facilitate transparency and comparison countries are separated in two groups. The first group includes countries with participation of social contributions within the limits (1-10)% of total revenues. This group of countries includes Bulgaria (8.6%), Ireland (4.3%), Cyprus (8.9%), Latvia (8.7%), Malta (6.3%), Romania (9.3% %), Sweden (3.3%), United Kingdom (7.9%), Iceland (3.5%) and in the end it has to be especially mentioned example of Denmark as the only state with share of social contributions below 1%, which puts it at the last place of the listed countries, and the gap between Denmark and Sweden, which is 2nd state with the lowest share of social contributions, is high.

In the next group of countries we can include those with share above 10% of total government revenues. This group is more numerous because that most countries have more than 10% share of social contributions. Using data from Figure 2 those are Finland (12.2%), Norway (10.4%), Slovakia (14.7%), Portugal (11.8%), Poland (13.9%), Austria (15.2%), Netherlands 14.4%), Hungary (12.8%), Luxembourg (12.5%), Lithuania (12.7%), Italy (13.2%), Croatia (11.9%), France (18, 9%), Spain (12.3%), Greece (14.6%), Estonia (11.7%), Germany (16.8%), Czech Republic (15.0%) and Belgium (15.8%). It is obvious that the most developed countries have the largest share of social contributions, but the important question is who is responsible for these contributions, employees or employers (Noronha, et al., 2018)? Rates are different and vary widely, which confirms the fact that different rates apply in the countries (David, 2009). Once again, there is a request to harmonize and determine the dependencies between property incomes and social contributions based on the recommendations of numerous authors, which will prove or disprove it. That will show the degree of development of budget policy and propose measures and instruments in order to achieve basic macroeconomic goals. However, one thing should have be in mind, that the absolute alignment of budgetary policies can not be expected because of the great diversity of the economies (Wang & Ge, 2018). For this reason, the harmonization and synchronization of tax systems with public expenditures and public revenues is very difficult to achieve (Peters, 2002).

Chi-squared test was used to examine the dependence of property incomes and social contributions. Preliminary analyzes of the normal distribution and homogeneity of variances have been done in order to analysis be justified. This analysis in the case of a chi-squared test is not necessary, but it certainly has given positive results because the data follows the normal distribution.

Table 1. Results of Chi-squared test with successive roots removed

Canonical R	*Canonical R-sqr*	*Chi-sqr.*	*df*	*p*	*Lambda Prime*
0.155	0.024	0.673	1	0.411	0.975

Source: Authors' representation based on SPSS

As already emphasized, two hypotheses have been tested.

H_0: there is no significant correlation between property incomes and social contributions

H_1: there is significant correlation between property incomes and social contributions

The obtained results and the coefficient p= 0.411, indicates that there is no significant correlation between property incomes and social contributions, which accepts H_0, and rejects the alternative H_1 hypothesis that presupposes the dependence of these variables.

Table 2. Canoncial analysis summary (Spreads Canonical R: 0,155)

	No. of vars.	*Variance extracted*	*Total redundancy given the other set*
Left set	1	100%	2.418
Right set	1	100%	2.418

Source: Authors' representation based on SPSS

The obtained results and the acceptance of the H_0 hypothesis can be used for further conclusions. The need for harmonization of tax rates has been emphasized by many authors. Measures of implemented policies would be much easier to analyse in that case. The importance of agro-budgetary policy has been emphasized several times. Its necessity refers to developed countries as well as those in transition. The obtained results of property incomes and social contributions can be also interpreted as follows. Testing hypotheses that were set up at the beginning of the research can be concluded that the budget mechanism and the management of macroeconomic agro-budgetary policies are almost rudimentary in the domain of property incomes and that this mechanism should be perfected by a whole range of efficient instruments in countries where the public sector fiscal policy is more pronounced than the public debt in terms of social contributions.

Conclusion

Macroeconomic agro-budgetary policy is extremely scientifically challenging for all developed economies, but also for the economies in transition. In the synchronization and harmonization efforts of the overall budget policy, the state needs, through fiscal reforms, to make the necessary synchronization of measures and instruments of the public sector and its activities in the process of creating a unique macroeconomic space. These efforts are particularly characteristic of the system of creating a competitive market in order to allow freedom of movement of goods, money, labor and capital. The creation of such a market also prefers the countries that are in the transition process, including the Republic of Serbia. There are numerous studies on the property incomes and social contributions presented in the literature review. The conclusions reached by the authors concern the importance of all categories of government revenues and expenditures. The recommendations of many authors are focused on the require to explore the dependence of these categories and the importance of harmonizing tax rates at all levels. The inspiration for this topic has just emerged from these recommendations. The data clearly indicate the different shares of property incomes in total government revenues, which is a confirmation not only of the absence of harmonization of this type of tax, but of others that make up the structure of government revenues. In the discussion section, these differences are explained more detail. The situation is similar the social contributions whose detailed interpretation is given in the same part. To test the dependence, a Chi-squared test was used, and even preliminary analyzes of the normality and homogeneity of the variances were made, although it was not necessary. The obtained results confirmed the H_0 hypothesis and rejected the alternative H_1.

The obtained results can also be used to make conclusions about the budget and agro-budget policy itself. Testing hypotheses that were set up at the beginning of the research can be concluded that the budget mechanism and the management of macroeconomic budgetary and thus agro-budgetary policies are almost rudimentary in the domain of property incomes and that this mechanism should be perfected by a whole range of efficient instruments in countries where the public sector fiscal policy is more pronounced than the public debt in terms of social contributions. Regardless of the absence of the significant results in harmonization of tax rates, it should be said that efforts still exists. It can be discussed about its dynamics, but the fact of its existence is obvious. The European Union, as a concept of a modern state, tends to do so, but the obstacles are numerous and they are mainly based on the legal regulations of the member states and the jurisdiction that is different in the countries. Since the moment of submitting a request for a change in tax policy and tax rates, to the adoption, a lot of time passes with the inevitable political factor and the interests of the ruling classes. However, it should strive to implement measures and policy instruments in transition countries, which will make the accession processes to the European Union significantly faster and open access to various funds in order to achieve faster economic development. All this can be an inspiration to future authors to expand the research and enrich them with new conclusions.

Conflict of interests

The authors declare no conflict of interest.

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INNOVATIVE POTENTIAL OF ENVIRONMENTALLY MOTIVATED FEMALE ENTREPRENEURSHIP FOR SUSTAINABLE DEVELOPMENT IN THE REPUBLIC OF SERBIA

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ABSTRACT

The role of women is extremely important for the economic development of every country. The objective of this paper is to study and understand how important business women are for achieving sustainable economy in Serbia, and how their skills can be utilized in that respect. A descriptive research methodology was used, with the questionnaire as a survey instrument, to demonstrate the momentous role of women entrepreneurs in promoting sustainable practices in economy, social system and ecology. The research shows that women entrepreneurs in Serbia introduce ecology into their business intuitively, but it states that in addition to the ecological component, the economic and social components must be involved in the business operations, in order that the female entrepreneurs contribute to the growth of the national economy. The paper concludes that given the positive impact made by women on the economy and development in Serbia, women entrepreneurship is pivotal in promoting sustainable practices in business socially, economically and environmentally.

Introduction

Project "Innovative Potential for Development – Environmentally Motivated Female Entrepreneurship Network in the Republic of Serbia", conceived by prof. dr. Biljana Chroneos Krasavac and doctoral student Ema Karamata from the University of Belgrade's Faculty of Economics, is one of the projects opted for financing in the 2017 competition

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of the Ministry of Environmental Protection by means intended for improvements in the area of environmental protection. The results of the research conducted under this project represent a basis for the analysis presented in this paper ("Innovative Potential for Development – Environmentally Motivated Female Entrepreneurship Network in the Republic of Serbia", Co-financing Agreement concluded with the Ministry of Environmental Protection under no. 401-00-328/2017-02 as of 13rd October 2017).

The purpose of this paper is to take stock of the significance of introducing environmental component into female entrepreneurship, as well as to identify the effects of such approach on growth, development and sustainability of the Serbian economy. International experience points to the great potential of the environmentally motivated female entrepreneurship from the aspect of smart and sustainable development. To this end the conducted research targeted 80 women entrepreneurs with an ecological component in their businesses. The online survey was conducted by means of a questionnaire sent to 55 women business owners, who, as a result of this project, were included into a network of environmentally motivated female entrepreneurship. The research was conducted in coordination with the consulting agency with an extensive experience in cooperating with the World Bank in the area of sustainable development.

The results of the said research are presented in the section of the work titled Results of research and discussion, where recommendations are put forward regarding the role of female entrepreneurship in sustainable development and possible future directions of female entrepreneurship development in Serbia are presented.

In addition to the section dealing with the results of the research, the paper comprises the section dealing with the analysis of the current state of female entrepreneurship globally and in Serbia, the access to sources of financing, innovation as a factor in advancing female entrepreneurship, as well as ecology as a motivating factor for female entrepreneurship sustainability.

Female entrepreneurship is an interdisciplinary subject closely related to economics, management and sociology, which can be observed from different points of view. It plays one of the key roles in creating profitable jobs, accomplishing gender equality and reducing poverty, which is why it is often seen as a driving force of financial development and sustainable economic growth in many countries (Lerner, Brush, Hisrich, 1997). Women's economic empowerment forms a part of Sustainable Development Goals (SDGs), found in the 2030 Agenda for Sustainable Development (UNIDO, 2018). Nowadays, women play a pivotal part in doing business. According to Sundin and Holmquist (1989), entrepreneurship theories are created by men, for men and applied to men (Marlow, 2002). But women have proved this statement to be inaccurate, and all the nations and recognized organizations have grasped the significance and acknowledged the commitment of women entrepreneurs to the development of a country.

Nowadays women are working in traditional industries, as well as in the industries formerly considered as male industries (Tan, 2008). Evolution of the society has forced

women to tear down the social barriers, so their contribution to the socio-economy has become more significant than before. It is relatively easy to become an entrepreneur and change the course of business, while at the same time entrepreneur can work with people from all over the world (Beverley and Atsese, 2004). The information available to business women and their decision-making capacity have increased, and female entrepreneurship has become a more vital area for building theories and practices. Knowledge of an entrepreneur grows with information gathering, education, increasing work experience, especially through the community activities (Welsh, Memili, Kaciak, and Sadoon, 2014). It has been widely acknowledged that empowerment of women is an effective tool for the development of a country and the world, and that it is very important for improving diet and health, as well as education for the next generation (UN, 2014). The economic empowerment of women has decreased the level of domestic violence and has increased the level of household's survival and the living condition of a family (Kabeer, 2005). Self-employed people are more flexible and independent that those working for others. Literature review shows that women entrepreneurs usually decide to pursue a traditional life style when running a business because their choices are influenced more by socio-cultural factors than technical or financial ones (Tan, 2008). Empowerment of women is crucial for the efficiency which shapes policy debate and consequently economic policies (Duflo, 2011).

Female entrepreneurship is an issueof great importance, therefore it has often been discussed by many academics. An abundance of ideas, concepts and theories related to female entrepreneurship have been developed. Focus of the institutional theory is put on the role of political, economic, and social systems in which entrepreneurs work, along with their selections and behaviour which are built-in (Vossenberg, 2013). Firstly, there is a regulatory system which is focused on the legal and policy entrepreneurs' environment, i.e. property ownership, taxes, access to funds, loans etc. Secondly, there is a normative system which deals with male vs. female roles, family obligations, gendered expectations, religion and various cultural factors. Finally, there is the cognitive system associated with education, training and the use of IT (Vossenberg, 2013)

The features of women entrepreneurs in the three areas of personal characteristics, educational attainment and family background are similar to those of women employees (Lee, 1996). People involved in entrepreneurship are influenced by gender, religion and ethnicity, and those elements reflect in their behaviours (Essers and Benschop, 2009). Socially responsible behaviour should be useful in overcoming social obstacles and supporting women's business accomplishment (Lerner, Brush, Hisrich, 1997).

Having in mind the conditions for doing business in the developing countries as well as in Serbia, women usually start a business out of the need for bare survival, supporting a family, escaping poverty and other reasons. The research conducted so far has shown that a woman entrepreneur in Serbia is the one that starts the business, takes active part in its day-to-day operation and management, owns 50% of the capital and stays in business for a year or two or a bit longer. The statistical data of the Chamber of Commerce and Industry of Serbia show that 99% of women entrepreneurs employ

less than 10 people and mostly operate in the service industries, out of which 76% do business solely at the local market (CCIS, 2017).

Such statistics also show that a successful woman entrepreneur is under 40 and was previously employed; she starts the business in the industry she had worked in and already possesses certain knowledge, experience and contacts; she also takes part in educational programmes (Chroneos Krasavac and Karamata, 2017).

The support to female entrepreneurship available in the Republic of Serbia at the institutional level is insufficient in spite of the existence of a Draft Resolution of the Nacional Assembly of the Republic of Serbia on the Support to Female Entrepreneurship. Such an issue commands systematic and targeted approach.

Currently in Serbia there is no official definition of female entrepreneurship, and no regular gender sensitive entrepreneurship monitoring, thus preventing the implementation i.e. profiling of proper measures for female entrepreneurship improvement and their comparison to those applied in the EU countries and the region. Female entrepreneurship can be monitored through statistical data on employment and entrepreneurship – through analysing small and medium-sized enterprises and entrepreneurship. Available data for the majority of aspects are not gender sensitive and consequently does not provide the insight into gender differences in general entrepreneurial behaviour, and consequently in female entrepreneurship (Chroneos Krasavac and Karamata, 2017).

According to the data provided by the Chamber of Commerce and Industry of Serbia (CCIS, 2017), out of the total active privately-owned enterprises and retails, female entrepreneurs account for only 26% and are specifically concentrated in trade and "other services" (36,4% of women and 28,4% of men in trade, and 44% of women and 41,6% men in "other services"), which points to the fact that women have entered entrepreneurship later than men, that they more often opt for simpler forms of legal entities – shops and sole proprietary businesses (women close down their enterprises and shops more often – 47% of shops started by women were closed down, as compared to 38% of those started and run by men.)

One of the key limiting factors of female entrepreneurship development both globally and in Serbia is the access to financial services. According to the World Bank data (WBG, 2019) some 70% of women-owned SMEs in developing countries are either rejected by financial institutions or are rather unable to secure credits or other kinds of loan proceeds due to unfavourable financial terms and conditions and/or insufficient amount of credit/loan available.

- According to the years-long World Bank experience in this area, the key challenges that female entrepreneurs face globally, especially in developing countries, are the following (WBG, 2019):
- It is estimated that enterprises owned by women represent more than 30% of the total number of formally registered enterprises around the world;

- The World Bank estimates that around USD 300 billion annual credit deficit is caused by registered SMEs in the area of female entrepreneurship due to the inappropriate access to funding;
- The absence of the business contacts network, knowledge deficiency, as well as the non-existence of connection with developed markets are identified as urgent factors limiting the development of female entrepreneurship;
- Unstimulating business environment and regulatory restraints also prove a hindrance in the access to and the availability of sources for female entrepreneurship;
- In most of developing countries, financial institutions still lack developed sustainable strategies for bridging the gap in financing the private sector development, that is women-owned SMEs.

It was exactly because of all the stated reasons that the World Bank announced at the 2017 G20 Hamburg summit the launch of innovative financial product totalling more than one billion dollars so as to help women in developing countries and provide them with the opportunity for easier and quicker access to financing, markets and contact networks necessary for starting up and developing their business activities (G20 Information Centre, 2017). In creating these innovative products, the greatest support was provided by USA as one of the financiers, together with other donor countries.

In order to enable the sustainability of female entrepreneurship in Serbia, it is necessary to support the innovative approach to female entrepreneurship in more productive branches of economy, provide better access to the sources of financing and direct more resources into women starting SMEs instead of their common practice of predominantly founding sole trade businesses, create favourable investment climate for female entrepreneurship, and establish a motivating regulatory framework.

Bearing in mind the fact that women represent a minority in the business world, it is of vital importance that the necessary support to women in all phases of doing business be secured – from starting up to management to growth and development. In the modern business world female entrepreneurship is a priority, with numerous activities aimed at encouraging women to start their own business or strengthen the existing business through different initiatives, including mentorship. Recently, the Government of the Republic of Serbia has been putting greater emphasis on female entrepreneurship and making a point of creating both motivating regulatory framework and favourable business climate for the growth of female entrepreneurship.

It is commonly accepted that the sustainable development is aimed at advancing ecological, sociological and economical aspects of the development of society. The focus in the area of environment protection is on genetic differences, resistance, and ecological productivity, aimed at stabilising the environment. Sociological focus includes cultural differences, cultural sustainability, social justice and participation. Reduction of poverty and improving quality and production of useful goods and services

are objectives of sustainable development economy. Women enterpreneurs take active part in the activities connected with environmental protection through their business activities. More than 50% of female entrepreneurs worldwide operate their business with minimum environmental footprint (Serbian Association of Employers 2013)

One of the basic hypotheses of the modern references in the area of sustainable development is that directing women entrepreneurs towards social, ecological and economical business practice stimulates sustainable development in developing countries. Women entrepreneurs entice green practice and its application in production and services. More than half of women entrepreneurs in developing countries have included green practice in the products or services they offer, which implies promotion of such practice in marketing, advertising, development of human resources, etc. Access to information enables them to better understand the importance of such practice in their business activities. In that respect, certainly the key roles are played by NGOs and other international development organizations which contribute to raising the awareness of green practices and policies among inchoate enterprises and organizations. Women entrepreneurs are promoters of green practices in their fields of production or services. That is exactly the comparative advantage of women in the business game, with great possibilities for growing their businesses in the existing commercial framework (Chroneos Krasavac and Karamata, 2017).

Methodology

The research conducted for the purpose of this paper was aimed at establishing the connection between ecology, female entrepreneurship and sustainable development in an innovative way, where women entrepreneurs, by adopting environmental component into their business, reduce operation costs, preserve and care for the environment and therefore actively participate in smart and sustainable development. With the help of the Chamber of Commerce and Industry of Serbia, the database of female entrepreneurship in Serbia was formed; after its filtration, as well as via communication through the social media and on the internet, the sample of 80 women entrepreneurs running environmentally motivated enterprises was created. Out of 80 sampled women entrepreneurs, 25 opted out of the research following the initial step in communication, which accounts for 31% of the total count. It is also important to point out that women entrepreneurs who opted out of the research demanded that their names and contact details be excluded from the database. All the women entrepreneurs selected prior the start of the research were sent a questionnaire and a covering letter explaining who run the research and to what end. They were also informed that the research was supported by the Ministry of Environmental Protection, which funded the said project selected in the competition.

As a part of this research, an online survey (https://docs.google.com/forms/d/e/1FAIpQLSfthexFnxEvFD_SnXWGHWtB_8jTh0sgL2k6A7XQp9RP_vBfJw/viewform) was conducted, to which 55 women entrepreneurs responded. All of them were entered and networked into the newly-formed database of environmentally motivated female entrepreneurship.

The questionnaire was divided into four sections: the first one collecting personal data and general social and demographic information; the second part dealt with the data on businesses women run, the industry they are involved in and the development of such businesses; while the third part was aimed at collecting data on the actual business activities, development, processes, causes and reasons for success or failure of their enterprises. The fourth section of the questionnaire was concerned with environmental aspect of their business activities, comprising questions that were of vital importance for analysing, reaching conclusions and making recommendations from the aspect of creating business climate and establishing government support to this type of entrepreneurship.

Since the Republic of Serbia is still in transition, still facing a number of economic issues, fighting the battle with fiscal deficit and implementing measures of fiscal consolidation, connection between the economy and ecology was not perceived in the proper way, nor has it been given the corresponding significance in the context of the general development of the country. It was only with the EU demand that Serbia should as soon as possible deal with ecological issues (opening of the Chapter 27) and start the process of harmonizing its legislation with the European framework in this area, that the ecology in Serbia has been given proper significance, systematic approach applied and it has been considered in the context of its impact on smart and sustainable development.

By approaching things from that very aspect, the objective of this research was to draw conclusions on the level of awareness and knowledge of women entrepreneurs of the importance of introducing ecology in business activities, as well as to take stock of their attitudes towards the benefits of such approach to sustainable development.

Results of research and discussion

By analysing the responses received in the first section of the questionnaire, the one concerned with personal data, it can be concluded that the majority of women entrepreneurs is aged 30–45 (25% aged 30, 15% aged 40, and 15% aged 45). As for their formal education, the most of them are tertiary educated (96.2%), while an insignificant number of them holds secondary school degree (3.8%). The polled women entrepreneurs predominantly hold degrees in economics (25%) and/or law (20%).

It is also established that women aged 30–45 who responded to the questionnaire are either married (50%) or single (42.3%), with the insignificant share of the divorced or widowed. As for the number and age of their children, it should be noted that 60% of women entrepreneurs do not have children, while the remaining have children aged 2–15.

The majority of enterprises owned by women is territorially registered in the City of Belgrade and were founded in 2015 (31%) and 2016 (20%), while they operate in the following branches of economy:

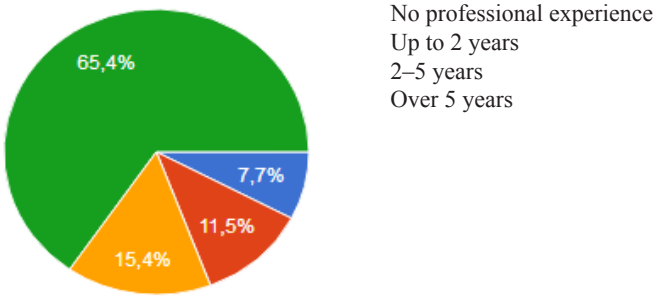
– organic agricultural production, organic food production and processing, production of beauty and organic cosmetic products, leatherware, handicraft and weaving carpets from organic material, fashion and clothes industry (20–30%);

– trade, catering, tourism, research and development and architectural design (40–50%);

– other.

The obtained data referring to the business activities of enterprises indicate that the majority of female entrepreneurs (65.5%) had more than 5 years of professional experience before starting up their own business, 15.4% had 2–5 years of professional experience, 11.5% had up to 2 years of experience, while only 7.7% had no previous professional experience what so ever (Figure 1).

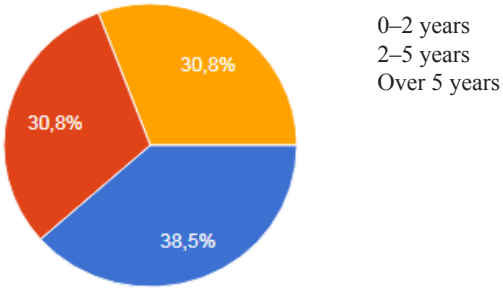
Figure 1. Years of professional experience before starting up a business



Source: Authors reserach

The share of 38.5% of women have worked in the present industry for up to 2 years, 30.8% have had 2–5 years of experience in the present industry, while a third has worked in the present industry for more than 5 years (Figure 2).

Figure 2. Years spent in the present industry



Source: Authors reserach

As regards the number of employees, the preponderance of enterprises employs up to 4 people (88.5%), while 11.5% have 5–9 employees. None of the polled enterprises employs more than 10 employees. The majority of female entrepreneurs spends up to 8 hours at work (46.2%), while 15.4% of women spend over 12 hours at work.

Most enterprises run by women operate in the local market (69.2%), while 30.8% of companies are active both in the local and the international market. None of the surveyed enterprises operates only in the international market.

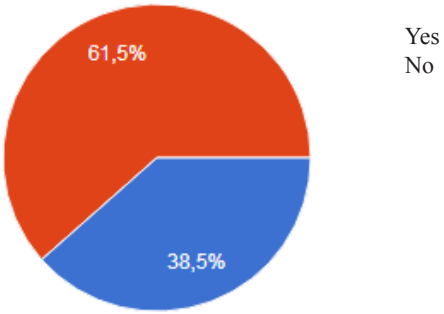
On the issue of motivation for starting up a business, most female entrepreneurs (80.8%) state the aspiration to pursue a good business idea. Half of female entrepreneurs is financially driven, or aspire to increase their income, while environmental protection is the motive for 23.1% of female entrepreneurs. The list of motives includes the lack of employment (15.4%) and bad experience at previous work (11.5%). Ill-treatment of women during their employment history is rarely indicated (3.8%) as the main reason.

Formal education proved to be a significant factor for launching a business; the survey shows that 50% of polled women are formally educated. Out of the 50% of women lacking formal education, 78.6% state that they launched their businesses out of a hobby or affinity for certain activity. For 21.4% of respondents, the reason for starting up a business was to earn a more satisfying income, while only 14.3% moved into own business at the recommendation of friends or family.

As regards the financial means, or the start-up capital, 73.1% of respondents used their own savings, while 23.1% turned to their friends or family for a loan.

The issue of availability of funding for small and medium sized woman-owned enterprises is one of the key challenges faced by female entrepreneurs. This is corroborated by the analysis results which indicate that sources of funding are not available and only 38.5% of women believe that there is a good access to funding (Figure 3).

Figure 3. Access to funding sources

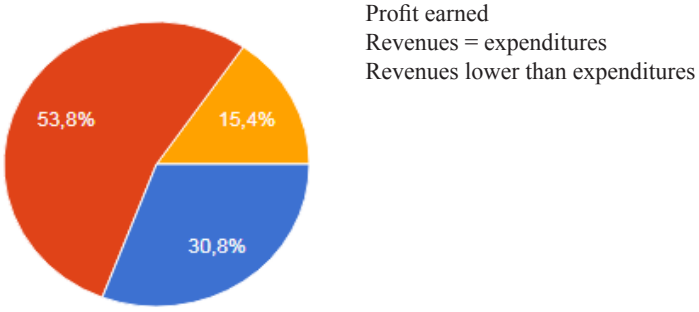


Source: Authors reserach

Women who support the position that funding is available, mostly point to commercial bank loans, development funds and grants as the possible sources of funding.

With respect to the business performance, the majority of surveyed woman-owned businesses are on the verge of profitability (53.8%), while 30.8% generate profit and 15.4% operate in the red (Figure 4)

Figure 4. Business performance

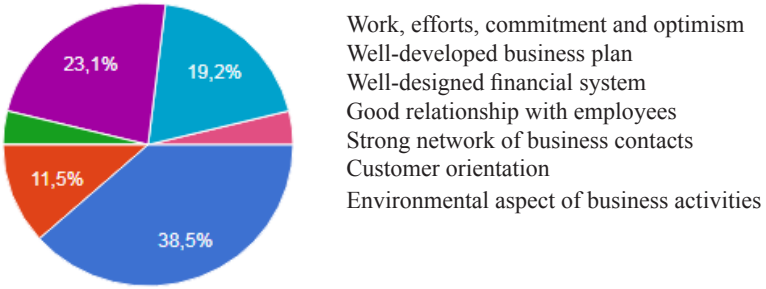


Source: Authors reserach

Female entrepreneurs running successful businesses attribute their success to offering innovative products and services (66.7%). Half of the women associate their good performance with the right timing and the match between market demand and their offer, while 25% of successful entrepreneurs put their success down to constant investments, engagement of skilful staff and improvement of business environment.

Success and survival are mostly attributed to hard work, efforts, commitment and optimism (38.5%), while 23.1% emphasize a strong network of business contacts. The share of 19.2% of women believes that good performance comes from customer orientation, while only 11.5% believe that success is the result of a well-developed business plan (Figure 5). Unfortunately, only 3.8% recognize environmental aspect as the crucial factor for business success.

Figure 5. Reasons for business survival



Source: Authors reserach

Most female entrepreneurs feel positively about vocational training of their employees since 92.3% indicate that their staff receives further education aimed at business improvement, mostly through seminars and courses organized locally and abroad.

The issue of government's incentive policy and its role in stimulating women to launch their own businesses is one of the key issues for sustainable female entrepreneurship. Research has shown that 90% of female entrepreneurs believe that there is room for expanding their operation by penetrating new markets and launching new products, but unfortunately most female business owners do not recognize the government's efforts to encourage and promote female entrepreneurship. As many as 80.8% of respondents believe that the government does not stimulate female enterprises, while only 19.2% hold a positive opinion. Most women with positive outlook do not have an adequate answer when asked about the methods of the government for stimulating female entrepreneurship. Some indicate the role of local government, some point to the Regional Development Agency, while others see networking and training as main government's instruments.

Environmental aspect of female entrepreneurship has been assessed with the aim of determining the extent to which female business owners recognize the importance of environment in their business and their attitude towards environmental protection. As for the reasons for introducing environmental aspect in their operation, female entrepreneurs state the following:

- Reducing the consumption of natural resources;
- Environmental protection;
- Healthy living, healthy family, healthy food;
- Preserving children's health;
- Energy efficiency;
- Corporate social responsibility;
- Wish to bring organic products to the market;
- Using natural materials and abandoning synthetic materials.

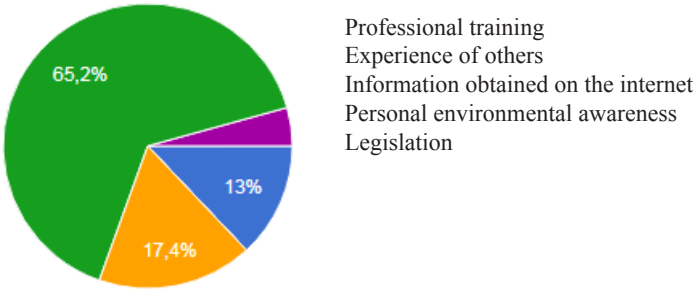
When asked to specify the environmental component of their business activities, female business owners mostly state the following:

- Organic food;
- Organic materials and colouring;
- Recycled packaging;
- Organic cosmetics;
- Energy efficiency of buildings;
- Waste recycling;
- Recycling of cardboard and plastic.

When asked about the impact of introduction of environmental component on the business costs, 52.2% of women answer that it increased the costs, while 47.8% answered negatively. However, on the issue of cost effectiveness of environmental investments, 61% responded positively.

The conclusion that environmental protection is still not sufficiently recognized by female business owners is corroborated by the fact that 56% of women believe that they do not need additional education in order to introduce environmental component in their business operation, while the main reason for introducing this aspect is mostly their personal environmental awareness and information obtained on the internet (82.6 % in total, Figure 6).

Figure 6. Reasons for introducing environmental aspect in business operation



Source: Authors reserach

The aim of the research financed by the Ministry of Environmental Protection was to enable networking and connecting female entrepreneurs running businesses linked to environmental protection. Results of the analysis prove the importance of these issues since 58.3% of respondents believe that networking and exchange of experience is crucial for improvement of their operation, while 33.3% do not feel sufficiently competent to assess the significance of such an action.

Government's engagement, through its development programs and the accompanying support and incentives, is crucial for strengthening the role of female entrepreneurship in the sustainable economic development of Serbia.

With respect to the government's role in the area of environmental protection, female entrepreneurs believe that greatest incentives for environmentally motivated business would include:

- Tax incentives;
- Grants and loans;
- Free professional education;
- Setting up a centre for assistance in introducing environmental component into

business operation;

- Professional assistance in applying and using EU funds;
- Professional assistance in receiving grants and donations.

Conclusion

Research conducted over the last 10 years in the area of sustainable development points to a growing significance of female entrepreneurship for the sustainable economic development and creation of wealth. Female entrepreneurs in developed countries are recognized as social icons motivating women in developing countries. That is why there is a growing number of different initiatives at the local, regional and national level developed by both private and government sector. An array of possibilities and sources of financial support to starting a woman-owned business exist today. Women-led businesses are globally on the rise, which significantly contributes to the household income and national economic growth. There is a direct correlation between female emancipation and the growth of a nation. Therefore, a sustainable development of female resources on the global level, their capacities, skills and other potential are crucial for further development of sustainable world.

In view of all the above-mentioned, it is clear that a female employer must strike a balance between the social, economic and environmental aspects in order to run a successful business that would be of significance for the national economic growth. Given that over the last several years Serbia has increasingly recognized the importance of both environmental protection and female entrepreneurship, a significant economic growth could be achieved by combining these two sectors.

Recommendations, as well as directions for further progress stem from the inability of female entrepreneurs to recognize potential possibilities supporting sustainable development. It is necessary to ensure financial support to female entrepreneurship and remove all economic obstacles to enable female entrepreneurs to reach their full potential. In addition, the key role in promoting environmentally oriented female entrepreneurship should be played by decision makers that must create a stimulating economic and business environment, in cooperation with the academia and experts in the field. Female entrepreneurs must receive appropriate education for introducing environmental aspect in their business operation. They must become aware that environmentally oriented operation largely contributes to lower operating costs and minimizes negative environmental effects of the industry. By holding such environmentally responsible approach, a female entrepreneur becomes a role model for members of her household as well as for a wider community. She is the one who can use her capacities, knowledge, and commitment to introduce change and educate the surrounding. The potential is enormous and should be timely acknowledged.

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Conflict of interests

The authors declare no conflict of interest.

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FOREIGN TRADE AND COMPARATIVE ADVANTAGES OF AGRARIAN SECTOR OF SERBIA AND NEIGHBOURING COUNTRIES

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A B S T R A C T

Foreign trade of commodities of total economy of Serbia and countries in the region is characterized by a huge deficit. Small economies, such as these, are marked with significant trade openness that is result of their high import dependence. Agrarian sector has a high share in foreign trade of Serbia and neighbouring countries. Surplus in foreign trade exists only in Serbian agrarian sector, while the biggest trade deficit is recorded in Bosnia and Herzegovina, and the lowest level of foreign trade coverage (9%) in agrarian sector of Montenegro. Comparative analysis of competitiveness was conducted on the basis of the revealed comparative advantage index. Comparative advantage in the exchange of agro-food products of Serbia with the world is achieved in ten commodity divisions, and the most significant are: cereals; vegetables and fruits; sugar and honey, and in recent years, tobacco and tobacco products. In countries of the region, there is significantly less number of divisions of agro-food products that are competitive on global market.

Introduction

Processes of integration and firm ties of national economies define the flows and characteristics of international trade. In addition to positive effects on economic growth and development, strengthening of competitiveness, rise of living standards and reduction of poverty, a high level of openness towards foreign trade can also cause certain negative effects due to greater vulnerability to external events.

Serbia and neighbouring countries analyzed in the paper (Bosnia and Herzegovina, Montenegro and North Macedonia) are in the process of EU integration, and some of them are on the path to meet conditions for admission to the WTO, which implies the

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implementation of EU regulations and WTO rules, including significant adjustments in foreign trade policy and market liberalization. These adjustments are particularly complex in the agrarian sector, which must be aligned with constantly reforming EU Common Agricultural Policy, as well as the rules of the WTO Agriculture Agreement, since it is the only sector with severe restrictions imposed by WTO.

The process of trade liberalization for the South East European countries begun in 2000's and resulted in signing the New CEFTA Agreement in 2006 and establishment of the free trade area of Western Balkan countries. Main objective of the agreement is to promote trade, and according to a joint declaration, all parties are bound to comply with WTO rules. As an exceptionally sensitive sector, given possible threats it faces, the agrarian sector is still relatively important in national economies of these countries, measured by the share in GDP, employment, or foreign trade. Therefore, it is more and more important to examine the competitiveness of this sector, in conditions of increasing openness towards foreign trade.

The aim of the paper is to compare basic characteristics of foreign trade of commodities, agrarian sector and comparative advantages of certain groups (divisions) of agro-food products in Serbia and selected countries in the region in the period after the economic crisis (2008) until 2017.

The starting hypotheses in the paper are that the agrarian sector of Serbia has a greater importance for levelling the balance of trade and it also has comparative advantages on global market in comparison with the selected countries in the region.

Theoretical framework of the research

The study of the effects of integrative processes in global economy on the characteristics of international trade is widespread in economic theory. Economic structure, level of economic and technical-technological development and achieved level of productivity and competitiveness defines how much a country will be successful in international trade. The trade openness index is used as a basis indicator of involvement in global economic flows. It is calculated as a participation of total foreign trade (imports and exports) in gross domestic product (GDP).

The concept of country's openness is most often analyzed through an examination of impact on economic growth and development. In an analysis of openness it is important to distinguish imports and exports flows, and to determine the degree of dependence on exports (export ratio), and dependence on imports (import ratio). Numerous studies indicate that there is a positive and strong link between exports and economic growth and development (López & Dawson, 2010; Haddad at al., 2011; Tešić, 2013; Boljanović, 2013; Ali et al., 2017; Gözgör & Can, 2017; Sayef, 2017). Some authors, however, question the existence of a positive link between openness and growth, due to the difference in understanding the concept of openness (Baldwin, 2003). It is particularly emphasized that highly open economies (like small and transitional countries) are more exposed to external shocks. The Western Balkan countries are significantly integrated

into the global economic flows, although not highly developed and with exports below potential. The economic crisis in these countries manifested in reducing exports to traditional export markets, and decline in FDI (foreign direct investments).

Tešić (2013) states that key benefit of a country's external orientation is achieving the competitiveness at a global level, but that it is extremely important for small economies to distinguish foreign trade flows on imports and exports. The competitiveness of small transition economies is reduced to the original concept of competitiveness, which looks at the exports performance of a county, where greater export participation means greater competitiveness.

There is no unique definition of competitiveness in economic theory. One of the definitions widely accepted in economic literature includes not only the product market, but also the factors of production, and states: "Competitiveness is an indicator of the ability to supply goods and services in the location and form and at the time they are sought by buyers, at prices that are as good as or better than those of other potential suppliers, while earning at least the opportunity cost of returns on resources employed" (Freebairn, 1987: 79).

Micro competitiveness refers to individual enterprise or groups of enterprises and represents their relative advantage over other (foreign) enterprises. Macro level (macro competitiveness) refers to the competitiveness of national economies as a whole in relation to other economies. National competitiveness arises from the competitiveness of companies included in the economy, and therefore it is result of micro competitiveness, which is one of Michael Porter's starting points (Porter, 1990). "In the past, countries' development was based on comparative advantages, for example low labour cost and natural resources. However, in the modern business environment, international competitiveness stems from advanced factor conditions based on knowledge and "modern" infrastructure, high technology and innovation" (Šegota et al., 2017: 127).

The increase in popularity of macroeconomic concept followed after the World Economic Forum (WEF) experts developed the aggregated Global Competitiveness Index-GCI, based on Porter's research. GCI is published in annual publication "The Global Competitiveness Report" and serves to rank and compare countries according to the achieved level of competitiveness based on various microeconomic and macroeconomic factors. The competitiveness represented by GCI is defined as a set of institutions, policies and factors that determine the degree of productivity of an economy (WEF, 2018).

Since competitiveness is a result of many factors, measuring competitiveness and identifying key indicators is accompanied by significant difficulties. Calculation of competitiveness indicators can be applied for different levels of commodity aggregation: economy, sector, enterprise and individual product (or group of products), as well as for different territories (region, state, and world) (Frohberg and Hartmann, 1997).

In an effort to overcome numerous difficulties related to the measurement of competitiveness and comparative advantages of individual sectors and their comparison

between countries, Balassa (1965) started from actual trade data and based on them defined the concept of the Revealed Comparative Advantage Index (RCA) of a country. This index was first applied by Liesner (1958), but it was popularized by Balassa. In practice, this is a commonly accepted method to analyse trade data known as Balassa Index and it is used to identify advantages and weaknesses of a country in export. If the share of export of a commodity group of a country in global export is higher than the share of that commodity group in the global exports, then that country has comparative advantages in export of this commodity group. This means that the state can produce these products at a lower price than other countries, and that most of its own resources should be devoted to the production of these goods. The Balassa index tries to identify whether a country (sector) has "revealed" comparative advantages rather than to determine the underlying sources of comparative advantage (Božić and Nikolić, 2013-a).

Balassa index, or the RCA definition, has been often changed, and today there is a large number of modified indicators (Fertö and Hubbard, 2002; Bojnec and Fertö, 2007; Božić and Nikolić, 2013-a). Import restrictions, export subsidies and other protectionist policy measures may affect and create a "distortion" of calculated RCA index. This also means that one can make wrong conclusions about the level of open comparative advantage of a sector or a country, based only on the RCA index.

All Western Balkan countries export less of their potential and have a large foreign trade deficit. The structure of their exports is dominated by primary products and raw materials, among which agro-food products play an important role. Research shows that the opportunities of Serbian economy and countries in the region for increasing exports are underutilized. The main reason is insufficient competitiveness (Jefferson Institute, 2003; Jaćimović et al., 2013; Boljanović, 2013; Božić and Nikolić, 2017).

Method of work and data sources

To determine the position and performance of a country on global market in the exchange with other countries, the following indicators were used:

- *Trade Openness Index* (country dependence on foreign trade) measured as the ratio of country's total trade to the gross domestic product (GDP);
- *Export ratio* (country dependence on exports) is the value of a country's export as a percentage of its GDP;
- *Import ratio* (country dependence on imports) is the value of a country's import as a percentage of its GDP;
- *Foreign trade coverage ratio* (TCR) shows how many percent of export is covered by import and represent the ratio between the value of country's exports (X) and imports (M);
- *Revealed Comparative Advantage* (RCA) was used to determine the

comparative advantages of agrarian sector of Serbia and neighbouring countries. In addition to original Balassa Index, modified RCA_2 and RCA_3 indicators were calculated.

The original Balassa index was calculated according to the formula (Balassa, 1965):

$$RCA_1 = \frac{\frac{X_{ij}}{X_{it}}}{\frac{X_{nj}}{X_{nt}}} = \frac{\frac{X_{it}}{X_{nj}}}{\frac{X_{it}}{X_{nt}}} \quad (1)$$

where X represents exports, i is a country, j is a commodity (or an industry), t is a set of commodities (or industries) and n is a set of countries.

This index measures country's export share in a given commodity to global market relative to its share of total exports in global exports of all remaining commodities. If the share of exports of a single commodity of a country in its total exports is higher than the share of exports of that commodity in all (remaining) countries in global exports, (beside that commodity), a comparative advantage is "revealed" ($RCA_1 > 1$).[3] If RCA_1 is less than unity (one), country has a comparative disadvantage in that commodity / industry.

The RCA_1 doesn't include country's imports into account, and therefore it was exposed to significant criticism from numerous authors (Vollrath, 1991; Bojnec, 2001; Fertö and Hubbard, 2002; Utkulu and Seymen, 2004). So, an alternative RCA_2 index (Equation 2) is computed in order to make reference only to "own" country trade performance:

$$RCA_2 = \frac{X_{ij} - M_{ij}}{X_{ij} + M_{ij}} \quad (2)$$

where X represents exports, M is import, i is a country and j a commodity (or industry).

The RCA_2 indicator is a ratio of trade balance of a commodity of a particular country and total foreign trade of that country with the world. The index ratio ranges from -1 to +1. The positive value of RCA_2 for a particular commodity indicates that the country has comparative advantages (surplus) in the trade of this commodity. Regarding RCA_2, there exist ambiguities around zero values.

Additional form of RCA index has been used in order to determine the comparative advantages of individual commodity of agrarian sector of Serbia and neighbouring countries. It is calculated according to the following formula (Balassa, 1965; Utkulu and Seymen, 2004; Božić and Nikolić, 2013-a):

3 When calculating this indicator, it is important to note that the commodity and the country in question are excluded from total exports. This is especially important if this country has a major share on global market and if this product is significantly represented in total export.

$$RCA_3 = \frac{\frac{X_{ij}}{X_{it}}}{\frac{M_{ij}}{M_{it}}} = \frac{\frac{X_{it}}{M_{ij}}}{\frac{X_{it}}{M_{it}}} \quad (3)$$

where *X* represents exports, *M* is import, *i* is a country, *j* is a commodity (section) and *t* is a set of commodities (or industries).

The RCA_3 index of comparative advantage measures the share of export of a commodity (industry) in total country's exports to a particular market relative to the share of imports of that commodity (industry) in total country's imports from that market. The value of RCA_3 greater than 1 indicates that the commodity (industry) has comparative advantages on a given market comparing to other sectors of national economy.

The main source of data for research in this paper was the United Nations Conference on Trade and Development (UNCTAD). The Standard International Trade Classification SITC-rev.4 was used. According to this classification agrarian (agricultural and food products) includes section 0-Food and live animals (divisions: 01-09); Sector 1-Beverages and tobacco (divisions: 11 and 12); Sector 2-Crude materials, inedible, except fuels (divisions: 21, 22 and 29); and Sector 4-Animal and vegetable oils, fats and waxes (divisions: 41, 42 and 43).

Foreign trade of total economy of Serbia and countries in the region

The Western Balkan countries have begun integration processes that require further harmonization and achievement of European standards. The foreign trade policy of these countries in the period after 2000 has been significantly liberalized, and through numerous free trade agreements begun their gradual integration into international trade flows (Božić and Nikolić, 2017). Data on value of total exports and imports, as well as the permanent trade deficit, indicate a low level of competitiveness of Serbian and economies of countries in the region (*Table 1*).

According to the Global Competitiveness Report of the World Economic Forum for 2018, Serbian economy made progress ranking 65th among 140 countries (while in the previous year it was at the 70th position). The economy of BiH (91st place) has the smallest competitive advantages related to countries in the region, while North Macedonia is positioned at 84, and Montenegro is on 71st place (WEF, 2018).

Table 1. Indicators of foreign trade of total economy of Serbia and selected countries in the region in period 2009-2017

Indicator	Ø (2009-2011)	Ø (2012-2014)	2015	2017
Serbia				
Export (mil. US $)	9,973	13,561	13,379	16,959
Import (mil. US $)	17,548	20,028	18,210	22,146
Balance of trade (mil. US $)	-7,575	-6,467	-4,831	-5,187
Export ratio	22.0	29.2	28.5	34.2
Import ratio	38.6	43.1	38.7	44.7
Trade Openness Index	60.6	72.3	67.2	78.9
Foreign trade coverage ratio (%)	56.8	67.7	73.5	76.6
RCA_2	-0.28	-0.19	-0.15	-0.13
Bosnia and Herzegovina				
Export (mil. US $)	4,869	5,580	5,099	6,367
Import (mil. US $)	9,546	10,435	8,994	10,444
Balance of trade (mil. US $)	-4,677	-4,855	-3,895	-4,078
Export ratio	28.3	31.8	27.8	32.6
Import ratio	55.6	59.5	49.0	53.6
Trade Openness Index	83.9	91.3	76.8	86.2
Foreign trade coverage ratio (%)	51.0	53.5	56.7	61.0
RCA_2	-0.32	-0.30	-0.28	-0.24
North Macedonia				
Export (mil. US$)	3,507	4,426	4,490	5,670
Import (mil. US$)	5,848	6,814	6,400	7,719
Balance of trade (mil. US$)	-2,341	-2,388	-1,910	-2,049
Export ratio	37.4	44.8	42.3	51.8
Import ratio	62.4	68.9	60.3	70.5
Trade Openness Index	99.8	113.7	102.6	122.3
Foreign trade coverage ratio (%)	60.0	65.0	70.2	73.5
RCA_2	-0.25	-0.21	-0.18	-0.15
Montenegro				
Export (mil. US$)	484	468	353	421
Import (mil. US$)	2,346	2,351	2,050	2,611
Balance of Trade (mil. US$)	-1,862	-1,883	-1,697	-2,190
Export ratio	11.7	10.9	7.8	8.6
Import ratio	56.6	54.9	45.3	53.5
Trade Openness Index	68.3	65.9	53.1	62.1
Foreign trade coverage ratio (%)	20.6	19.9	17.2	16.1
RCA_2	-0.66	-0.67	-0.71	-0.72

Source: Authors' calculations based on UNCTADStat http://unctadstat.unctad.org/EN/

Trade Openness Index of economies of Serbia and neighbouring countries is large, and exceeds 60% (*Table 1*). *The Export ratio* of all analyzed countries increased. The share of Serbian exports to GDP ranged from 22% to 34%, similar like in Bosnia and Herzegovina. However, this indicator is significantly higher for North Macedonia and in 2017 it was 52%, while it is the lowest in Montenegro where the exports share

accounts for only about 9% of GDP. Although growth of imports is lower than growth of exports in all these countries (except in Montenegro), they all have high *import ratio*, which in Serbia is 45%, and in Bosnia and Herzegovina and Montenegro 53%, while the highest is in North Macedonia (about 70%). These indicators confirm results of previous research stated that high openness of small, transitional economies arises primarily from their high import dependence.

Foreign trade coverage ratio in Serbia increased from about 57% to 77% and it is the highest in the region. In North Macedonia this indicator is about 73%, and in Bosnia and Herzegovina 61%. The lowest foreign trade coverage ratio is present in Montenegro (in 2017 it is 16%), and it is continuously decreasing.

Unsatisfactory competitiveness of economy of Serbia and neighbouring countries is confirmed by calculated index of the revealed comparative advantage (RCA_2). For all countries and in the entire analysed period, RCA_2 has values less than zero, which confirms that there are no revealed comparative advantages of analyzed economies in foreign trade with the world.

Foreign trade and significance of agrarian sector in Serbia and neighbouring countries

Agro-food products are traditionally significant for the overall economic development of the Republic of Serbia, including the contribution to foreign trade, especially levelling the balance of trade (Božić and Nikolić, 2016). Agrarian sector has a special contribution in countries in the region. Involvement in international integration processes and increasing openness of economies of these countries has led to significant changes in the scope, structure, territorial orientation and regime of foreign trade of agricultural and food products (Božić and Nikolić, 2013-b).

The value of exports of agro-food products is the highest in Serbia and in 2017 it exceeds USD 3 billion, i.e. it increased by 40% compared to the base three-year period (2009-2011). The value of Serbian agrarian exports is about five times higher in relation to exports of Bosnia and Herzegovina, and Macedonia, while it is about 57 times higher than the value of agrarian exports of Montenegro (*Table 2*).

The value of Serbian imports of agro-food products in the observed period also increased (by around 50%) and reached almost USD 1.7 billion, which is 9% less than imports of BiH, about two times higher than agrarian imports of Macedonia and approximately three times the value of agrarian imports of Montenegro.

Among the selected Western Balkan countries only Serbia has positive foreign trade balance in the exchange of agrarian products, which is constantly growing. The largest deficit in the foreign trade of agrarian sector is recorded in Bosnia and Herzegovina (about 1.3 billion USD), while in Montenegro it is about 0.5 billion USD, and in Macedonia about 250 million USD.

The foreign trade coverage ratio of agro-food products in the observed period exceeds

100% only in Serbia, which points to the competitiveness of agrarian sector and separates it from other sectors of Serbian economy. Increased opening of the country and trade liberalization caused certain oscillations and a slight decrease in the foreign trade coverage ratio compared to the first three-year period (2009-2011), but it remains high and exceeds 180%. The foreign trade coverage ratio of agrarian sector is the lowest in Montenegro (only 9.1% in 2017), in Bosnia and Herzegovina was around 30%, despite the growth, and in Macedonia about 70%.

Table 2. Comparative overview of foreign trade of agro-food products (AFP) and its participation in total exchange of Serbia and neighbouring countries

Indicator	Ø (2009-2011)	Ø (2012-2014)	2015	2017
Serbia				
AFP export (mil. US$)	2,222	2,860	2,869	3,140
AFP import (mil. US $)	1,122	1,585	1,580	1,686
Balance of trade of AFP (mil. US $)	1,099	1,275	1,289	1,453
Foreign trade coverage ratio of AFP (%)	198.0	180.5	181.6	186.2
AFP exports in total exports (%)	22.3	21.1	21.4	18.5
AFP imports in total imports (%)	6.4	7.9	8.7	7.6
RCA_2	0.33	0.29	0.29	0.30
Bosnia and Herzegovina				
AFP export (mil. US$)	432	488	554	562
AFP import (mil. US $)	1,826	1,907	1,704	1,840
Balance of trade of AFP (mil. US $)	-1,395	-1,419	-1,150	-1,278
Foreign trade coverage ratio of AFP (%)	23.6	25.6	32.5	30.5
AFP exports in total exports (%)	8.9	8.7	10.9	8.8
AFP imports in total imports (%)	19.2	18.3	19.0	17.5
RCA_2	-0.62	-0.59	-0.51	-0.53
North Macedonia				
AFP export (mil. US$)	568	642	538	604
AFP import (mil. US $)	748	861	770	852
Balance of trade of AFP (mil. US $)	-180	-219	-232	-248
Foreign trade coverage ratio of AFP (%)	76.0	74.5	69.8	70.9
AFP exports in total exports (%)	16.2	14.5	12.0	10.7
AFP imports in total imports (%)	12.8	12.6	12.0	11.0
RCA_2	-0.14	-0.15	-0.18	-0.17
Montenegro				
AFP export (mil. US$)	69	97	64	55
AFP import (mil. US $)	567	605	521	600
Balance of trade of AFP (mil. US $)	-499	-508	-457	-545
Foreign trade coverage ratio of AFP (%)	12.1	16.1	12.3	9.1
AFP exports in total exports (%)	14.2	20.8	18.1	13.0
AFP imports in total imports (%)	24.2	25.7	25.4	23.0
RCA_2	-0.78	-0.72	-0.78	-0.83

Source: Authors' calculations based on UNCTADStat

The observed tendencies in foreign trade exchange of total economy, as well as the exchange of agro-food products of Serbia and countries in the region caused significant differences in terms of participation of agrarian sector in total exports. This share is the highest in Serbia (about 20%), which may be the result of use of available resources for development of agriculture and slow development of other sectors. The lowest share of agro-food sector in total exports is constantly present in Bosnia and Herzegovina (around 9%). The share of agrarian sector in total exports over the last decade is decreasing in Macedonia – about 16% in the first three year period reduces to about 11% in 2017; and in Montenegro, where it significantly oscillated and in 2017 it reduced to 13%.

The share of agro-food products in total imports of Serbia and countries in the region is mainly decreasing in the observed period. In 2017 the lowest share of agrarian products in total imports of around 8% existed in Serbia, while in Macedonia it amounted 11%, Bosnia and Herzegovina 18% and in Montenegro 23%.

Positive RCA_2 index values indicates that the revealed comparative advantages in the foreign trade exchange with the world has only agrarian sector of Serbia, i.e. it is more competitive in relation to this sector in selected countries in the region.

Comparative advantages of agrarian sector of Serbia and neighbouring countries

The analysis of the revealed comparative advantages carried out for individual divisions within the agrarian sector in 2009, 2012, 2015 and 2017 for Serbia and neighbouring countries indicates the existence of significant differences in terms of the level of competitiveness.

The RCA_1 index is used in order to determine the position of divisions of agro-food products of Serbia and neighbouring countries on global market. This index shows which commodity divisions contribute most to the export, or to the reduction of foreign trade deficit of individual economies. Value of RCA_1 higher than unity (one) indicates that a commodity division has comparative advantages in the exchange with the world. There are ten such divisions in Serbia, in all years of observation: 00-Live animals; 02-Dairy products and birds' eggs; 04-Cereals and cereal preparations; 05-Vegetables and fruit; 06-Sugars, sugar preparations and honey; 08-Feeding stuff for animals; 09-Miscellaneous edible products and preparations; 11-Beverages; 12-Tobacco and tobacco manufactures and 42-Fixed vegetable fats and oils, crude, rafined or fractionated (*Table 3*).

The highest values of RCA_1 in Serbia in the first year of analysis had division 06-Sugars, sugar preparations and honey, due to preferential export status to the EU market in 2000. In following years the comparative advantage of this division is declining as the result of sugar sector reform in the EU, the abolition of production quotas, and strong competition from the world's major sugar beet producers. High level of comparative advantage had division 04-Cereals and cereal preparations and 05-Vegetables and fruit, which in the following years became more competitive. Cereals, especially corn and wheat, are significant export products of Serbia. However, in recent years, the highest

level of competitiveness, measured by the RCA_1 index, has division 12-Tobacco and tobacco manufactures, followed by 04-Cereals and cereal preparations and 05-Vegetables and fruit.

Divisions with the lowest RCA_1 index values in Serbia during the entire period of analysis, which indicating that they are uncompetitive on global market are 01- Meat and meat preparations and 03-Fish, crustaceans and molluscs. The number of livestock in Serbia is continuously decreasing which has reflected on reduction of meat production and import growth.

In Bosnia and Herzegovina, the comparative advantages in all years of analysis have a smaller number of agrarian divisions compared to Serbia, a total of five, namely: 02-Dairy products and birds' eggs; 05-Vegetables and fruit; 06-Sugars, sugar preparations and honey; 21-Hides, skins and furskins, raw and 42-Fixed vegetable fats and oils (*Table 3*). Nine divisions in BiH in all years have RCA_1 values less than 1, which indicate their non-competitiveness on global market.

Table 3. The revealed comparative advantage indexes-RCA_1 of individual SITC divisions of agrarian sector of Serbia and Bosnia and Herzegovina on global market

	Serbia				Bosnia and Herzegovina			
	2009	**2012**	**2015**	**2017**	**2009**	**2012**	**2015**	**2017**
00-Live animals	4.76	4.35	3.49	2.42	0.26	0.67	0.36	0.41
01- Meat and preparations	0.92	0.76	0.89	0.80	0.89	0.88	2.17	0.69
02- Dairy products & eggs	1.54	1.65	1.38	1.08	2.45	2.57	1.24	1.23
03- Fish and preparations	0.09	0.05	0.06	0.12	0.44	0.28	0.22	0.31
04- Cereals & preparations	5.86	7.79	4.89	3.55	0.93	0.84	1.21	1.57
05- Vegetables & fruit	4.05	4.18	3.97	3.48	1.23	0.90	1.70	1.23
06- Sugars & honey	6.53	5.85	3.22	2.38	1.86	3.07	1.45	1.53
07- Coffee, tea, cocoa	1.73	1.28	0.98	0.88	0.68	0.61	0.62	0.49
08-Feeding stuff for anim.	1.70	2.85	1.79	2.43	0.44	0.59	0.53	0.44
09-Miscell. edible products	2.36	2.39	1.97	1.77	0.81	0.64	0.55	0.40
11-Beverages	3.86	3.56	2.40	2.00	1.07	1.00	0.81	1.00
12-Tobbaco&manufactures	2.24	2.67	7.42	6.64	1.32	0.92	0.66	0.50
21-Hides, skins, furskins	3.06	4.61	3.56	0.57	13.71	18.73	14.04	10.38
22-Oil-seeds & ol. fruits	0.72	1.20	2.00	1.76	0.06	0.07	0.05	0.26
29-Crude an. & veg. mat.	1.04	0.91	0.74	0.62	0.33	0.44	0.54	0.19
41-Animal oils & fats	0.59	0.79	0.61	1.12	0.00	0.01	0.00	0.00
42-Fixed veg. fats & oils	3.22	3.44	2.55	2.19	1.97	1.97	3.35	3.35
43-Anim. or veg. fats & oils, pr.	1.32	1.26	0.81	0.64	0.18	0.22	0.20	0.24

Source: Authors' calculations based on UNCTADStat

Five commodity divisions from North Macedonia have comparative advantages in exports on global market: 04-Cereals and cereal preparations; 05-Vegetables and fruit; 11-Beverages; 12-Tobacco and tobacco manufactures and 21-Hides, skins and furskins, raw (*Table 4*). The highest value of RCA_1 has division 12-Tobacco

and tobacco manufactures, followed by division 05-Vegetables and fruit and 11-Beverages. A total of seven commodity divisions of agro-food products from North Macedonia have RCA_1 index values less than one in all analyzed years, i.e. they are not competitive on global market.

Table 4. The revealed comparative advantage indexes-RCA_1 of individual SITC divisions of agrarian sector of Macedonia and Montenegro on global market

	North Macedonia				Montenegro			
	2009	2012	2015	2017	2009	2012	2015	2017
00-Live animals	1.62	0.77	0.42	0.35	0.03	0.03	0.08	0.13
01- Meat and preparations	1.59	1.30	0.69	0.51	2.38	2.52	3.72	3.58
02- Dairy products & eggs	0.48	0.61	0.65	0.55	0.00	0.09	0.24	0.17
03- Fish and preparations	0.51	0.29	0.05	0.06	0.54	0.01	0.00	0.02
04- Cereals & preparations	1.63	1.53	1.59	1.53	0.92	1.64	1.62	1.75
05- Vegetables & fruit	3.94	3.80	2.82	1.99	1.86	1.78	1.50	1.00
06- Sugars & honey	1.26	0.92	0.80	0.58	0.37	0.01	0.06	0.08
07- Coffee, tea, cocoa	0.76	0.63	0.49	0.47	0.10	1.99	1.91	1.01
08-Feeding stuff for anim.	0.07	0.07	0.08	0.05	0.36	0.04	0.13	0.23
09-Miscell. edible products	1.49	1.11	0.83	0.73	1.21	2.44	0.19	0.26
11-Beverages	5.32	4.26	2.03	1.92	12.65	11.92	11.38	8.70
12-Tobbaco&manufactures	13.77	14.95	9.39	10.96	0.84	2.52	6.91	0.86
21-Hides, skins, furskins	2.12	3.19	1.43	1.86	13.69	25.56	14.18	0.61
22-Oil-seeds & ol. fruits	0.10	0.19	0.10	0.13	0.01	0.00	0.00	0.00
29-Crude an. & veg. mat.	0.73	0.64	0.84	1.05	0.28	0.24	0.21	0.21
41-Animal oils & fats	0.04	0.01	0.01	0.01	1.11	4.13	4.89	3.77
42-Fixed veg. fats & oils	0.65	0.77	1.00	0.23	0.07	1.28	0.13	0.08
43-Anim. or veg. fats & oils, pr.	0.34	0.40	0.39	0.18	0.62	1.75	0.12	0.13

Source: Authors' calculations based on UNCTADStat

Only four divisions of Montenegro's agrarian sector have comparative advantages in exports to global market (RCA_1>1), namely: 01-Meat and meat preparations; 05-Vegetables and fruit; 11-Beverages and 41-Animal oil and fats. The highest index values are characteristic for division 11-Beverages, which confirm its greatest competitiveness on global market. Division 41-Animal oil and fats has comparative advantages only in Montenegro. Nine divisions of agro-food products of Montenegro in all observed years have no competitive advantage on global market (including live animals, dairy products and eggs, fish and products, sugar, and fodder).

All Serbian agro-food divisions have comparative advantages in all years of analysis, measured by RCA_3 index, except 03-Fish, crustaceans and molluscs and 41-Animal oil and fats (*Table 5*). In addition to these two divisions of agro-food products, comparative advantages, in some years of analysis, did not have divisions 07-Coffee, tea, cocoa, spices, and manufactures, 22-Oil-seeds and oleaginous fruits and 29-Crude animal and vegetable materials. Production of these products is limited or completely disabled in domestic conditions, so they are imported.

Comparative advantages in Bosnia and Herzegovina generate only division 21-Hides, skins and furskins, raw and 42-Fixed vegetable fats and oils.

Special significance in national economy of North Macedonia and comparative advantages have divisions: 00-Live animals; 04-Cereals and cereal preparations (except in 2009); 05-Vegetables and fruit; 11-Beverages; 12-Tobacco and tobacco manufactures; and 21-Hides, skins and furskins, raw.

Table 5. The revealed comparative advantage indexes-RCA_3 of individual SITC divisions of agrarian sector of Serbia and Bosnia and Herzegovina on global market

	Serbia				Bosnia and Herzegovina			
	2009	2012	2015	2017	2009	2012	2015	2017
00-Live animals	7.52	3.59	2.42	2.92	0.04	0.12	0.06	0.11
01- Meat and preparations	2.78	1.35	1.29	1.17	0.46	0.43	0.84	0.31
02- Dairy products & eggs	5.78	2.45	2.43	1.77	0.94	0.89	0.59	0.63
03- Fish and preparations	0.14	0.07	0.10	0.28	0.74	0.50	0.42	0.64
04- Cereals & preparations	16.21	16.51	9.68	8.88	0.33	0.27	0.41	0.57
05- Vegetables & fruit	3.59	3.12	3.34	3.47	0.89	0.74	1.34	0.95
06- Sugars & honey	9.06	6.80	4.46	3.79	0.76	1.28	0.64	0.54
07- Coffee, tea, cocoa	1.13	0.61	0.52	0.59	0.26	0.24	0.25	0.21
08-Feeding stuff for anim.	3.06	3.67	2.21	2.65	0.15	0.19	0.22	0.20
09-Miscell. edible products	1.99	1.31	1.12	1.46	0.19	0.16	0.16	0.13
11-Beverages	5.93	4.36	2.86	2.82	0.22	0.23	0.21	0.31
12-Tobbaco&manufactures	2.00	1.21	2.54	1.90	0.30	0.27	0.30	0.34
21-Hides, skins, furskins	3.61	1.85	1.89	5.25	3.72	2.12	2.71	10.71
22-Oil-seeds & ol. fruits	0.93	1.27	1.87	1.90	0.05	0.06	0.04	0.22
29-Crude an. & veg. mat.	1.42	1.15	0.82	0.92	0.30	0.53	0.60	0.26
41-Animal oils & fats	0.80	0.76	0.59	0.89	0.00	0.01	0.00	0.00
42-Fixed veg. fats & oils	6.32	7.70	4.71	4.74	1.25	1.08	1.68	1.49
43-Anim. or veg. fats & oils, pr.	1.91	3.37	1.64	2.60	0.16	0.18	0.16	0.10

Source: Authors' calculations based on UNCTADStat

Comparative advantages in relation to other sectors in national economy (RCA_3) in all analyzed years in Montenegro are recorded only for division 11-Beverages (Table 6).

Table 6. The revealed comparative advantage indexes-RCA_3 of individual SITC sections of agrarian sector of North Macedonia and Montenegro on global market

	North Macedonia				Montenegro			
	2009	2012	2015	2017	2009	2012	2015	2017
00-Live animals	6.79	1.76	1.34	1.01	0.00	0.00	0.01	0.02
01- Meat and preparations	0.48	0.40	0.27	0.22	0.43	0.41	0.63	0.67
02- Dairy products & eggs	0.29	0.33	0.40	0.37	0.00	0.02	0.04	0.04
03- Fish and preparations	0.77	0.54	0.11	0.16	0.70	0.01	0.00	0.03
04- Cereals & preparations	0.99	0.82	1.07	1.13	0.30	0.50	0.51	0.65
05- Vegetables & fruit	3.81	3.65	2.99	2.25	1.10	0.99	0.72	0.51

	North Macedonia				Montenegro			
	2009	2012	2015	2017	2009	2012	2015	2017
06- Sugars & honey	0.41	0.28	0.32	0.25	0.19	0.01	0.03	0.05
07- Coffee, tea, cocoa	0.34	0.28	0.27	0.27	0.03	0.54	0.70	0.41
08-Feeding stuff for anim.	0.06	0.07	0.06	0.06	0.22	0.01	0.06	0.14
09-Miscell. edible products	0.48	0.39	0.39	0.36	0.36	0.63	0.05	0.08
11-Beverages	4.82	3.99	2.16	2.14	2.71	2.17	2.26	1.90
12-Tobbaco&manufactures	11.37	6.46	4.91	5.12	0.20	0.96	2.70	0.33
21-Hides, skins, furskins	3.12	4.41	4.17	2.69	329.41	15.59	nv	487.79
22-Oil-seeds & ol. fruits	0.20	0.49	0.20	0.33	0.15	0.00	0.02	0.00
29-Crude an. & veg. mat.	0.56	0.68	0.85	1.35	0.29	0.25	0.17	0.20
41-Animal oils & fats	0.04	0.01	0.01	0.01	0.72	4.07	4.13	3.36
42-Fixed veg. fats & oils	0.37	0.33	0.53	0.18	0.04	0.74	0.08	0.06
43-Anim. or veg. fats & oils, pr.	0.20	0.39	0.38	0.49	1.37	6.52	0.59	1.29

Source: Authors' calculations based on UNCTADStat

Notes: nv-import of this product is not recorded in a given year

In some years this also applies to divisions: 05-Vegetables and fruit; 12-Tobacco and manufactures; 41-Animal oil and fats and 43-Animal or vegetable fats and oil, processed. Division 21 has very high values of RCA_3 index, which is result of extremely high export, much higher than import (for example, exports were 54 times higher than imports in 2015), and small import values.

Conclusions

The foreign trade of Serbia and selected countries in the region (Bosnia and Herzegovina, Montenegro and North Macedonia) is characterized by a large deficit, which indicates a relatively low level of competitiveness. The growing openness of economies of these countries is more the result of rising import dependence than the tendency of exports. *Import ratio* reaches around 45% in Serbia and in Bosnia and Herzegovina and in Montenegro about 53%, while it is the highest in Macedonia (70%). The foreign trade coverage ratio in Serbia has increased in the observed period and is highest comparing to other selected countries. Unsatisfactory competitiveness of economies of Serbia and neighbouring countries is confirmed by index of revealed comparative advantage (RCA_2).

Agro-food products are traditionally significant for the overall economic development of the Republic of Serbia. The positive foreign trade balance in the exchange of agrarian products among Western Balkan countries has only Serbia, where foreign trade coverage ratio of agro-food products exceeds 100%, which points to the competitiveness of agrarian sector and separates it from other sectors of the economy. The share of agrarian sector in total exports is the highest in Serbia, around 20%, which can be justified in available resources for the development of agriculture and slow development of other activities. Those findings confirm the hypothesis that the agrarian sector of Serbia is of greater importance for levelling the trade balance in comparison with the selected countries in the region.

The revealed comparative advantages on global market in the export of agrarian products of Serbia, or the RCA_1 index values greater than one in all years of the analysis, have ten divisions whose contribution to exports is also the highest. The highest comparative advantages in the first analyzed year had division 06-Sugars, sugar preparations and honey, while in the following years more competitive commodities are cereals; vegetables and fruits; and in the last years division 12-Tobacco and tobacco manufactures.

Divisions that have the lowest values of RCA_1 index in Serbia, indicating that they are uncompetitive on global market are: 01-Meat and meat preparations and 03-Fish, crustaceans and molluscs.

The countries included in the analysis are characterized by a lower level of competitiveness of agrarian sector and smaller number of products that have comparative advantages in the exchange on global market, which confirms the second starting hypothesis. In BiH there are five divisions (among which the most important are 02-Dairy products and birds' eggs and 06-Sugars, sugar preparations and honey). In Macedonia, also five commodity divisions have comparative advantages in the exchange on global market (and the most significant are: 04-Cereals and cereal preparations; 05-Vegetables and fruit; 11-Beverages; 12-Tobacco and tobacco manufactures). Montenegro achieves the revealed comparative advantages in the exchange of four divisions: 01-Meat and meat preparations; 05-Vegetables and fruit; 11-Beverages and 41-Animal oil and fats. Among all the countries included in the analysis, only Montenegro achieves competitive advantages in the exchange of animal oils and fats, while all observed countries have comparative advantages on global market in trade of vegetables and fruits. The RCA_3 index confirm that almost all divisions of agro-food products in Serbia have greater comparative advantages compared to other sectors of the national economy, while in selected countries in the region fewer divisions show such competitive advantages.

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Conflict of interests

The authors declare no conflict of interest.

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THE EFFECT OF AGRICULTURAL FUTURES PRICE CHANGES ON THE AGRICULTURAL PRODUCTION IN AP VOJVODINA

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ABSTRACT

This paper investigates whether global agricultural futures of corn, wheat, oats, soybean and canola have any influence on the annual agricultural production of these plants in AP Vojvodina. For the estimation purposes, the study applies robust Bayesian quantile regression. Besides, two scenarios are considered – 1) current futures prices, and 2) futures prices from the previous year. Estimated results suggest that current futures prices do not affect current agricultural production of corn, wheat, oats and soybean in AP Vojvodina, because the estimated quantile parameters have negative sign or they are very small. However, when futures prices from the previous year are analysed, the majority of estimated QR parameters bear positive sign, which means that Serbian farmers take into account in greater or lesser extent the global agricultural prices when they plan their annual agricultural plantation. According to the findings, canola futures have the greatest effect on the rising Serbian canola production.

Introduction

It is well known among market practitioners and scholars that agricultural commodity prices have been characterized by a huge rise in volatility in recent two decades. According to Gilbert (2010) and Li and Lu (2012), a number of reasons has been listed as possible culprits: the rapid economic growth of China and India, the biofuel programs of the US and the European Union, speculative trading activities, changing climate conditions, significant variation in harvests and inventory levels of agricultural

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products, and so forth. Due to these uncertainties, global agricultural producers have difficulties to plan their annual production levels of a particular crop as well as their overall agricultural investments. In order to protect themselves from the global agricultural price changes, futures stand as a suitable mean for the risk reduction, which helps global farmers to efficiently hedge against risk of agricultural price changes (see Birovljev et al., 2012; Kuzman et al., 2018).

Gulan (2014) contended that production of agricultural sector in Serbia vis-à-vis Serbian GDP is relatively significant, and it ranged between 11.8%-15.5% in the period 2002-2012. From that amount, participation of plant production was 67.8%, while livestock amounted 30.0% in 2013. In addition, Đurić et al. (2017) asserted that agricultural and food sector has an important role in the economic development of Republic of Serbia, whereas it significantly participates in the structure of domestic exports. Therefore, one of the basic interests of Serbian farmers is to know at what price they can sell their agricultural products after they finish harvest. This factor also plays a major role in the process of decisioning how many hectares of which agricultural crop will be planted.

Having in mind aforementioned, this paper investigates whether and in which extent global agricultural futures prices affect annual agricultural production in Serbia. The following agricultural commodities are selected – corn, wheat, soybean, oats and canola. Futures prices are considered rather than spot prices, because futures incorporate all available information known up to present time, but also cover predictions and expectations about incoming events (see Natanelov et al., 2011). In the process of decision making how many hectares will be covered by particular crop, farmers usually take into account the agricultural prices from the previous year. Therefore, the primary research of this paper tries to stipulate how futures prices from the previous year affect the current agricultural production in Serbia. In addition, a less likely scenario is also considered, which involves estimation of how current futures prices impact current agricultural production. These results serve for the comparison purposes. We hypothesize that agricultural futures prices have an effect on the agricultural production in Serbia, but the extent of this effect on the production heavily differentiates between the selected commodities.

In addition, we want to see whether the connection between global futures prices and Serbian agricultural production depends on different level of Serbian annual agricultural production. In other words, the goal is to see whether high futures prices instigate increased agricultural production, and vice-versa. This type of estimation is feasible if the influence of futures prices, as independent variable, is observed on different quantiles of agricultural production, as independent variable. Therefore, in order to conduct this type of research, the paper utilizes robust Bayesian quantile regression (QR), which uses MCMC (Markov Chain Monte Carlo) algorithm in the estimation process. Bayesian QR is useful because it produces exact inference about the quantile parameters, i.e. all Bayesian quantile parameters are statistically significant. More precisely, Bayesian QR methodology in comparison with the traditional QR of Koenker and Bassett (1978) decreases the length of the credible intervals, and increases accurateness of the quantile estimates.

This paper adds to the literature by investigating thoroughly the impact of agricultural futures prices on the agricultural production in Serbia, by using elaborate Bayesian QR methodology. To the best of our knowledge, this paper is the first one in the extant literature, which did this type of research. The significance of the paper could be in answering whether farmers in Serbia consider financial derivatives when they plan agricultural plantation. Also, this paper could rise an awareness of practical usefulness of agricultural futures in the process of price changes risk reduction, which poses a major problem in Serbia for many years.

Besides introduction, the rest of the paper is structured as follows. Second section gives a brief literature review. Third section explains used methodology. Forth section presents dataset and their statistical properties. Fifth section is reserved for the results, while the last section concludes.

Brief literature review

Generally speaking, futures have become one of the most important financial instruments in last few decades for information processing, price discovery, hedging and various diversification strategies. This subject of research is important for farmers in Serbia since agricultural market in Serbia is disorganized, according to Ignjatijević et al. (2018). They asserted that agricultural market in Serbia has the characteristics of a perfectly competitive market regarding supply, and the characteristics of the oligopoly regarding demand. Also, they argued that there is no cooperation between the producers and processors. Besides, Haile et al. (2017) contended that weather extremes, such as shocks in both temperature and precipitation during crop growing months have serious consequences on the production and supply of agricultural commodities, which strongly influences their prices. Marković et al. (2013) added that Government should determine minimum price of agricultural products in advance in order producers know the level of profit they can count with. However, if this type of mechanism is unavailable, some other form of price change protection would be of great help for farmers in Serbia.

Accordingly, this section concisely presents the studies that deals with the topic of agricultural futures regarding different perspectives. For instance, Dimpfl et al. (2017) consider price discovery of spot and futures markets for six major seasonal and non-seasonal agricultural commodities. They drew a conclusion that efficient price of agricultural commodities is determined on the spot market in the long-run. Bohl et al. (2018) empirically researched whether speculative activities in Chinese agricultural futures markets destabilizes futures returns. They found evidence of a positive influence of the speculation ratio on conditional volatility. Bohl et al. (2019) investigated how speculation affects the price discovery function of four agricultural commodity futures markets. They revealed that speculation, both total and excessive, improves futures markets' price discovery function. They asserted that speculation reduces the level of noise incorporated in the futures prices and it increases the speed at which the futures prices reflect new information about changes in market fundamentals.

Beckmann and Czudaj (2014) investigated the volatility spillover between various agricultural futures markets – corn, cotton, and wheat. They used GARCH-in-mean VAR models and provided evidence that short-run volatility transmission process exists in the agricultural futures markets. Jia et al (2016) studied the dynamic lead–lag relationship between the Chinese and American agricultural futures markets in both returns and volatility. They considered soybean, corn and wheat. They disclosed that the volatility transmission from the US to China wheat futures market takes longer time than soybean. They concluded that reason probably lies in a fact that China's soybean futures market is more closely linked to the international agricultural futures market than wheat. Ma et al. (in press) explored the effect of co-jumps within the agricultural futures market, and co-jumps between the agricultural futures market and the stock market, on stock volatility forecasting. They found that large jumps may lead to more substantial fluctuations and are more powerful than small jumps. They contended that a model, which includes large and small co-jumps between the agricultural futures market and the stock market can achieve a higher forecasting accuracy.

Bayesian quantile regression methodology

Traditional quantile regression technique was developed by Koenker and Bassett (1978). This particular methodology extends the mean regression model to conditional quantiles of the response variable. Utilizing this approach, researchers can gain more detailed view of the relationship between response variable and covariates, because it allows researchers to estimate how a set of covariates influence the different parts of the distribution of the dependent variable. This characteristic of QR methodology have been found appealing by many researchers from various theoretical disciplines (see e.g. Maestri, 2013; and Živkov et al., 2014). Also, Benoit and van den Poel (2012) contended that parameter estimates of QR are not biased by a location-scale shift of the conditional distribution of dependent variable.

The goal of this paper is to determine how futures price changes affect the changes in the agricultural production in AP Vojvodina. As have been said previously, the interdependence is observed in two ways: 1) when the current futures price changes affect the current production (equation 1), and 2) when the previous year futures price changes impact the current production (equation 2).

$$APC_{i.t} = FPC_{i.t} + \varepsilon_{i.t} \tag{1}$$

$$APC_{i.t} = FPC_{i.t-1} + \bar{\varepsilon}_{i.t} \tag{2}$$

where $APC_{i.t}$ denotes agricultural production changes of a particular crop (i) at the time (t), $FPC_{i.t}$ and $FPC_{i.t-1}$ stand for futures price changes of particular crop (i) at the times (t) and (t-1), while ε and $\bar{\varepsilon}$ are white noise error terms in both equations.

Benoit and van den Poel (2017) explained that if $\mathrm{Med}(\varepsilon|x) = 0$ is assumed, then $\mu(x_i)$ is a conditional median function, while a linear conditional median model is given by $\mathrm{Med}(y_i|x_i) = x_i'\beta$. Accordingly, the regression parameter can be found by solving equation (3):

$$\mathrm{argmin} \sum_{i=1}^{n} |y_i - x_i'\beta| ; \quad \beta \in \Re \tag{3}$$

Quantile regression extends the median case to all other quantiles, and these quantile parameters can be estimated by solving the equation (4):

$$\hat{\beta}(\tau) = \mathrm{argmin} \sum_{i=1}^{n} \rho_\tau(y_i - x_i'\beta); \quad \beta \in \Re \tag{4}$$

where $\tau \in (0, 1)$ is any quantile of interest, while $\rho_\tau(z) = z(\tau - I(z < 0))$ and $I(\cdot)$ stands for the indicator function. The quantile $\hat{\beta}(\tau)$ is called the τ^{th} regression quantile, while in the case where $\tau = 0.5$, it corresponds to median regression.

According to Benoit and van den Poel (2017), first step in the implementation of the Bayesian quantile regression[4] involves the formation of a likelihood comprised of independent asymmetric Laplace densities with $\mu = x_i'\beta$, specifying the quantile of interest (t). The model parameters are then estimated by conventional Bayesian procedure, which uses MCMC algorithm, producing the exact inference about $\hat{\beta}(\tau)$ Sriram et al. (2012) asserted that key advantage of the Bayesian quantile regression comparing to the conventional QR model is the fact that 95% Bayesian credible interval contains the true parameter value 95% of the time. These authors explained that with increasing sample size, coverage improves, while the length of the credible intervals decreases.

Dataset and statistical properties of the selected time-series

This paper uses annual data of five cereals – corn, wheat, soybean, oats and canola. In particular, we observe futures prices of these agricultural commodities and the annual production in tons in Serbia, observing only the production in the area of Autonomous province of Vojvodina. Our data sample covers the period from 2005-2018, and the reason why longer time-span is not observed lies in the fact that the futures prices for canola exist only from 2005. Futures prices are collected from Chicago mercantile exchange (CME), whereas the data for agricultural production is taken from the official website of Statistical office of the Republic of Serbia. This analysis is limited to these five cereals, because only these agricultural commodities are traded in CME, and they are also produced in Serbia. Due to the fact that our data-sample comprises relatively low number of observations, this paper uses Bayesian quantile regression,

4 Bayesian quantile parameters were calculated via 'bayesQR' package in 'R' software.

rather than traditional QR. This is because Bayesian QR is robust methodology, capable of producing efficient quantile estimates even in low data environment, which traditional QR cannot do. This paper does not embed the raw empirical data in Equation (1) and (2), but all data are transformed in rates of return, according to the expression:

$$r_{i.t} = \ln(P_{i.t}/P_{i.t-1}) \times 100.$$

Table 1 provides descriptive statistics of the agricultural production changes and agricultural futures price changes, while Figures 1 and 2 present graphically their dynamics. Figures 1 and 2 clearly show erratic dynamics of futures prices and annual production in the observed period, thus it is justifiable to check is there any connection between the global futures prices and the agricultural production in AP Vojvodina.

Table 1. Descriptive statistics of agricultural production changes and futures price changes

	Mean in %	Minimum	Maximum	St. dev.	Skewness	Kurtosis	JB
Panel A: Annual agricultural production changes							
Corn	0.485	55.990	-65.768	42.453	-0.214	1.733	0.969
Wheat	1.823	28.325	-27.550	17.796	-0.132	2.075	0.501
Oats	-1.874	30.131	-35.676	18.891	0.000	2.206	0.342
Soybean	4.244	44.679	-45.964	29.757	-0.256	1.695	1.065
Canola	28.748	139.801	-86.325	63.422	-0.117	2.519	0.155
Panel B: Annual futures price changes							
Corn	4.252	59.267	-50.357	26.104	0.241	3.918	0.583
Wheat	3.030	56.898	-37.090	28.793	0.463	2.070	0.933
Oats	2.651	35.233	-37.893	23.979	-0.366	2.026	0.804
Soybean	3.042	56.202	-23.154	22.714	0.917	3.254	1.857
Canola	5.543	48.038	-31.338	22.277	0.355	2.568	0.375

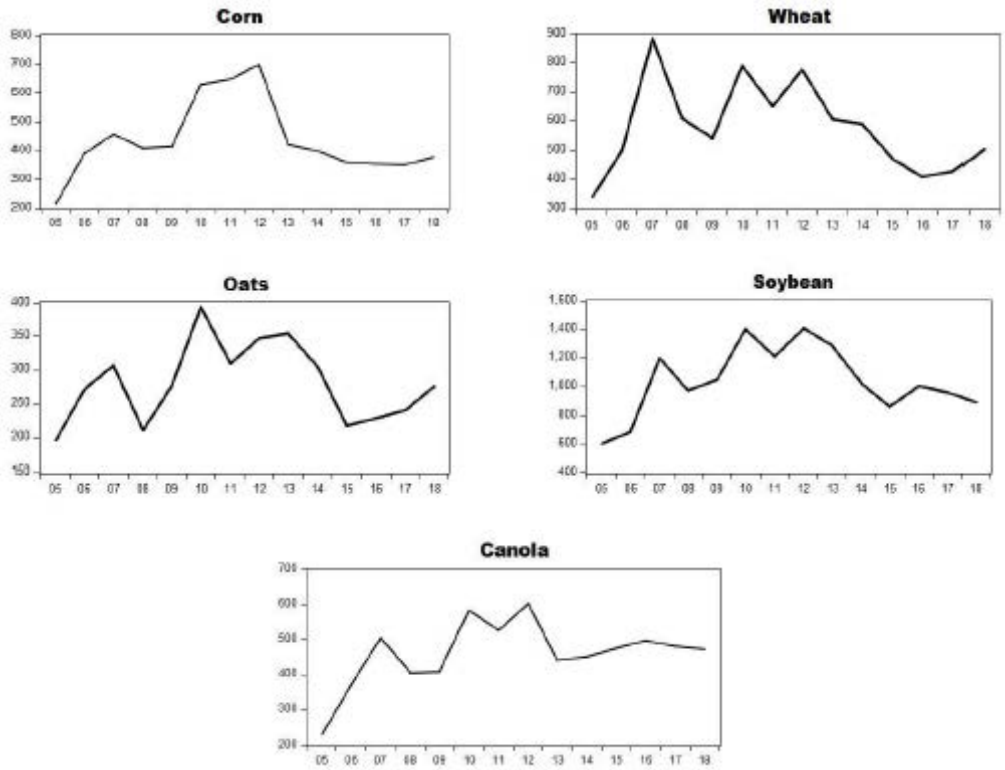
Note: JB stands for Jarque-Bera test of normality.

Source: Authors' calculation.

Taking into account all the selected agricultural commodities, it can be seen in Figure 2 that largest annual production in AP Vojvodina goes to corn, while wheat and soybean follow. Also, it is interesting to note that canola is the only plant which records steady increase in production since 2014. One of the reasons of the increased canola production could be the fact that canola is used in bio-diesel production. According to Mahbub et al. (2019), bioenergy made up to 14% of the total renewable sources of energy production in 2016, while its future production is projected to constitute up to 35% of global energy by 2050. This author contends that among the liquid transportation biofuels, ethanol and biodiesel are the two most widely produced for the global market. Therefore, it is highly likely that Serbian farmers increase canola production because of the growing global demand and steady selling price of this agricultural commodity. Increased canola production in recent years is the main reason why Table 1 reports high yearly production changes in Panel A. In accordance with that, minimum, maximum and standard deviation values are also most pronounced for canola. Corn production

changes also have relatively high standard deviation, which imply relatively high changes in annual production. The reason could be the fact that corn production heavily depends on the number of rainy days in June, July and August, and due to frequent droughts, corn production oscillates considerably. All skewness and kurtosis values are relatively low, which means that all annual agricultural production changes follow Gaussian distribution.

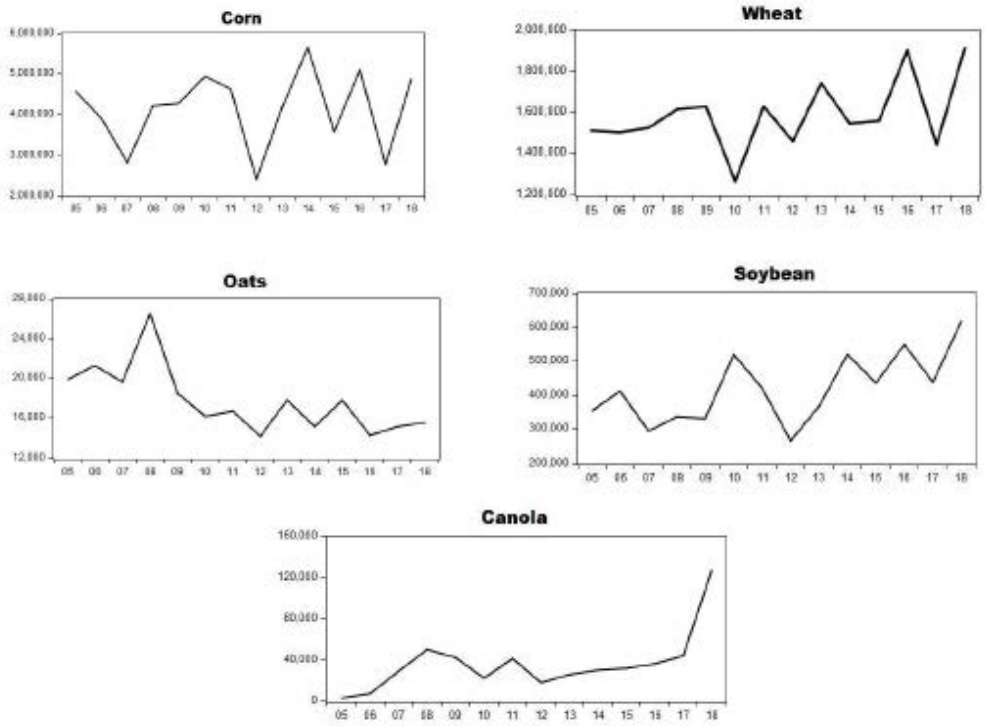
Figure 1. Futures prices of the selected agricultural commodities



Source: Authors' calculation

As for the annual futures price changes, Table 1 reveals that the highest futures price changes have canola, whereas corn, soybean and wheat follow. Standard deviation speaks about unstable market conditions, and Table 1 suggests that wheat futures prices are the most unstable, while corn and oats follow. As in the cases of the annual production, all agricultural futures prices have relatively moderate skewness and kurtosis values, which implies normal distribution. Only soybean has relatively high skewness (0.917), meaning that soybean has the highest concentration of positive changes around the mean. But yet again, this value is sufficiently low to fit normal distribution.

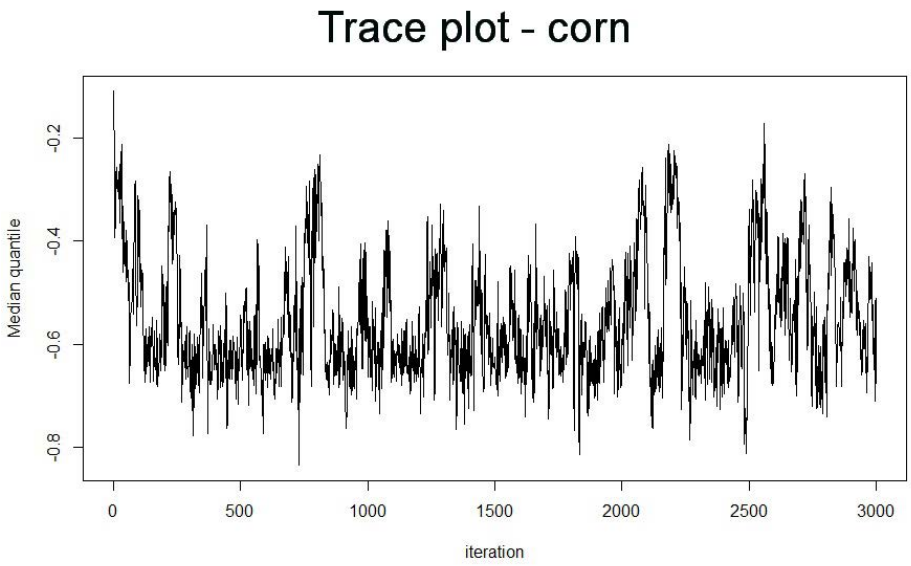
Figure 2. Annual production of the selected agricultural commodities in tons



Source: Authors' calculation

Since this paper uses Bayesian quantile regression methodology, it is necessary to check the validity of the estimated Bayesian QR parameter. For that purpose, the paper relies on the visual inspection of the MCMC chains' convergence, which shows the evolution of the MCMC draws over the iterations. For our computational purposes, we use 3000 iterations. Figure 3 presents the trace-plots of the MCMC chain of the median quantiles, $\hat{\beta}(\tau) = 0.5$, regarding the transmission effect from corn futures price changes to corn production changes. It is evident that trace-plot show a good performance, in terms that the effect of the initial values of the MCMC chains wears off very fast, while the MCMC sampler quickly moves to the stationary distribution. These findings undoubtedly confirm that the estimated median Bayesian quantile parameters are reliable. In order to preserve space and due to the fact that the trace-plots of all other commodities across all quantiles are very similar, we present in Figure 3 only trace-plots for the corn case, whereas all other trace-plots can be obtained by request.

Figure 3. Trace plots for the median quantile of corn



Source: Authors' calculation

Research results

This section presents and explains estimated Bayesian quantile parameters. In the process of Bayesian QR estimation, this paper considers five quantiles of the dependent variable distribution, i.e. $\tau = 0.05$, $\tau = 0.25$, $\tau = 0.5$, $\tau = 0.75$ and $\tau = 0.95$. In other words, selecting these quantiles, we can grasp how futures price changes influence agricultural production in AP Vojvodina when this annual production was very low, low, moderate, high and very high, respectively. As have been said previously, the impact of futures price changes on agricultural production changes is assessed in two ways – contemporaneously and when futures price changes are observed from the previous period. Accordingly, contemporaneous effect is the first one to be examined, and Table 2 contains these estimated QR parameters. In addition, Figure 4 presents their graphical illustration. Table 2 shows that the majority of the estimated QR parameters bear negative sign, which means that increase in futures price changes negatively affect agricultural production of the selected plants in AP Vojvodina. These results have not logical foundation, and it means that current agricultural futures prices do not have influence on the agricultural production in AP Vojvodina, particularly for the cases of corn, wheat, oats and soybean.

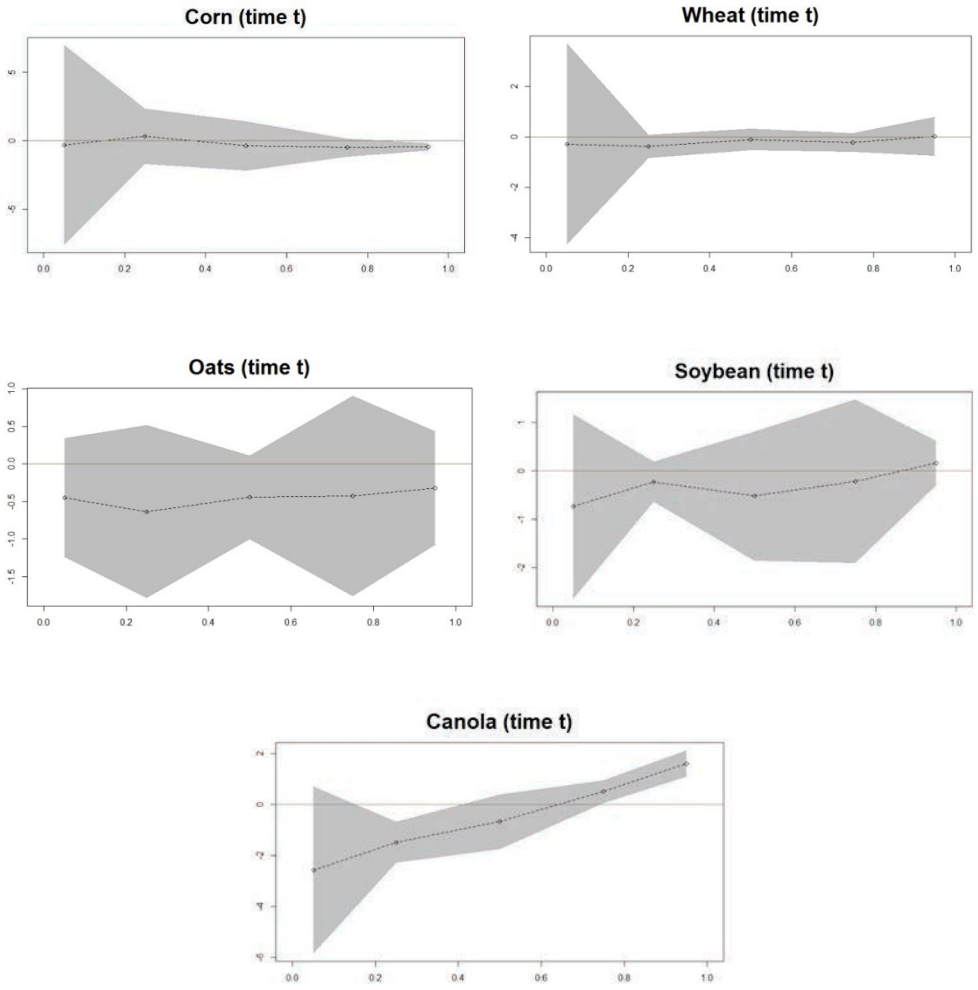
Table 2. Contemporaneous spillover effect from the futures price changes to the agricultural production changes

	Quantiles				
	0.05	0.25	0.5	0.75	0.95
Annual total production	**Very low**	**Low**	**Moderate**	**High**	**Very high**
Corn	-0.300	0.304	-0.589	-0.471	-0.235
Wheat	-0.318	-0.372	-0.102	-0.224	0.020
Oats	-0.458	-0.577	-0.430	-0.422	-0.331
Soybean	-0.741	-0.229	-0.531	-0.233	0.168
Canola	-2.590	-1.480	-0.668	0.503	1.200

Source: Authors' calculation

To be more precise, in the case of wheat, all QR parameters have negative sign, while the right-tail quantile is very close to zero. In the case of oats, all QR coefficients are negative, without exception. As for corn, all quantiles are negative, while only τ^{25} quantile is positive and relatively high (0.304), which means that it has economic significance. However, this is pretty much odd, because it implies that in years when corn production was low, a 100% increase in current futures prices influences the rise in corn production by 30%. Logically, it does not make much sense. Therefore, a viable explanation could be attributed to the fact that our sample covers relatively low number of observations, thus the estimated τ^{25} quantile is probably just an outlier. In order to confirm this suspicion, an additional estimation is conducted in the case of corn, but this time, the neighboring quantiles next to τ^{25} are estimated, i.e. τ^{15} and τ^{35}. In this way, it could be confirmed/refuted whether τ^{25} quantile is only an exception. In the repeated estimation, τ^{15} quantile is -0.229, whereas τ^{35} quantile amounts -0.338, which means that τ^{25} quantile is only a random deviation. Therefore, it could be concluded in the case of corn that current futures price changes do not affect annual corn production, which is similar to the wheat and oats cases. In the case of soybean, only right-tail quantile is positive, while all others are negative. This means that in years when soybean production is very high, current futures prices affect current soybean production by 17%, which is relatively low.

Figure 4. Graphical illustration of the estimated quantile parameters, regarding the contemporaneous spillover



Note: The shaded area gives the adjusted credible intervals at 95 percent probability.

Source: Authors' calculation

On the other hand, in the case of canola, the results indicate that current futures prices have an effect on canola production in AP Vojvodina in the years when this production was high or very high. This assertion is based on estimated τ^{75} and τ^{95}, which amounts 0.503 and 1.200, respectively. This means that 100% increase in the canola prices exerts 50% and 120% rise in canola production in the years when canola production was high or very high, respectively. As have been said in the previous section, canola is an important feedstock used in a production of bio-diesel, and this could be the

reason why global canola prices affect production of this plant in AP Vojvodina. This contention is in line with the paper of Baroi et al. (2014), who explained that biodiesel yet cannot compete with the diesel because of its higher production price. However, this cost can be reduced by using low quality and cheaper feedstocks such as used cooking oil, yellow grease, and green seed canola oil.

Besides estimation of contemporaneous effect, this paper also considers the transmission effect in the case when the futures prices from the previous year are took into account. This scenario, by all accounts, is more realistic than the previous one, and Table 3 reports these results. In addition, Figure 5 increases transparency by providing a visual inspection about the estimated QR parameters. Table 3 indicates that QR parameters are significantly different comparing to QR parameters in Table 2, which justifies consideration of both approaches. However, unlike results in Table 2, quantile parameters in Table 3 are mostly positive and relatively high across the quantiles. This means that global agricultural prices from the previous year present some kind of benchmark for Serbian farmers when it comes to their decision about the size of planted areas. In other words, in the case of corn, positive parameters are found at τ^{05}, τ^{25} and τ^{50} quantiles, which is a strong indication that corn production in AP Vojvodina depends in a certain amount on the global corn prices, which is expected. On the other hand, in years when corn production is high or very high, estimated QR parameters are negative. At first glance, these results could look perplexing, but they actually enhance the credibility of the previous assertion. The rationale for these findings could be as follows. Production of corn is highly dependent on weather conditions. Consequently, it means that in those years when weather conditions were favorable for corn, production of this plant was high or very high, and these levels of production have nothing to do with the global corn prices, as τ^{75} and τ^{95} quantiles indicate. This explanation concurs very well with the assertion of Haile et al. (2017), who explained that weather extremes, such as shocks in both temperature and precipitation during crop growing months have serious consequences on the production and supply of agricultural commodities.

Table 3. Spillover effect from the previous year futures price changes to the current agricultural production changes

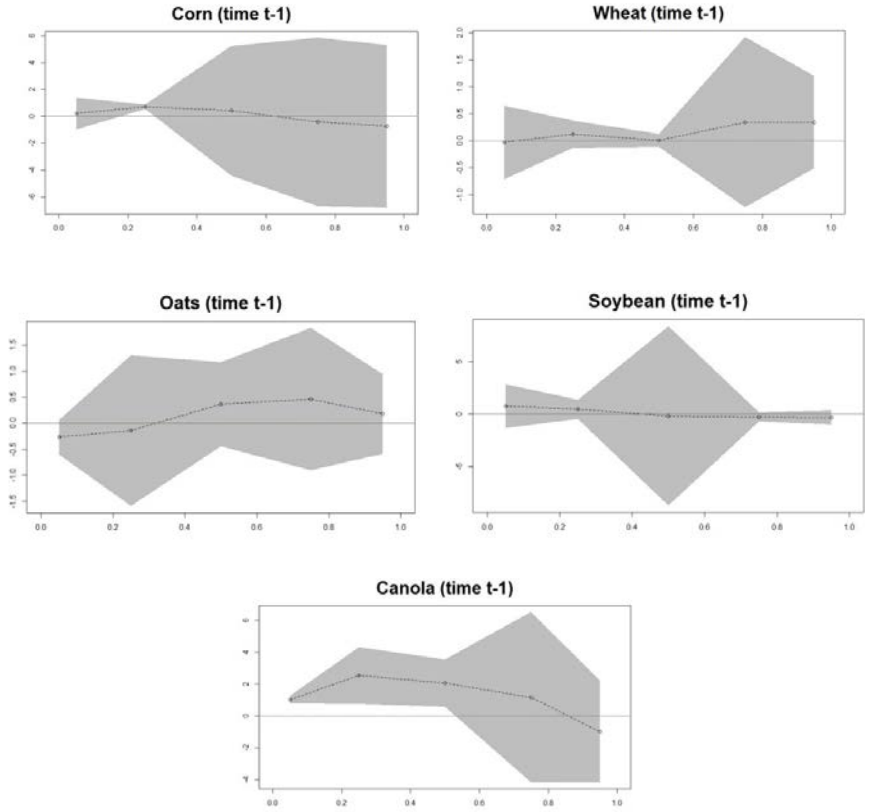
	Quantiles				
	0.05	0.25	0.5	0.75	0.95
Annual total production	**Very low**	**Low**	**Moderate**	**High**	**Very high**
Corn	0.213	0.724	0.412	-0.410	-0.777
Wheat	-0.044	0.122	0.008	0.350	0.348
Oats	-0.267	-0.150	0.359	0.460	0.189
Soybean	0.783	0.454	-0.269	-0.257	-0.317
Canola	1.020	2.530	2.070	1.017	-1.000

Source: Authors' calculation.

According to Table 3, the same explanation could be applied for soybean. Soybean is also a culture, which requires relatively high water-saturation levels of soil, implying that in those years when there were enough rainy days, soybean production was relatively high. In that regards, in years when soybean production was moderate, high or very high, rising soybean prices did not have influence on the levels of soybean production, as τ^{50}, τ^{75} and τ^{95} quantiles suggest.

As for the case of wheat, four out of five quantile parameters are positive, only the first one is negative, while in the case of outs, three out of five QR parameters are positive, and the first two are negative. These cereals are not so water-demanding as corn and soybean are, thus QR parameters suggest that rising global prices of these agricultural commodities positively influence production of these cultures in the years when production of these cereals was relatively high. As a matter of fact, this influence for these two cereals ranges between 35-45%, depending on the observed quantile.

Figure 5. Graphical illustration of the estimated quantile parameters, regarding the spillover effect from the previous year futures price changes to the current agricultural production changes



Note: The shaded area gives the adjusted credible intervals at 95 percent probability.
Source: Authors' calculation.

Table 3 indicates that positive QR parameters for canola are far the largest, comparing to all other QR parameters of all other plants. Their values range between 100-250%, which strongly suggests that canola futures prices have an effect on production of this plant in AP Vojvodina. Comparing to Table 2, this effect is much higher. It is found that right-tail quantile parameter is negative, which means that in years when canola production was at its highest levels, global canola futures prices did not contribute to these production volumes. The explanation for this finding is similar as in the corn and soybean cases. Canola is big water consumer, and if rainy days are sufficient enough and well distributed during the vegetation season, canola yields could be significant. However, it does not mean that global futures prices have any effect on canola production in those very favorable years for canola. Bayesian QR parameters confirm this assertion very well. In addition, our findings are in line with the assertion of Pejanović and Gajdobranski (2012), who asserted that the production of oilseeds in Serbia is characterized by an upward trend, which is positive for price signals from the world market. Rising global demand for oilseeds, stemming from rising biofuel production and growing pre-oil demand, influences a higher price trend that will probably continue to grow in the future period.

Conclusion

This paper investigates whether global agricultural futures have any influence on the annual agricultural production in AP Vojvodina, which have never been done thus far. Five agricultural commodities are taken into account – corn, wheat, oats, soybean and canola. For the estimation purposes, the study uses robust Bayesian quantile regression, which can produce efficient quantile estimates even in low data setting. Besides, two scenarios are considered – 1) current futures prices, and 2) futures prices from the previous year.

Estimated results clearly indicate that current futures prices do not affect current agricultural production of corn, wheat, oats and soybean in AP Vojvodina, since the estimated quantile parameters have negative sign or they are very small. These findings indicate that Serbian farmers do not take into account current futures prices when they make decisions how many hectares and of which culture they will plant. These results are in line with the expectations. On the other hand, when futures prices from the previous year are analyzed, the majority of estimated QR parameters bear positive sign, which means that Serbian farmers take into account in greater or lesser extent the global agricultural prices when they plan their annual agricultural plantation. According to the findings, canola futures have the greatest effect on the rising Serbian canola production, comparing to all other agricultural commodities. One of the reasons for such results could be the fact that canola is used as feedstock in an ever-growing production of bio-diesel. Thus, the hypothesis that has been set on the beginning of the researched has been confirmed.

The major novelty of this study is the usage of unconventional and very innovative Bayesian quantile regression, which can provide reliable QR parameters even when the research is limited with the availability of empirical data, which is the primary advantage of this approach. In addition, this study has shown that Serbian farmers are ready to take into account futures prices when they plant their annual agricultural plantation, which is very positive and somewhat unexpected conclusion. In other words, it gives us an indication that Serbian farmers are aware that they can protect themselves from

the agricultural price changes on the world market simply by taking a long position on futures contracts. Of course, future studies will confirm or refute the results from this paper, using richer dataset and applying different methodology.

Acknowledgements

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Conflict of interests

The authors declare no conflict of interest.

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THE CONSUMPTION OF ORGANIC FOODS BY THE STUDENT POPULATION IN THE REPUBLIC OF SERBIA

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ABSTRACT

The beginning of the 21st century has noted a change in the attitude of modern man towards health and the pursuit of a healthy lifestyle. Thus, particular emphasis is placed on the importance of a healthy diet and a healthy lifestyle. The importance of nourishing nutrition and health-related issues has been recognized and raised on the state level. Thus, numerous national campaigns promote healthy nutrition aimed at improving the overall health of the nation. Health in general, as well as healthy eating habits, are today very important political and economic issues in developed countries. On the contrary, in underdeveloped countries, food shortage is not uncommon. The Republic of Serbia has high-quality and healthy food, but consumer awareness regarding this issue is insufficiently developed. The aim of this paper is to determine the level of the consumption of organic foods by the student population and the awareness of good nutrition and a healthy lifestyle. The research was conducted in the Danube Region within the Republic of Serbia.

Introduction

In the EU food market, different food labeling schemes co-exist with the aim of informing customers and providing trust on different quality characteristics of food

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products (Gracia, de-Magistris, 2015). According to European research papers dealing with consumer attitudes towards food and the importance of nutrition for health, health is one of the four most important reasons for making specific food choices. It should be noted that there are some differences in food consumption between individual countries in terms of consumption of fruits and vegetables or the avoidance of fatty foods, as well as attitudes towards natural foods.

The five most important factors in fifteen European countries which influence food choices are the quality or freshness of food, price, taste, health and preferences or wishes of the household members. The results of a US-related research have shown that the most important factor is the taste of food, followed by the price or costs associated with food consumption, nutrition, convenience and issues related to obesity.

Over the last decade, the organic food sector has been one of the fastest growing segments in the global food market (Sahota, 2015). The extensive amount of the research that is carried out into the relationship between organic food and health defines „health as one of the primary reasons why consumers buy and consume organic food (Zanoli & Naspetti, 2002).

Many of the final consumer surveys analyzed the reasons for buying healthy food. In general terms, consumer health and food safety are the most important reasons for purchasing healthy foods. For example, the basic reasons for buying organic products are usefulness, a lack of chemicals, ecology and a good taste; while the appearance of food, ease of preparation and convenience to maintain a normal weight is of a minor importance to the consumers of these products, relative to the general population.

The purchase of organic products reflects the lifestyle of consumers, and it is linked to their system of values, attitudes, and especially with their ecological awareness. For example, organic food purchasers belong to the group of dedicated 'green' consumers. Such customers consider themselves responsible for their health and believe that it is influenced by the choice and consumption of food. They also know more about nutrition than other consumers and are willing to undergo some extra costs, the appearance and ease of food preparation.

Consumption of organic food in the Republic of Serbia

Organic agriculture protects the natural environment and is a prospective activity in the economy, as it contributes to the optimal use of resources, the development of rural areas and villages, sustainable exports, economic growth, and the increase in living standards (Lazić, 2010). The market and the demand for organic products are constantly increasing, and the areas under this production are increasing from day to day (Golijan, Popović, 2016).

Consumers in the European Union spent 23.9 billion euros on organic food (Kranjac,et al, 2017). Germany is the biggest organic market in Europe with a share of 30% of retail sales. It is followed by France (18%), the United Kingdom (9%) and Italy (8%)

(Heinze, 2016). Total areas under the organic production in the Republic of Serbia stretch on area of 15,298.02 ha (Ministry of Agriculture and Environmental Protection, 2016). The food increasing production, competitiveness and accelerated development and introduction of agrarian policy instruments that allow dynamic restructuring of the agricultural sector (Zakić, Bugarčić,Milovanović,2017).

Organic agriculture is the most acceptable form of agriculture in regards to ecological criteria, and it has a far wider meaning than the usual explanation of "agriculture without the use of chemicals" (Vlahović et al., 2011). Organic food is hygienically correct and safe with an increased biological and nutritional value, a high content of vitamins and minerals, as well as promoting and improving biodiversity, biological cycles and activities (Ristić, Bošković, Knežević, 2018). We have a lot of difference between organic and conventional food production, table 1.

Table 1: The difference between organic and conventional food production

Organic production	Conventional production
Using organic fertilizer	Using synthetic fertilizer
Reduced processing	Intensive processing
Mechanical weed destroying	Use of herbicides
Regulating fertility, pests, illnesses and weeds	Use of pesticides and other chemicals
Pollination with bees and other insects	Use of suspensions
Water distribution with capillary action	Irrigation
Preserving flora and fauna diversity	Killing insects with insecticides
Composting, returning herbal remnants to the ground	Use of synthetic soil improvers ground
Environmental protection	Pesticide pollution

Source: Ristic, at al., 2018

Research carried out in the Republic of Serbia during the previous period has shown that organic food producers need the most financial support from the state by subsidizing organic production and obtaining the necessary certificates. The problem is a long waiting period for financial backing, as well as high prices of raw materials (certified seeds) and organic fertilizers.

Djokić, Grubor, Milićević and Petrov (2018) point out that those mostly inclined towards organic foods are consumers who, according to their lifestyle, are 'adventurers.' These consumers are considered (Grubor, Djokić, Milićević, 2018) to be the most educated, to include the whole family in the process of preparing food, and to readily

accept culinary innovations. In addition, the biggest obstacle to increasing the future consumption of organic foods in this segment is not the premium price of organic food, but the problems of its availability on the domestic market.

Most organic food producers see an improvement in the position of exporting produced organic foods and believe they can satisfy potential foreign buyers.

Empirical research

In order to examine the consumption of organic food by students in the Danube district within the Republic of Serbia, a survey was conducted in 2018 on a sample of 150 student respondents.

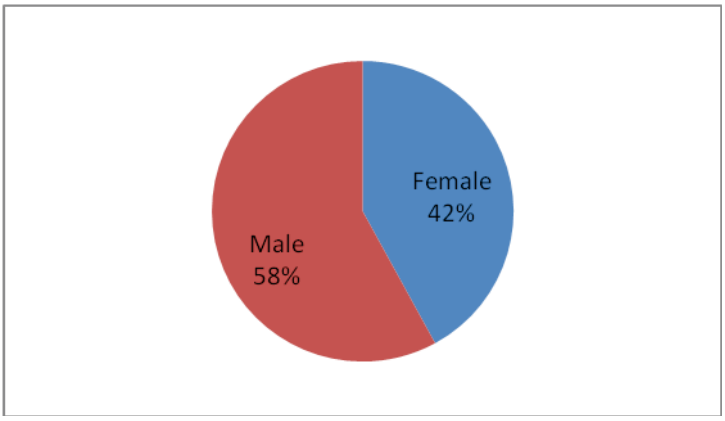
Students were questioned about their eating habits and the possibilities of production and consumption of organic food. All respondents are from the Danube Region, primarily the territory of the town of Smederevska Palanka and its surroundings.

Research results

Analysis and presentation of results:

The survey involved 150 respondents, of whom 87 were male (58%) and 63 female (42%), figure 1..

Figure 1. Structure of respondents.

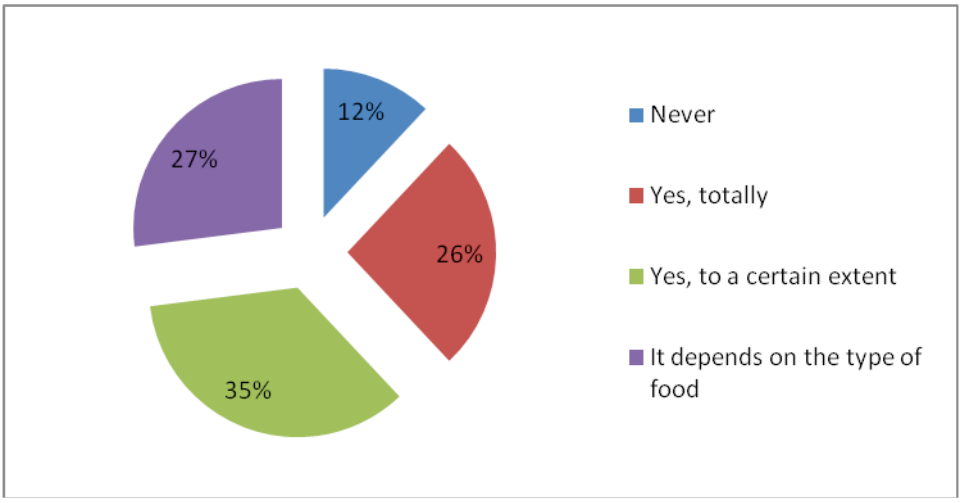


Source:Author's calculation

In terms of educational structure, a survey carried out through a questionnaire on a sample of 150 respondents showed that 91% of respondents have a secondary school degree, 7% of students are students with a Bachelor's degree and only 2% who are with Master's degree.

The food quality in Serbia is not equal to the quality in the European Union although the prices are European, and in some cases, such as meat and meat products, they are higher by 20 to 30 percent.

Figure 2. Does the price of food affect your choice?



Source:Author's calculation

According to the results, price is a very important factor when choosing food. Namely, 52 students replied that the price affects their choice of food to some extent, 39 students said that the price totally affects the choice of food, 41 respondents answered that this depends on the type of food, while 18 students answered that food choice is never affected by the price, figure 2.

According to these results, the following can be concluded: the price of food is a very important factor, which, considering the living standard of the population of Serbia, in this case student income, could be perceived as logical. More than half of the respondents considered the price to be a limiting factor when shopping for groceries.

The analysis further explores whether price has an impact and what kind, depending on the gender and age of the respondents.

The organic food production process is more complicated and therefore more expensive, which is reflected on its final price - organic products in our country can be up to 40% more expensive than those from the conventional agricultural production.

By using an example, we will show the difference between these two types of production. The production of organic bread in many ways differs from the production of the ordinary kind. The entire production process takes place in ecologically strictly controlled conditions. Organic wheat has no residue of heavy metals or chemicals which means that the wheat, barley, oats or rye used to make these products are not sprayed with pesticides and herbicides, but protected and fertilized by natural materials. Also, cereals are ground on stone. Therefore, the costs of organic bread production are higher so it is not possible to buy that sort of bread for 40-50 dinars, which is the price of white bread. In fact, a loaf of organic bread weighing 300 grams costs 109 dinars, while a loaf

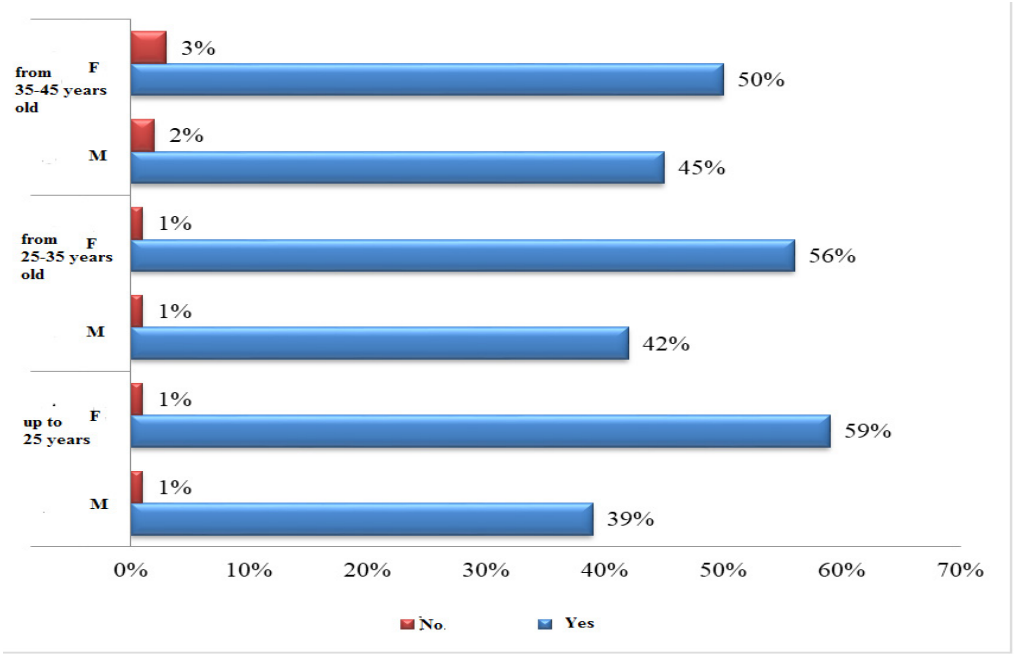
of bread with a sprinkling of flax, sunflower and pumpkin seeds of the same weight is 139 dinars.

As already noted, food quality in Serbia does not match up to EU quality but the prices are European, and in some cases, such as meat and meat products, higher by 20-40%. Also, Serbian consumers, due to poverty and deprivation, are driven by the price when buying certain products, especially cured meat products, so they are not selective. Rather, they purchase according to what they can afford, even at the expense of their own health.

Research has shown that a number of students spend a large sum of money on food. As many as 98 students answered that they shelled out a lot of money for food, while 52 students replied that they did not set aside a lot of money on food.

When we compare the replies in regards to the gender and age of the respondents, we also get similar data regardless of the gender and age of the respondents, which can be seen in Figure 3.

Figure 3: Separating money for food, depending on the gender and age of the respondents



Source:Author's calculation

Based on Figure 3. we can conclude that absolutely all respondents, both male and female, allocate a large sum of money for food, which only confirms the fact and the reality that "Serbia has the lowest standard but on the other hand, it also has European prices."

The average expenditures for personal household consumption in Serbia in 2018 were on average 54,323 dinars per month.

According to the results, as many as 40 students answered that they allocate from 10,001 to 15,000 dinars a month for food, 34 students said that they spend 5,001 to 10,000 dinars per month, 30 students up to 5,000 dinars, 17 students consume food to the amount of 15,001-20,000 dinars, while 16 students answered that they shell out 20,001 to 25,000 dinars per month for food. Also, there were 2 respondents who spend over 30,000 dinars per month for food.

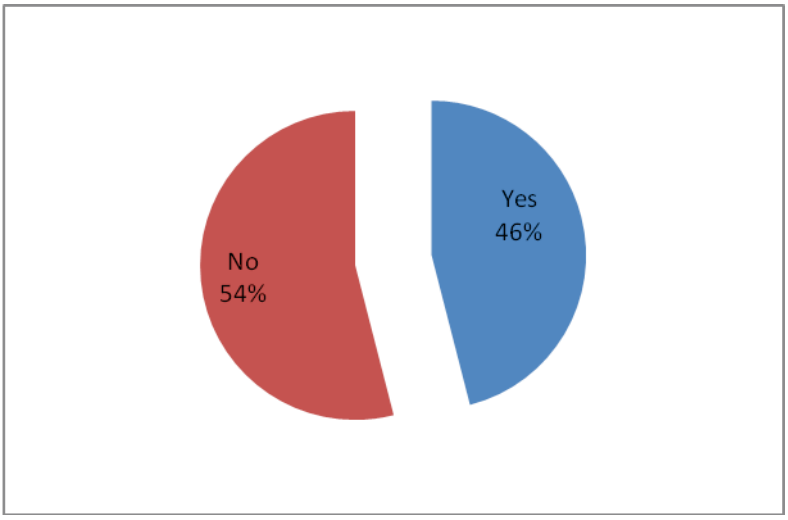
According to these results, it can be concluded that the monthly average which students spend on food is between 10,000 and 15,000 dinars.

The modern pace of life affects our eating habits in a negative way. Various Serbian and international research carried out in previous years show that Serbian citizens have unbalanced diets, fail to consume enough fruits and vegetables, and often make mistakes when choosing and preparing food.

Thus, as a result of bad eating habits, there is a noticeable growth in the number of overweight and obese persons in Serbia. Experts say that the basic principle of proper nutrition can be summarized in three words: moderate – diverse - adequate.

Meals should be diverse. By consuming only fruits, vegetables and cereals, a sufficient amount of minerals and vitamins is sure to be ingested. Eating foods containing healthy fats, such as olive oil, fruits and blue fish, keeps us healthy.

Figure 4. Do you think you eat healthy?



Source:Author's calculation

The results show that the largest number of students - 81 or 46% - consider that they do not eat healthy, while 69 or 54% claim they have healthy eating habits.

According to these results, it can be concluded that among the 150 students surveyed, the majority claimed they had unhealthy eating habits, which can be linked to several factors, such as poor eating habits, a fast pace of life associated with everyday stress, as well as the price of groceries which was identified as the limiting factor for purchasing groceries.

Organic food contains no additives allowed in inorganic foods such as hydrogenated fats, aspartame or artificial colors and flavors. It also has no pesticides or herbicides - the causes of many diseases, as well as GM compounds. By its composition, organic food has significantly higher levels of vitamins and minerals.

Research has shown that organic food contains, for example, an average of 63% more potassium, 73% more iron and 125% calcium than products obtained by conventional agriculture, and the share of dry matter content in organic products is higher by up to 30%. In order for some vegetables to be regarded as organic foods, they must be grown according to the following rules:

a) Pesticides cannot be used, or herbicides and similar agents. Organic food must be grown at least three years without chemicals.

b) The fields must have clear boundaries so that plants have no contact with chemicals from the neighboring fields.

c) Genetic engineering is prohibited - everything has to be in line with nature.

d) Pest problems are solved naturally - by setting traps and baits.

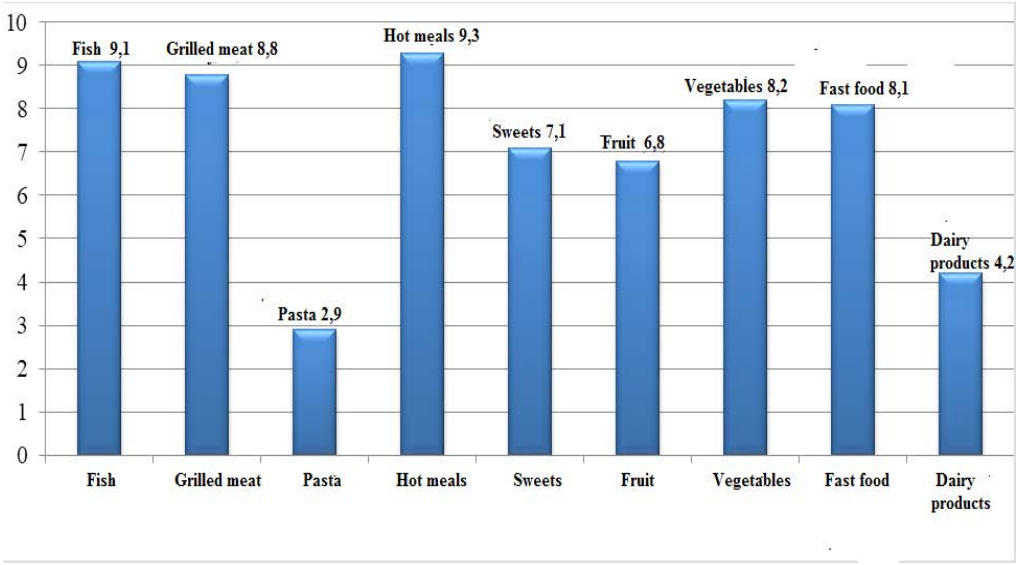
When it comes to organic foods of animal origin, the rules are as follows: there are no hormones that artificially promote growth, drugs or other artificial agents in animal nutrition.

Does organic food really have a beneficial effect on health? There is clear scientific evidence of the positive impact of organic food on human health. Research in Germany has shown that organic products have a significantly higher content of oligo minerals, especially potassium and iron, as well as a higher level of magnesium, phosphorus and vitamin C. Similar results have also been obtained in the USA, where it was established that these products account for 63% more potassium, 73% more iron and 125% more calcium than products from conventional agriculture. According to the World Health Organization (WHO), 1-5 million cases of pesticide poisoning are recorded annually, with 20,000 fatalities. It is products of animal origin of unverified quality, the most common sources of alimentary toxinfection, that usually end up on the market.

There were almost no vegetarians among the students. Namely, 148 students who participated in the survey responded that they were not vegetarians, and only 2 respondents confirmed that they were not meat eaters.

In most cases, the students eat in fast food restaurants as it is cheaper. When they have time, they consume hot meals in the canteen, and when they are busy with their daily activities, they usually buy fast food. In general, students eat in the way their daily commitments and finances allow them to.

Figure 5. Rate on a scale of 1-10 how often you ingest the given foodstuffs.



Source:Author's calculation

Students prefer to eat cooked meals, rating them by an average of 9.3. Following that, they like to eat fish - 9.1, grilled meat - 8.8, vegetables - 8.2, fast food - 8.1, sweets - 7.1, fruits - 6.8, dairy products - 4.2, while the least students prefer to eat pasta - 2.9. The general conclusion is that students mostly like hot meals that are prepared in their own homes.

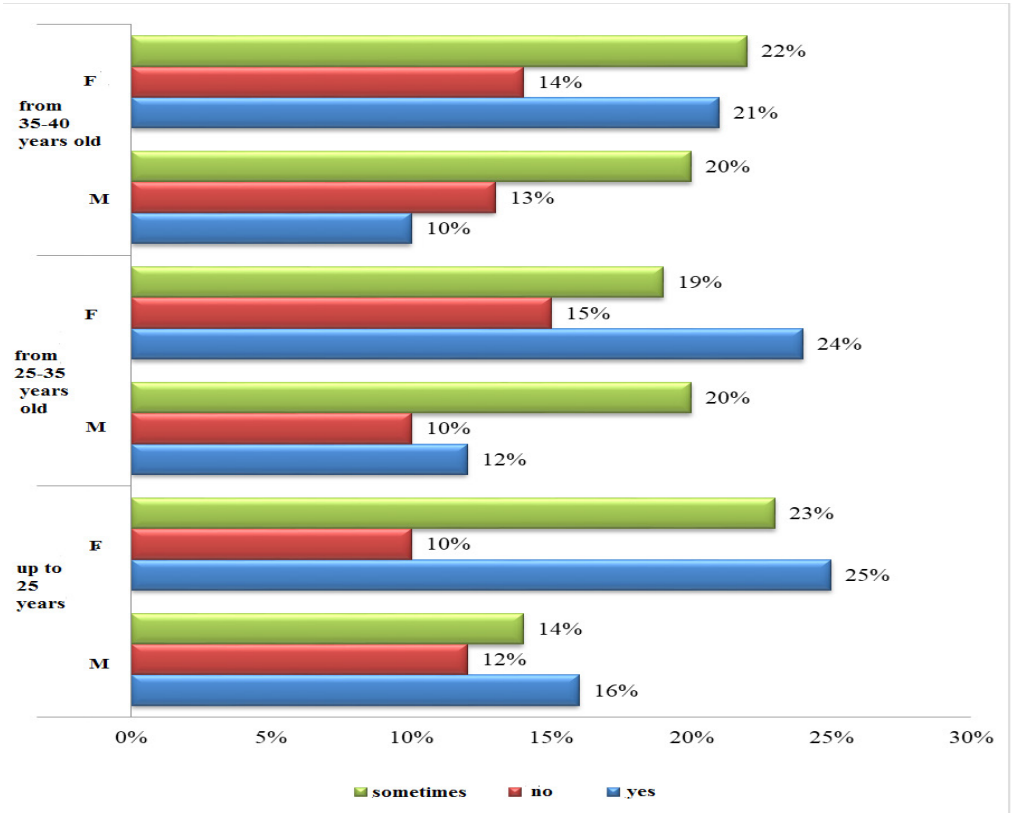
A number of student drives took place in Smederevska Palanka in April of 2018. Within the framework of the "We choose proper nutrition in order to be healthier" drive which was held in front of the Institute for Student Health Protection of Smederevska Palanka, an exhibit of foods recommended for everyday nutrition was presented. Students from various departments prepared meals made up of fresh fruit and vegetables, and the Institute volunteers provided information on the importance and nutrition of certain foods, as well as their preparation.

Also, student volunteers polled their peers about their eating habits, as well as sharing promotional health education materials, determining the quantity of nutrition and pointing out the importance of preventive screening. This was also an opportunity to interview several participants (students).

The results obtained were as follows: 65 students claimed that they cook regularly, 53 students liked to cook occasionally, 32 students said they disliked cooking. This result can be connected with extra free time that enables this type of activity, or insufficient finances for restaurant meals.

Generally speaking, most students of all ages dislike cooking, although a number like it, and the female respondents were the majority in the overall structure of the surveyed students, as was expected.

Figure 6. Do you cook (depending on the gender and age of the respondents)?



Source: Author's calculation

We can conclude that students have no habit of cooking. Whether this occurs due to ignorance, or in the belief that insufficient funds fail to provide quality ingredients for a good meal can be examined in a further analysis.

Based on numerous research by the Ministry of Youth and Sports of the Republic of Serbia, there is the conclusion that as many as 25% of students are not involved with sports, and many, even at an early age, suffer from problems with joints, stomach pains and frequent headaches.

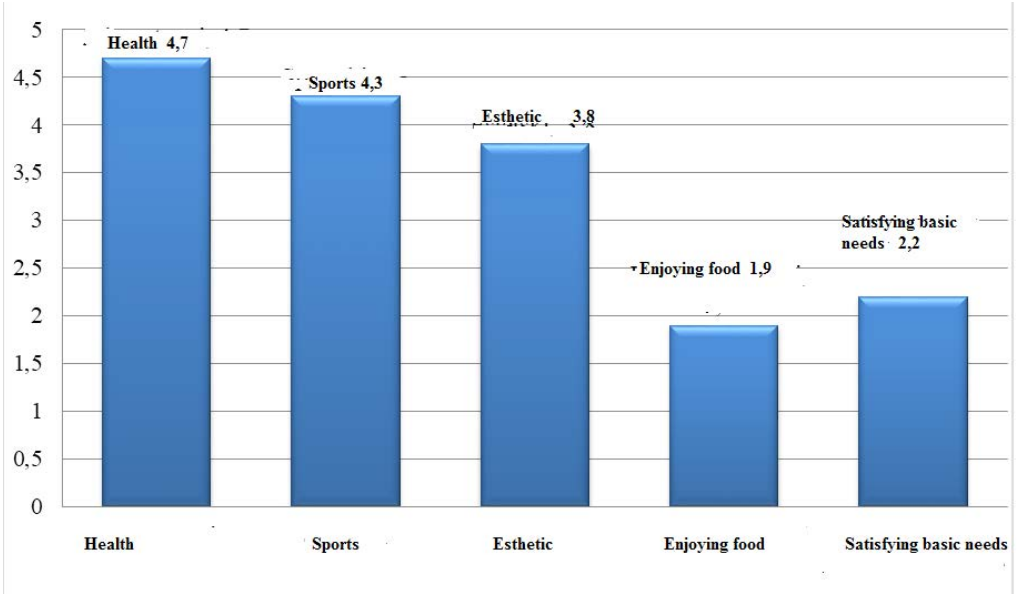
Also, every fourth student is a so-called couch potato, which means they take little or no exercise and spend their free time lying down and eating.

In addition, most students have poor dietary habits and eat mostly ready-made or frozen meals – meaning that food need not be healthy as long as it's fast. The bad diets of the students are supported by the number of fast food restaurants that can be found around the university campuses (for example, there are 7 fast food restaurants around the Smederevska Palanka university site, which only confirms the previously stated).

According to the survey, 71 respondents stated that they prefer to eat at home, 54 students enjoy eating in fast food restaurants, while 25 respondents like to eat in fine restaurants. According to these results, it can be concluded that the majority of students like to eat at home. This result can be linked to a previous conclusion whereupon most students like to cook, as well as the existence of the limiting factor for fine restaurant dining – in short, money.

When it comes to the reasons for students choosing food, they were ranked from 1 to 5 in the following results. When choosing food, most students answered that health reasons were the most important, ranking health with the highest average score of 4.7.

Figure 7. Rate reasons on a scale of 1-**5: your choice of food type?**

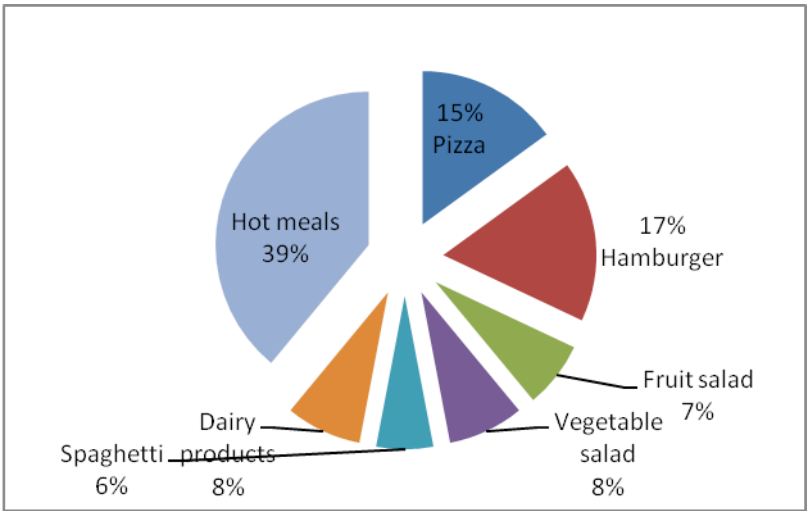


Source: Author's calculation

Following health reasons, students rated sports with the average mark of 4.3, then esthetic reasons with an average mark of 3.8. The lowest average score was satisfying basic needs with a score of 2.2 and enjoying food with an average mark of 1.9. According to these results, it can be said that most students pay attention to food choices and that health reasons are the most important.

The largest number of students (58 respondents) filled in the additional field in the questionnaire, claiming their favorite food were hot meals. After this, 26 students preferred a burger, 23 students liked pizzas, while 12 students opted for fruit salad or dairy products as the additional option.

Figure 8. If you could choose, which foods would you opt for?

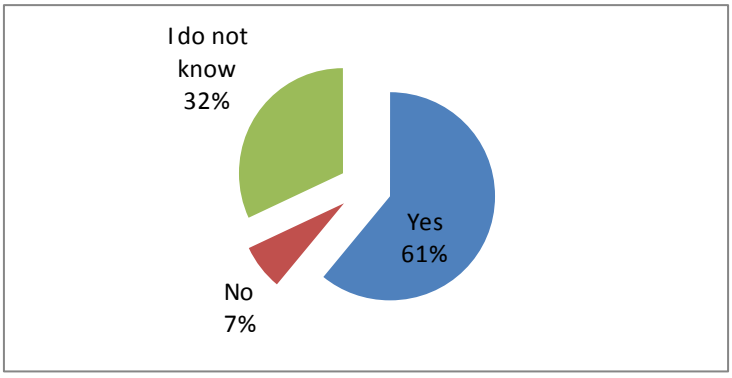


Source: Authors calculation

According to these results, at least 9 students selected spaghetti as the additional option in the questionnaire. According to these results, it can be seen that the largest number of students like hot meals, which can be linked with previous questions regarding their preference for domestic meals.

The question arising is this: what is healthy today, especially when we are inundated with information about contaminated and genetically modified foods? Healthy eating "requires a lot of money," many people claim. They also state that sports also take time and money, and since that is untrue, the claim is rejected.

Figure 9. Do you think that there is a healthy diet nowadays?



Source: Authors calculation

According to the results, 91 students think that healthy food exists today, 48 students answered with 'I do not know,' while 11 students answered that such as thing as healthy food does not exist.

Based on this, we can conclude that a large number of respondents lacks the necessary information on the basis of which they could conclude whether there is healthy food today. This could be amended by introducing certain subjects through school curricula primarily in primary and secondary education, so that all students can have the necessary information.

It is very difficult to know what we are actually buying at supermarkets or grocery stores - whether the cabbage was picked beside the highway and full of heavy metal exhaust gases or not is hard to weigh up. We don't even have the information how a farmer applies agrotechnical measures: where the vegetable was grown, how much it was sprayed and with what. We have no idea if the nice old woman selling apples really picked them in her garden or bought them from a wholesaler.

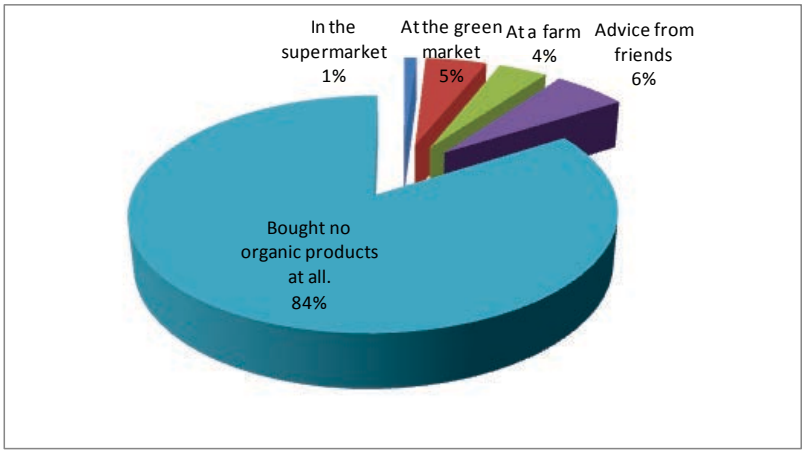
Vegetables and fruits from plantations are grown under controlled conditions, which means that pesticides, insecticides and other products are used as much as it is necessary, and no more than that. Going to the green market can be quite interesting, but you are seriously mistaken if you think that you can find healthy food there.

When shopping, the majority of students pay no attention to the origin and production method of the food products - 51 students. On the other hand, 39 students sometimes pay attention when buying food, while 35 students always check the origin of the food while purchasing. When it comes to GMO, 15 students have no idea what it is, while 10 students claim that they have no idea what organic food is.

According to these results, I can conclude that the majority of students pay no attention to the origin of food when purchasing it, while a substantial number are not familiar with the terms and meaning of GMO.

When asked where they buy organic products, 1 student responded in the supermarket, 6 students said on a farm, 8 students on a green market, and 9 students heeded advice from friends. However, the largest number, 126 respondents, bought no organic products at all.

Figure 10. Where do you buy organic products?



Source: Authors calculation

In addition to the fact that a large section of the students surveyed still lack knowledge of the true meaning of GMO as well as organic foods and all their disadvantages and advantages, this is a somewhat expected result.

Discussions

The student population was submitted to a barrage of questions about their eating habits, from the why and how and with whom students eat, as well as the ways in which students buy, prepare and consume food.

On the basis of a comparative comparison of the results of this research and the international research papers mentioned in the analysis, there is an obvious disagreement in the results and dietary habits of the student population. So far, a number of global and domestic researches have been carried out to compare both organic and inorganic foods. On the one hand, we have those who claim that organic food is healthier because it is nutritionally more useful. On the other hand, some suggest that this food is actually less healthy because it can contain a higher amount of mycotoxins due to pesticides not being used.

In a global sense, as far as nutrition and mycotoxins are concerned, there is no significant difference between organic and conventional foods. Although the level of pesticide residues in conventional foods is controlled and must not exceed a certain limit, organic food undoubtedly has fewer pesticide residues. Based on the research, we come to the conclusion that the price of food is a very important factor, in accordance with the living standard of the population of Serbia; in our case - students. The bulk of students pay no attention to the origin of foods when purchasing groceries, while a substantial number are unfamiliar with the terms and meaning of GMO. Considering the fact that a large number of the students remain in the dark about the meaning of GMO and organic food and all the disadvantages and advantages thereof, this is a somewhat expected result, given the weak response of the manufacturers of this type of food in Serbia, as well as their placement, marketing, and national and local institutions that provide insufficient marketing and market space for these foods.

Conclusions

In our opinion, despite the fact that the younger generations pay little attention to the origin of food, one of the problems and obstacles that could be improved in the coming period is greater media coverage of organic products, which is still lacking due to the aggressive advertising of various other products. If more attention was paid to presenting information of the harmful effects of GMO as well as the benefits of organic food, it is without doubt that a larger number of students would check the origin of the product, as well as where to find and buy organic products.

In addition, it needs to be said that a more aggressive campaign offering general information as well as information about the possibilities of growing organic food and informing others of all its benefits can be organized only with the aid of the state, ministries, local self-governments, etc.

Conflict of interests

The authors declare no conflict of interest.

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ECONOMIC CHARACTERISTICS OF SOUR CREAM PRODUCTION IN SMALL-SCALE DAIRY PROCESSORS IN SERBIA

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ABSTRACT

In Serbia small family households dominate in milk production, while large-scale capacity dairies dominate in milk processing. There are over 200 dairy processing plants, and currently they manufacture about 80% of all dairy products. In this race small-scale dairies are lagging behind. The aim of this paper is to investigate economic characteristics of processing milk into sour cream in small-scale dairy processors in Serbia. The research showed that the cost price of sour cream with a minimum of 20% milk fat is 68.96 RSD/kg. The largest share in total costs has costs of raw material accout for 44.11% and labor costs for 38.79%, while the remaining costs are packaging, transport and other overheads. In order for small-scale capacity dairies to compete with larger-scale capacity dairies, both in product quality and price, it is necessary to continuously monitor and minimize production costs.

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Introduction

Milk and meat are the most important products of cattle production and are of great importance in human nutrition. Milk is recognized as an important source of energy, high-quality protein and essentail minerals as well as vitamins (Paszczyk et al., 2019). Dairy products cannot be substituted in human nutrition. Milk as a source of nutrition is especially important for infants and children, who need nutrient and energy rich food for growth and cognitive development (Garcia et al., 2019). Cattle consumer milk is prevalent at the market in terms of the produced and placed amount, relative to goat's and sheep's milk. The production of goat's milk and milk products has been gaining in importance in recent years as a result of recognizing the role of goat's milk in human nutrition from a health perspective (Popović Vranješ et al., 2017). Developed countries in the world record higher consumption of dairy products. In the same time, less developed countries are dominated by consumption of drinking milk, due to lower prices, lower incomes and lower living standards. The development of processing can significantly affect the overall growth rate of agricultural production and increase the total income of the agro-industrial sector (Zekić et al., 2016). Some of the milk products and semi-finalized products that can be obtained from processing plants are fresh soft and grain cheeses, semi-hard and hard cheeses, yogurt, sour milk, whey, butter, milk powder and kefir.

In the foreign trade of milk and milk products, Serbia has a positive balance and is one of the leading countries in this production in the region (Veljković et al., 2015). Cheese is considered to be the most perspective product in terms of production, marketing and export, but the potential and importance of other milk products should not be diminished. Cheese production in Serbia varies annually, with an average of about 55 thousand tons which is likely to increase (Eurostat, 2019), and according to the data of the Statistical Office of the Republic of Serbia, around 27 thousand tons of cow's milk sour cream is produced annually. This indicates that other dairy products should not be neglected. Serbia exports products with low degree of processing and less value added than imported products (Veljković et al., 2015), which makes it less competitive in the international market.

There are currently more than 200 registered dairy processing plants in Serbia (Vlahović et al., 2018), which can be classified into three groups by annual production: large, medium and small. Milk is by 2/3 processing in dairy plants while significant amount still used and processed on farms (Popović and Panić, 2018). In Serbia milk processing facilities are largely concentrated in a few milk processing companies. These companies participate at about 90% in total milk processing, which means that they dominate the market (Jakšić et al., 2015). Smaller milk producers, who cannot apply for state support, only cooperate with small-scale capacity dairies and thus manage to survive on the market because they are not recognized by large-scale dairies. The advantage of small and medium-sized manufacturers is that they can respond to demand change and fluctuations with an adequate range of products within a short period of time (Popović Vranješ et al., 2017). Only large-scale farmers, who have better quality milk, are

eligible for state support, have higher production volumes, modern and more efficient production technology, can continuously respond to market needs, cooperate with large dairies. Production of large processing capacities is mostly oriented toward liquid dairy products, while cheese production is mainly of less priority (Zekić et al., 2016). Small-scale and medium-scale capacity dairies mainly process milk into cheese, yogurt, kefir, sour cream and the like. At the same time, the consumption of dairy products has recently been marked by the demand for traditional products, that is, products with a certain geographical origin, come from small farms and represent for consumers the synonymous of "healthy" food (Popović Vranješ et al., 2017).

Increase of competitiveness may be based on different elements: product prices, costs of production, new technology, innovation, knowledge, human resources, entrepreneurship, the brand and the quality of the product, etc. (Glavaš-Trbić and Maksimović, 2013). Dairies have to decide on the type of products to be processed, from pasteurized milk to more sophisticated dairy products such as cheese, yogurt and ice-cream. Processing costs, inputs and output costs and milk quality may become critical aspects that influence the decision on how they can respond to market opportunities (Fuentes et al., 2016). In order to survive in the race with large dairies, small dairies strive to improve their organization, make better use of existing capacities, choose the right product range, maintain quality levels, reduce production costs and increase prices and volume of dairy products. Only dairies that are qualitatively and cost-competitive with their products and able to meet quality standards and export their products can survive on the market (Veljković et al., 2015).

The authors analyze the economic characteristics of small-scale capacity dairy processors in Serbia in the production of sour cream. In order to make dairy products more cost efficient, cost effective and competitive in the foreign market, it is necessary to monitor and improve all aspects of their business. This is especially important for small-scale capacity dairies, which, in terms of performance, lag behind medium and large dairies in Serbia.

Materials and methods

Based on the financial analysis of a representative small-scale dairy producer in Serbia, this paper aims to investigate economic characteristics of processing milk into sour cream in small-scale processors. The aim of the paper is to calculate cost price taking into account milk processing costs required to produce cour cream with minimum of 20% milk fat and to discover how and to what extent these costs affect the operation of small-scale processors.

To determine the level and structure of production costs of dairy products, the analytical calculation method of per unit processing costs has been used (Marko et al., 1998), that is, costs have been calculated per kilogram of dairy product produced. The purpose of the calculation is to account the cost price of individual products, as well as to create an information basis for controlling them and evaluating the cost-effectiveness of the

business (Zekić et al., 2015). The economic analysis of milk processing costs required to produce sour cream with minimum of 20% milk fat includes the direct material costs (the cost of raw materials, packaging and labelling), depreciation costs, labor costs (wages) and transport costs.

The analysis is based on the total cost of processing milk into sour cream, which is made up of fixed and variable cost, as expressed in the equation below (Marko et al., 1998):

$$TC = FC + VC$$

where:

TC = Total Cost,

FC = Fixed Cost, and

VC = Variable Cost.

After the calculation of total and individual costs, per unit processing cost is determined. The aim of determining the cost price is to burden each product with the amount of costs that its production has made (Zekić et al., 2015).

To ascertain the share of particular cost in one kilogram of dairy products, it is necessary to divide the total cost by quantity (total product), as shown in the equation below:

$$CP = TC/Q$$

where:

CP = per unit cost or Cost Price,

TC = Total Cost, and

Q = Quantity (total product).

The study includes an analysis of economic characteristics of sour cream production in a small-scale dairy in the period from 2014 to 2016. The data on production features of small-scale dairies is collected through field research, while the analysis of conditions in the milk sector in Serbia is based on the official data and publications of The Statistical Office of the Republic of Serbia and Euro statistics.

Results with Discussions

Sour cream characteristics

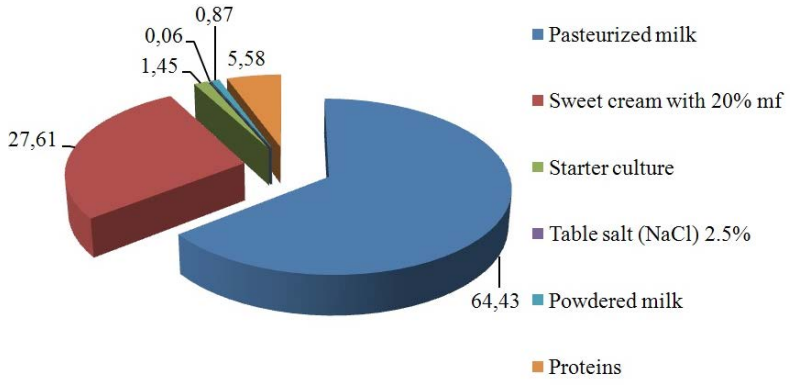
The sour cream is made of skimmed fresh milk. It is rich in fats and is therefore a very high calorie food, but it is still an easily digestible food, which is used in the diet of consumers. The action of lactic acid bacteria that cause milk acidification is also used in sour cream production. Depending on the degree of acidity, it differs: *sweet cream*, which is usually produced with about 24% milk fat and which is collected before acidification begins; *sour cream* (10 to 20% milk fat), which is collected in the advanced acidification phase.

Sour cream production costs

The economic result in sour cream production depends on market prices, on the one hand, and production costs on the other. Dairy producers can influence the costs and cost price of their own products to improve business results. Having this in mind, it is necessary to analyze the amount of costs, their structure and the effect on the production process. Cutting unnecessary costs leads to a lower cost price, which in turn increases the difference between the selling price of own product and its cost price, thus raising the profit. To determine the structure of cost price of processing milk into sour cream with minimum of 20% milk fat in the observed period, the following costs have been analyzed: direct material costs (manifested as the cost of raw materials and packaging), transport costs, labor costs (wages), depreciation costs, and other overhead costs.

The cost of raw material. Basic materials used in sour cream production are raw materials for the manufacturing (milk and other raw materials) and materials used for packaging and labelling. The amount of all raw materials in the manufacture of sour cream is defined in the recipe used by the dairy plant which is observed in this study, and the prices of dairy products are calculated on the basis of their purchase price in 2016 (Table 1). The total cost of raw materials of sour cream with a minimum 20% milk fat amounts to 30.421,60 RSD per 1000 kg. The cost per one kilogram of the product is 30.42 RSD. The share of the cost of raw materials in the total cost of the production of sour cream with a minimum of 20% milk fat is shown in Figure 1.

Figure 1. The share of the cost of raw materials in the total production cost of sour cream



Source: Authors' calculation

As the Figure above demonstrate, the cost of pasteurized milk has the largest share in the total cost of raw materials used for the production of sour cream with a minimum of 20% milk fat, amounting to 64.43%, followed by sweet cream with 27.61%, meaning that milk substantialy contributes to total production costs. In addition to this, components which can influence the price of dairy products are starter cultures, salt, calcium chloride and powdered milk. The share of starter cultures in dairy products is 1.45%.

The amount of milk used varies, depending on the particular dairy product which is manufactured. The production of sour cream requires 0.7 litres of. The change in the cost of raw materials used to manufacture the product will have an impact on the final cost of the product, and therein lies the particularity of the production and costs, because every product consists of a number of components all of which have their market value. As stated earlier, milk is the raw material which makes up the largest share in the structure of any dairy product, and the increase of the market price of milk will lead to the increase of the price of dairy products. Farmgate milk prices for the analyzed period vary from 23.50 to 38.00 RSD. An overview of the prices of milk and dairy product over the three-year period is shown in the following table.

Table 1. An overview of prices of milk and dairy product in the period 2014 – 2016 (RSD)

Year	2014		2015		2016	
Product Name	Product price	Average milk price	Product price	Average milk price	Product price	Average milk price
Sour cream with minimum of 20% milk fat	29,75	27,33	30,07	27,65	30,42	28,00

Source: Authors' calculation

The figures in Table 1 lead to the conclusion that the milk price did not significantly change in the period from 2014 to 2016, and therefore did not cause either an increase or decrease of the final and selling price of given dairy products in those years.

If the average price of milk of 28.00 RSD in 2016 increased by 1 RSD (for 3.57%), with no change in prices of other raw materials, it is possible to determine the impact of the milk price on the production cost of dairy products.

Table 2. The impact of the change of the price of milk as a raw material on the price of sour cream

Name of dairy product	Amount of milk in dairy products (l)	Price of dairy products in 2016. (RSD/kg)	Price of dairy products after the price of milk increased for 3.57% (RSD/kg)	The difference in price after the increase (RSD)
Sour cream with minimum of 20% milk fat	0,7	30,42	31,12	0,7

Source: Authors' calculation

The figures in Table 2 show that every increase of the price of milk leads to an increase of the price of dairy products. In this case, the price of sour cream with a minimum of 20% milk fat increases for 0.7 RSD per kilogram, which is a 2.3% increase. An increase of the price of any other raw material does not lead to a significant increase of the price of dairy products, as the increase of the milk price does, because their share is considerably smaller than that of milk.

The cost of packaging and labelling. The second significant material cost is the cost of packaging. Packaging is a very important object for innovation activities because it has safety, handling, information and sales functions (Špička et al., 2015). Packaging of dairy products develops continuously along with advances in material technologies, which are in turn a response to demands of consumers (Ščetar et al., 2018). The process, method and material for packaging in a dairy is different depending on the product being packaged. Dairies try to use new packages which protect the contents, extend the life of milk products, attract consumers, and make the contents easy to store and transport. In addition, new packages are also environmental-friendly (Špička et al., 2015).

Sour cream comes in packing of 180g and 400kg and it is packaged in cups. In addition to packaging, the cost of labelling has to be taken into account. The cost of one printed label depends on the type of print, paper, size and the like. The declaration for sour cream cups is printed on the cover itself, and the purchase price of one such cover is 0.74 RSD for small cups and 1.25 RSD for large cups. Small cups (180 g) for sour cream are purchased at the price of 1.63 RSD, while for large cups (400 g) this price is 3.65 RSD. In addition, covers are an element of the costs that are included in the final product, i.e. their packaging. Table 3 shows the cost of packaging and labelling.

Table 3. The cost of packaging and labelling of sour cream

Packaging and labelling	Purchase price [RSD]	Share in the total price [%]
Sour cream 180 g 20 % mf		
Cup	1,63	4,79
Cover with declaration	0,74	2,17
Sour cream 400 g 20 % mf		
Cup	3,65	4,86
Cover with declaration	1,25	1,66

Source: Authors' calculation

According to previous Table costs of packaging and labelling have the largest share in the production of 400g cups of cour cream and amount of 4.86%.

Transport costs. When calculating the total cost, transport costs have to be included as one of the elements, and they consist of all activities performed in the transportation process, starting from the place where goods are loaded and ending at the place where goods are unloaded. Transport costs can differ depending on the type of goods, type of transport, quantity of goods, and the final destination. Milk and dairy products can be shipped using own transport or that of the seller or producer, hiring a third party, and using the buyer's transport. The place of delivery can be the buyer's address, a place previously agreed upon, or goods can be collected directly from the dairy plant. Depending on the aforementioned variables, the cost price will vary. If the goods are delivered to the buyer, transport costs increase as the distance increases from the place of loading (dairy plant) to the place of delivery, that is the place of unloading. In the dairy plant which is analyzed in this paper, the calcualtion assumes that the transportation is conducted by the dairy's own transport vehicles of 3.5 tons of payload capacity. In this

dairy, transport costs amount to about 4.06%, or 2.80 RSD per kilogram of produced sour cream, and they mainly depend on the location of the delivery and the cost of fuel, which means that they change with the mileage and quantity. It is fuel that is generally the most important factor influencing transport costs in case of own transport. Costs of vehicle purchase and maintenance are included in depreciation costs. Considering high fuel prices and the distance, transport costs can lead to a considerable increase of the cost of the finished product. Therefore, payload of the vehicle should be utilized to the highest degree to make the production more economical.

Labor costs (wages). Labor costs represent a considerable portion of any company's total costs. While calculating average gross wages and total monthly labor costs, the distinction was made between employees who work in administration and those who work in production, and what their qualifications are, as gross wages of individual workers depend on these factors. Dividing monthly labor costs by montly volume of production gives the share of gross wages in 1 litre or, in this case, 1 kilogram of dairy products over the period of one month. Applying the calculation to a working day gives the same results. In the analyzed period, an average share of gross wages is 37.26 RSD/l or 26.75 RSD/kg of dairy product.

Overhead costs. Manufacturing overhead costs of sour cream constitute about 5.93% of total costs, and they consist of depreciation costs, costs of telecommunications services, power costs, travelling expenses, indirect material costs, legal and contractual obligations, stationery, working equipment for workers and other small material costs. Calculated on the annual level and per kilogram, these costs amount to 4.09 RSD. These costs do not have a direct impact on the final product, but they surely do have an impact on this line of production in the form of overhead costs.

Labor costs and overhead costs are relatively constant and they do not fluctuate considerably. Generally speaking, the high degree of dependence between capacity utilization rate and financial result comes from the existence of fixed costs and their change, both in absolute amount and per unit of product. These costs are also significant in the case of small-scale capacity plants (Zekić et al., 2016).

The structure of cost price of sour cream

Based on the above mentioned production costs, that is the cost of processing milk into sour cream, it is possible to determine the structure and amount of the cost price for the analyzed products, as shown in Table 4.

Table 4. The structure of cost price of sour cream

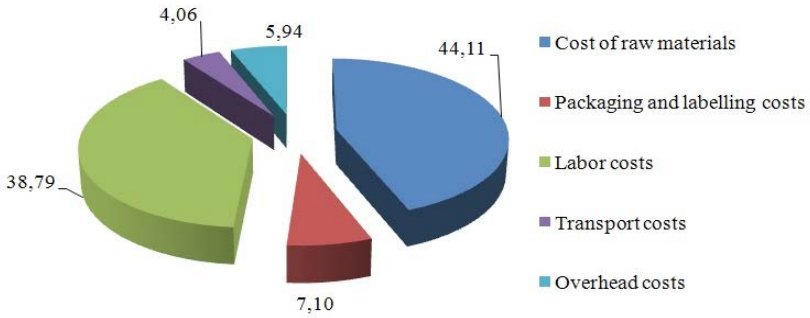
	Costs	Sour cream with minimum of 20% milk fat (RSD/kg)	Share (%)
1	Raw materials	30,42	44,11
2	Transportation	2,80	4,06
3	Packaging	4,90	7,10

	Costs	Sour cream with minimum of 20% milk fat (RSD/kg)	Share (%)
4	Labor costs	26,75	38,79
5	Overhead costs	4,09	5,94
	Total:	**68,96**	**100**

Source: Authors' calculation

As the figures in Table 4 show, production costs of 1 kilogram of sour cream are 68,96 RSD/kg without the VAT. Figure 2 shows the structure of individual costs in total production costs of this milk product.

Figure 2. The structure of individual costs in total costs of sour cream production



Source: Authors' calculation

The costs of raw materials for the production of sour cream have the largest share and amount to 44.11%. This is because raw materials are substances which make up the product, and together with the costs of packaging and labelling constitute the main product. In terms of the amount and significance, the cost of raw materials is followed by labor costs of 38.79%, packaging cost of 7.10%, overhead costs of 5.93% and transport costs of 4.06%. Considering all of this, in order to remain competitive in the market, a small-scale dairy processing plant should pay utmost attention to direct material costs and purchase raw materials at lower prices without sacrificing their quality and ultimately the quality of dairy products.

Conclusions

The production, processing and sale of milk and dairy products is one of the significant segments of the agribusiness sector in Serbia. Dairy processing is dominated by large-scale capacity dairies. The number of small-scale capacity dairies is increasing in the

market, with about 20% of the total milk processing in Serbia. If small-scale capacity dairies fail to achieve qualitative and cost competitiveness, meet consumer needs, meet quality standards, increase exports to European Union countries and beyond, the expansion of production capacity, reduced numbers of smaller dairies and their vertical integration can be expected. In order for small-scale capacity dairies to compete with larger-scale capacity dairies, both in product quality and price, it is necessary to continuously monitor and minimize production costs. In addition to cheese, which is considered to be the most promising dairy product in terms of production and export, other dairy products, which could improve the economic position of dairies of all capacities, should also be pay attention.

The study has revealed that cost price of sour cream with a minimum of 20% milk fat in a small-scale dairy processor amounts to 68.96 RSD/kg. As the results show, processing milk into sour cream is justifiable, when compared with the sales of raw milk. Thereby, care should be taken of the cost structure that determines the cost of the final product and how to reduce these costs without compromising the quality of the product itself. With 44.11% in the structure of total costs of processing milk into sour cream, the cost of raw materials has the largest share because they are substances which final products are made of. The component which has a significant impact on the price of the dairy product is the price of milk, while an increase of prices of other raw materials does not have as significant an impact on the price of dairy products as raw milk does, because they have a much smaller share in total costs. In the total costs, labor costs involve 38.79%, which is the second highest cost after raw materials. The level of these costs directly depends on the number of employees, working hours and wages as well as the volume of monthly production. The primary principle of reduction of these costs is to purchase modern machinery and equipment, which minimizes the number of employees. The costs of packaging and labelling are designated as direct material costs and they participate with 7.10% in the cost price of sour cream with a minimum of 20% milk fat. The level of these costs chiefly depends on the type and quantity of materials used for packaging. Transport costs participate with 4.06%, or 2.80 RSD/kg of sour cream. Payload of the vehicle should be utilized to the highest degree to make the production more economical. Manufacturing overhead costs of sour cream constitute 5.94% of total costs.

In order for small-scale dairy processors to become as competitive as large-scale ones in contemporary market conditions, they should pay utmost attention to direct material costs and purchase raw materials at lower prices without sacrificing their quality and ultimately the quality of dairy products.

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Conflict of interests

The authors declare no conflict of interest.

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THE OPERATIVE PROFIT MARGIN AND INTEREST COST IN RETAIL FOOD

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ABSTRACT

Under the influence of different factors, the dynamics of the size of the operating profit margin of food trading companies in Serbia varies from comparable global food retailers in various countries. Based on the obtained results of empirical research, we can also conclude that the operating profit margin of the leading food trading companies in Serbia is lower than the in analyzed comparable food retail trade companies from the developed market economies. It points to the conclusion that it is necessary to efficiently manage revenues, costs, profit, assets, and financial structure in order to improve the performance of food trading companies in Serbia in the future. In order to increase the operating profit margin, as a measure of long-term performance, it is necessary to manage the financial structure of the food trading companies in Serbia as effectively as possible. The main objective of this paper is to apply dynamics of size and structure of operating margin of global retailers in Serbia by applying accounting methodology based on data from annual financial statements. It is an increasingly significant non-standard indicator of their performance. Therefore, this indicator will receive increasing attention in the future.

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Introduction

Considerable theoretical and practical attention has been paid in recent years to analyzing the operating profit margin or earnings before interest, taxes, depreciation and amortization (EBITDA margin) as a measure of the long-term performance of companies. On the basis of it, special indicators of long-term performance of companies have been developed. They are comparatively analyzed by individual companies (from the same and different sectors) and based on this –their long-term business success is recognized. Bearing this in mind, the subject of research in this paper is a comparative analysis of the operational profit margin of food retail enterprises in Serbia and comparable foreign retailers.

The aim of this research is to thoroughly investigate the problems of the operating profit margin as one of the determinants of the long-term performance of food trading companies in Serbia and, on that basis, to propose the measures for its improvement in the future. This gap is to a certain extent filled with this paper, in what we find its scientific and professional contribution.

The basic hypothesis of research in this paper is that the operating profit margin is a significant measure and determinant of the long-term performance of food trading companies. For these reasons it is necessary to investigate it more extensively on the example of food trade companies in Serbia, particularly the dynamics and factors of its size.

In this paper, we will explore the dynamics of the size of EBITDA margin of well-known global food retailers, such as Wal-Mart, Tesco and Ahold Delhaize, in order to make comparisons of the EBITDA margin with Serbian trading companies. This provides the basis for proposing adequate measures to increase the size of the EBITDA margin, as a measure of long-term performance of food trading companies in Serbia. The EBITDA margin of the analyzed leading food trading companies in Serbia (Ahold Delhaize Serbia, Mercator-S and IDEA) is lower than that of analyzed comparable food retail companies from the developed market economies.

Overall, more efficient management of the financial structure of capital, sales revenues, costs of goods sold (including operating costs, interest) and profit can significantly influence the increase in the EBITDA margin as a measure of the long-term performance of food trading companies in Serbia. This will definitely have a positive impact on the dynamics of the size and efficiency of investments, as a key factor in the performance of food trade companies in Serbia.

Interest costs are a component of operational costs of trading companies (Popović, 2018). They are covered from the margin. Their size varies depending on the interest rate, foreign exchange rate, investment management efficiency, financial indebtedness, sales and other controlled and uncontrolled determinants (Tao, 2019; Kenchington, 2019; Lambrinoudakis, 2019; Shamshur, 2019; Ye, 2019). This paper examines the dynamics and factors of the size of the costs of interest rates of food retail companies in Serbia for the period 2014 – 2017. The empirical results of the research show a con-

tinuous reduction of the interest costs in the last years of the analyzed period. This had a positive effect on the performance of retail companies in Serbia.

Materials and methods

For the needs of the research of the treated problems in this paper, empirical data from the Agency for Business Registers of the Republic of Serbia were used. They are completely comparable to the same type of other global food retailers 'data and, in this sense, there are almost no restrictions on the obtained research results in this paper due to the fact that we used empirical data from their publicly disclosed financial statements in this study. With the defined aim and research hypothesis, the basic methodology in this paper is the comparative analysis and application of the relevant statistical analysis. Also, to a certain extent, the historical and normative methodology was applied in researching the treated problem in this paper. The operating profit margin or earnings before interest, taxes, depreciation and amortization (EBITDA margin) as a measure of performance has been used since the mid-1980s, especially since the 1990s in all companies, including wholesale and retail (Lukic, 11; Levy, 2019; Lekić et al., 2018; Lukić et al., 2018).

There is extensive literature written on the subject of general problem of measuring the significance of gross operating margin in financial reporting for the needs of more efficient company management (Sui, 2017). However, a number of published papers dedicated to the specificities of gross operating margin analysis in commercial enterprises (food retailers) is significantly lower (Berman, 2018; Levy, 2019; Corona, 2014; Špička, 2016; Tan, 2016; Calva, 2017; Carstea et al, 2017; Ko et al., 2017; Hoe, 2017; Manini, 2017). This particularly applies to literature in Serbia (Lukic, 2017a, b; 2018) – as far as we know, there is no complete work that has been published so far on the issue of the importance of measuring and analyzing gross operational margin in Serbia's trade companies (food retailers).

As a measure of long-term performance of (food) retailers, the operating profit margin has its advantages and disadvantages. It is considered that during the usage of this criterion retailers are focused on the performance of fundamental business rather than on financial decision-making related to depreciation of fixed assets, interest and financial structure (lending instead of increasing equity by selling shares) (Levy, 2019). In view of this, it provides bankers, investors, creditors, fiscal authorities and others an insight into the long-term potential options for collecting their retailers' claims.

More and more financial analysts are aware of certain problems of interpreting the EBITDA margin, and in order to overcome them, the model of economic additional value (the so-called EVA model) is recommended. Nevertheless, it should also be noted that the very model of economic value addition has its own weaknesses, which primarily relate to subjective assumptions regarding the calculation of capital costs. In conclusion, it is necessary to use both models (EBITDA margin, EVA model) concurrently when assessing the long-term performance of retailers.

We are well aware of the fact that in recent years many global retailers, and what we consider quite right, also regularly report on the economic value added (for example, METRO group and others) in the context of integrated financial reporting. In this way, the problem of interpreting the EBITDA margin is partially mitigated. Due to the specifics of the nature itself, way of doing business and the applied financial management strategy, the dynamics of the size of the operating profit margin varies by individual types of trade (wholesale and retail), retail companies and countries in which they operate, retail chains (types of shops) and product categories. This is scientifically proven by the empirical analysis of EBITDA-size dynamics of retailers 'margin which has been carried out from different perspectives.

Model of calculating the EBITDA margin, it is determined in the following way:

EBITDA = Revenue - Expenses (excluding interest, taxes, depreciation and amortization),

i.e.

EBITDA = Net profit + Interest + Tax + Depreciation + Amortization.

From this last formula it follows that:

Net profit = EBITDA - (Interest + Tax + Depreciation + Amortization).

For illustration purposes *Table 1* shows the model for calculating the EBITDA margin in the global retailer Wal-Mart. Therefore, it is consistent with the model shown above.

Table 1. Model of calculating the EBITDA margin at Wal-Mart (USD $ million)

	January 31, 2018	**January 31, 2017**
Net income	9,862	13,643
Add: Net income attributable to non-controlling interest	661	650
Less: Income from discontinued operations, net of income tax	-	-
Add: Income tax expense	4,600	6,204
Earnings before tax (EBT)	15,123	20,497
Add: Interest expense, debt, capital lease and financing obligations	2,330	2,367
Earnings before interest and tax (EBIT)	17,453	22,864
Add: Depreciation and amortization	10,529	10,080
Earnings before interest, tax, depreciation and amortization(EBITDA)	27,982	32,944

Source: Retrieved from https: // www.stock-analysis-on.net (July 10,2018)

Results and discussion

The value multiplier is determined as follows:

Enterprise Value / EBITDA = (Market Value of Equity + Value of Debt-Cash) / EBITDA.

It shows how the market values the (retail) firm in accordance with the ability to generate operational profits (Enterprise value/EBITDA (EV/EBITDA). As an illustration, *Table 2* shows a value multiplier on the example of a food value chain in the US.

Table 2. Food value chain value multiplier in US, January 5, 2018

	EV/EBITDA
Farm/Agriculture	13.07
Food processing	13.01
Food wholesale	10.43
Retail (grocery and food)	8.40
Restaurant/Dining	12.69

Source: Enterprise Value Multiples by Sector (US), January 5, 2018, Retrieved from ,http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/vebitda.html (July 10, 2018)

Note: Enterprise Value / EBITDA = (Market Value of Equity + Value of Debt-Cash) / EBITDA.

The data in a given table show that the value multiplier is different for some members of the food value chain in the US. Thus, for example, it is significantly higher for farming/agriculture (13.07) than for retail (8.49). This is partly due to differences in the very nature of their business. In order to make in-depth analysis of the EBITDA margins in the food retail sector, *Table 3* shows a value multiplier of the Wal-Mart retailer and its competitors for 2017 and 2018.

Table 3. Value multiplier,Wal-Mart (January 31, 2017 and 2018)

Wal-Mart Inc., EV / EBITDA calculation	**January 31, 2018**	**January 31, 2017**	**January 31, 2016**	**January 31, 2015**	**January 31, 2014**	**January 31, 2013**
Enterprise value (EV), (USD $ million)	305,207	260,427	260,724	306,165	300,184	297,926
Earnings before interest, tax, depreciation and amortization (EBITDA), (USD $ million)	27,982	32,944	33,640	36,433	35,861	36,489
Ratio EV / EBITDA	10.91	7.91	7.75	8.40	8.37	8.16
Benchmarking EV / EBITDA competition						
Amazon.com Inc.	-	43.74	31.40	33.08	33.45	41.58
Costco Wholesale Corp.	-	12.63	13.27	13.49	12.08	12.30
eBay Inc.	-	14.50	8.04	8.92	12.34	12.88
Home Depot Inc.	13.46	12.90	13.23	12.90	11.11	11.74
Lowe's Cos.Inc.	11.24	11.43	12.18	12.79	10.47	9.60

Wal-Mart Inc., EV / EBITDA calculation	January 31, 2018	January 31, 2017	January 31, 2016	January 31, 2015	January 31, 2014	January 31, 2013
Netflix Inc.	-	18.03	11.80	10.59	8.22	9.62
Target Corp.	6.96	5.59	7.47	9.21	7.85	8.09
TJX Cos.Inc.	-	11.16	11.83	11.14	10.70	9.10
EV / EBITDA, Sector						
General retailers	-	15.92	12.72	12.34	10.93	10.95
EV / EBITDA, Industry						
Customer service	-	12.26	11.49	10.91	10.77	10.30

Source: Retrieved from https: // www.stock-analysis-on.net (July 28, 2018)

The data in the given table show that the value multiplier differs between some food retailers. Thus, for example, on January 31, 2018, in Target Corp. it was 6.96 and in Wal-Mart 10.91, respectively. The Wal-Mart value multiplier is lower than the average of the sector and industry. These differences are certainly the result of the implementation of different financial management strategies (lending versus the increase in equity by selling shares). Earnings before interest, taxes, depreciation and amortization differ among individual food retail companies. *Table 4* illustrates the dynamics of the EBITDA margin of the global retailer Wal-Mart for the period 2008 - 2017.

Table 4. Dynamics of EBITDA margin of Wal-Mart, 2008 – 2017

End of period	WMT
January 2008	NA
January 2009	7.3%
January 2010	7.6%
January 2011	7.9%
January 2012	7.7%
January 2013	7.7%
January 2014	7.5%
January 2015	7.5%
January 2016	7.0%
October 2016	6.8%
January 2017	6.8%
October 2017	6.6%

Source: Retrieved from https://finbox.io/WMT/explorer/ebitda_margin (July 10,2018)

Recently, the EBITDA margin has decreased in Wal-Mart compared to the previous period. Compared to some competitors it is larger and compared to others – smaller (for example, Target Corporation 9.9%) (*Table 5*). This is, partly, the result of the very nature of the industry operations of its own, sector, company size and business operations model (i.e. the applied financial strategy of the business).

Table 5. EBITDA margin of Wal-Mart and its competitors, 2017

Company	EBITDA margin
Spartan Nash Company (SPTN)	-0.3%
Smart & Final Stores, Inc. (SFS)	3.1%
Kroger Company (The) (KR)	4.5%
CompanhiaBrasileira de Distribuicao (CBD)	6.1%
Casey's General Stores, Inc. (CASY)	6.2%
Best Buy Co., Inc. (BBY)	6.2%
CVS Health Corporation (CVS)	6.6%
Wal-Mart Stores, Inc. (WMT)	6.6%
Target Corporation (TGT)	9.9%
Consumer Staples (SECTOR:STPL)	12.5%
Procter & Gamble Company (The) (PG)	25.6%
#ERROR! (CNCO)	NA

Source: Retrieved from https://finbox.io/WMT/explorer/ebitda_margin (July 11, 2018)

Table 6 shows the dynamics of EBITDA margin of Tesco for the period 2014 - 2018.

Table 6. EBITDA margin of Tesco, 2014 – 2018

Fiscal year March-February. All values are expressed in millions of pounds (GBP)	2018	2017	2016	2015	2014
Sales/Revenue	57,491	55,917	53,933	56,925	63,557
EBITDA	2,957	2,581	2,202	(1,733)	4,757
EBITDA growth	14.57%	17.21%	227.06%	-136.43%	-
EBITDA margin	5.14%	-	-	-	-
EBIT	1.663	1.284	-	-	3.225

Source: Retrieved from https://quotes.wsj.com/UK/XLON/TSCO/financials/annual/income-statement (July 11, 2018)

The data in the given table show that the share of EBITDA margin in revenues is lower in Tesco (5.14%) than in Wal-Mart (6.6%). This is partly a consequence of a different model of doing financial operations. *Table 7* shows the EBITDA margin of Ahold Delhaize, which operates in Serbia as Delhaize Serbia.

Table 7. EBITDA margin of Ahold Delhaize

	12/16A	12/17E	12/18E	12/19E
Revenue (€ million)	63,093	63,943	65,348	66,920
EBITDA (€ million)	4,142	4,267	4,507	4,836
EBIT (€ million)	2,420	2,386	2,638	2,923
EBIT growth (%)	7.9	(1.4)	10.6	10.8
EBITDA margin (%)	6.6	6.7	6.9	7.2
EBIT margin (%)	3.8	3.7	4.0	4.4
EV/EBITDA (x)	6.7	6.4	6.0	5.5
EV/EBIT (x)	11.4	11.4	10.3	9.2

Source: Retrieved from https://research-doc.credit-suisse.com/docView?language=ENG&format=PDF&sourceid=emgpm&document_id=1077229781&serialid=7%2F%2FS9ldDW4ewIdMX6A26zlMtYs6VxLxiTmpgD2zQdGM%3D (July 22, 2018)

In Ahold Delhaize, the EBITDA margin is higher than at Tesco (5.14%) and is approximately the same as with Wal-Mart (6.6%). In the future, there is an estimated growing trend. The EBITDA margin is certainly different among observed countries in which Ahold Delhaize operates. Ahold Delhaize's operating profit margin, observed by individual countries in which it operates, is significantly higher in the US and the Netherlands than in Belgium and Central and Southeastern Europe (to which the Delhaize Serbia belongs). These differences are the result of different general business conditions and applied (financial) business strategies. *Table 8* shows the EBITDA margin of the Russian company X5 Retail Group for the period 2012-2016.

Table 8. Dynamics of EBITDA margin of the company X5 Retail Group, 2012-2016

	EBITDA Margin (Rub bn)	EBITDA margin, %
2012	35,1	7.1%
2013	38,4	7.2%
2014	46,4	7.3%
2015	59,4	7.3%
2016	79,5	7.7%
2016/2015	33.8%	

Source: Q1 2017 Financial Results, X5 Retail Group, Moscow, Russian Federation 27 March 2017, Retrieved from https://www.x5.ru/en/Documents/X5-Q1-2017-Financial-results.pdf (July 12, 2018)

The data in the given table clearly show that the EBITDA margin of the company X5 Retail Group is higher than in Wal-Mart, Tesco and Ahold Delhaize. In other words, its profitability measured by cash flows from operations (using EBITDA margin) is slightly better than the observed retail companies.

In order to make anin-depth analysis of long-term trade performance in Serbia measured by the EBITDA margin, we will show the respective margin for three significant (food retail) trade companies in Serbia for 2016 (*Table 9*). Based on the data presented in the given table, we can also conclude that the EBITDA margin of the leading (food) trading companies in Serbia is lower than the analyzed comparable (food retail) trade companies from the developed market economies.

Table 9. EBITDA margin of significant trade companies in Serbia, 2016

	EBITDA margin, (million dinars)	EBITDA margin, (% from sales)
Ahold Delhaize Serbia	3,719	4.3%
Mercator-S	3,081	2.9%
IDEA	117	3.99%

Source: Author's calculation based on data of Business Registers Agency, Belgrade.

In order to make a more complex analysis of the issues discussed in this paper, we will look at the dynamics of interest costs of Delhaize Serbia and Mercator-S. These two companies are the most important retailers in Serbia (according to the realized business revenues in 2017). *Table 10* shows the dynamics of interest costs of Delhaize

Serbia and Mercator-S, and some global retail chains for the purpose of international comparisons.

Table 10. Interest costs of selected retailers in Serbia

	Delhaize Serbia					Mercator-S				
	Revenues (million dinars)	Interest cost (million dinars)	Interest costs (% of revenues)*	Interest revenues (million dinars)	Net interest costs (million dinars)	Revenues (million dinars)	Interest costs (million dinars)	Interest costs (% revenues)*	Interest revenues (million dinars)	Net interest costs (million dinars)
2014	74,943	13	0.02	179	166	72,554	555	0.76	68	487
2015	77,383	11	0.01	239	228	112,229	975	0.87	83	892
2016	85,025	1	0.00	215	214	100,042	1.247	1.24	64	1,183
2017	94,884	1	0.00	410	409	90,747	1.314	1.45	12	1,302
Global retailers			Interest costs (% from revenues), 2017							
Wal-Mart Q4 2017			0.47							
Target Q4 2017			0.92							
Kroger Co. Q4 2017			0.49							
Tesco			1.56							
Carrefour			0.40							
Ahold Delhaize			0.46							
X5 Retail Group			1.16							

Source: Business Registers Agency of the Republic of Serbia, CSIMarket, Retrieved from https://csimarket.com/ (December 14, 2018), and Annual Report Tesco 2017, Annual Report Carrefour 2017, Annual Report Ahold Delhaize 2017, X5 Retail Group Annual Report 2017, Retrieved from https://ar2017.x5.ru/en (December 24, 2018)

Note: *Calculation performed by the author(s)

The data in the given table show that the interest costs in Delhaize Serbia decreased in the observed period, and increased with Mercator-S from year to year. In 2017, interest costs in percentages of revenues are higher in the company Mercator-S, and lower in Delhaize Serbia in comparison to the observed global retail chains (Wal-Mart, Target, Kroger Co.).

Table 11 shows the interest coverage ratio of selected retailers in Serbia in 2017.

Table 11. Interest coverage ratio of selected retailers in Serbia, 2017

	Net profit (million dinars)	Interest (million dinars)	Tax (million dinars)	Earnings before interest and tax (EBIT) (million dinars)*	Interest coverage ratio (Earnings before interest and tax / Interest)*
Delhaize Serbia	4,264	1	237	4,502	4.502
Mercator-S	(6,851)	1,314	144	(5,393)	(4.10)
Global retailers					
Wal-Mart					9.08
Target					13.74
Kroger Co.					10.99
X5 Retail Group					3.77

Source: Business Registers Agency of the Republic of Serbia, CSIMarket, Retrieved from https://csimarket.com/ (December 14, 2018) and X5 Retail Group Annual Report 2017, Retrieved from https://ar2017.x5.ru/en (December 24, 2018)

Note: *Calculation performed by the author(s)

The data in the given table show that the interest coverage ratio of selected retailers in Serbia is lower compared to the observed global retailers. This is, among other things, the result of more unfavorable general conditions of business in Serbia. In addition to the unfavorable financial structure, we need to add that there is also a lower level of implementation of modern concepts of business as well as modern technology in the retail market of Serbia.

More recently, in addition to the standard indicators, non-standard performance indicators such as operating margin (EBITDA) have been increasingly analyzed in all companies. In this way, as the results of the research in this paper on the example of global food retailers and in Serbia show, the financial performance is realized.

Due to the importance of food retailers, therefore, in the future, they should pay increasing attention to the operating margin indicator in order to improve the efficiency of financial performance management. This is especially true for food retailers in Serbia. Overall, it is recommended that food retailers in Serbia increasingly measure their performance using the operating maze indicator as presented in this paper.

Conclusions

For trade companies in Serbia, there is a tendency of reducing interest costs. This was influenced by numerous factors, among other things, by reducing the banking interest rate, a stable exchange rate and improving general business conditions.

According to the realized business income in 2017 in Serbia, the two most important retailers are Delhaize Serbia and Mercator-S. The general conclusion is that their interest coverage ratio is lower than with the global retailers such as Wal-Mart, Target and Kroger Co. This is due to the fact that there are unfavorable structures of the capital of the observed retailers in Serbia.

The EBITDA margin of the analyzed leading trading companies in Serbia (Ahold Delhaize Serbia, Mercator-S and IDEA) is lower than that of analyzed comparable retail (primarily food) trade companies from the developed market economies. Overall, more efficient management of the financial structure of capital, sales revenues, costs of goods sold (including operating costs, interest) and profit can significantly influence the increase in the EBITDA margin as a measure of the long-term performance of trading companies in Serbia. This will definitely have a positive impact on the dynamics of the size and efficiency of investments, as a key factor in the performance of trade companies in Serbia.

There is a tendency of increasing interest coverage ratio in trading companies in Serbia. It is slightly higher than a defined comparable industry standard. In view of this, the solvency of trading companies in Serbia is increasing.

Conflict of interests

The authors declare no conflict of interest.

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CORRELATION OF THE LEVEL OF SALARIES OF EMPLOYEES IN MEDIUM-SIZED AGRICULTURAL ENTERPRISES AND INDIVIDUAL FARMS AND THE IMPACT ON TOP MANAGEMENT

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ABSTRACT

Businesses of an enterprise can be improved in various ways. One of the important influences on the business of agricultural enterprises is maintaining the level of salaries of employees at a competitive level. This was adopted by the authors and a survey was conducted which covered medium-sized agricultural enterprises and individual farms with respect to the level of earnings in the period 2017-2019 in the Republic of Serbia. The results indicate that there is a statistically significant relationship between the level of salaries of employees in both forms of organization of agricultural production and the profit of the enterprise. In addition, there is a significant correlation between the level of employees' salaries and positive profits for 2017 alone ($p < .05$), while there is no significant relationship for the remaining two years. Finally, the final conclusion porous from this study suggests that there was an increase in employee pay in 2019 with a simultaneous fall in income.

Introduction

Contemporary management requires the adoption of valid business decisions by the top management or the company's owner. These are general postulates that must be followed by anyone, especially those who decide. Numerous authors highlight various factors that can affect business results, such as those that emphasize the importance of realistic appreciation of anything that can influence management enhancement (Anwar

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& Sun, 2015, Boukalova et al., 2016, Bozzolan et al., 2016, Bratten at al., 2016; Dax & Oedl-Wieser 2016; Funnell et al., 2016).

This changes structurally the socio-economic conditions of business in the broadest sense (Popović, 2014), which must take into account top management in any branch of business.

Governance issues come to the fore especially in activities that have a smaller turnover of capital over the course of the year, especially in agriculture that has a small turnover ratio during the year. Each change in the conditions in the mentioned activities creates enormous difficulties in decision-making processes, which are pointed out by numerous authors (Brousseau et al., 2014; Durocher & Gendron, 2014; Catuogno et al., 2016; Florou et al., 2016; Lee, 2019).

Management in agricultural activity must be considered with a particular degree of attention, in which many authors point out in their work (Popović at al., 2015, Kuo et al., 2018, Popović et al., 2018, Novaković et al., 2018). In addition to them and other authors, they emphasize the importance of observing agricultural activity in the broadest context of observation, that is, in the context of global level observations, which are influenced by very heterogeneous factors (Nowak et al., 2016, Wang, 2019, Kijek et al., 2019, Gaetano & Lamonaca 2019; Balikçioğlu & Yilmaz 2019).

Management and specific management are of particular importance in the conditions governing agricultural production, where essentially all factors of production come to terms such as land, machinery, labor (Terzić et al., 2019: Bojović at al., 2019). Thus, the comprehensive observation of agricultural production also includes other factors indirectly indicated by authors (Bratkovič-Kregar et al., 2019, Park et al., 2019, Gatarik 2019) in their works.

The issues of labor force evaluation can be seen from multiple levels. One way is to observe from the local level or the region of the state, which they indirectly point out (Kukovič et al., 2016, Scalera, 2016, Alibegović et al., 2018, Rodriguez et al., 2019;) Chengzhi & Hao 2019), but also in the context of the framework, for example in the framework public sector of business (Taylor, 2010; Wang, 2016; Naumescu, 2018) or gender and migrants (Mihăilă et al., 2018).

The relationship between evaluation and management is emphasized in numerous papers by the author, with a note of a close relationship with standardization (Cheng, 2016; Tackie et al., 2016; Popović et al., 2017), which must be taken into account when managing the companies (Kouřilová & Sedláček, 2014; Ege, 2015; Oakes & Oakes 2015; Catuogno at al., 2016). Essential reporting of management must be comprehensive (Oliveras & Puig 2005; Williams, 2010; Topac & Serap 2017), as this is one of the key prerequisites for making business decisions properly.

The authors took into account the views expressed by the authors in the aforementioned papers and outlined the following objectives for the study. The main objective of the author was to show to the expert public the importance of monitoring the level

of salaries of employees in the broadest form of organizing agricultural production in the Republic of Serbia. The second objective of the author, namely the basic goal, was to determine the movement of employees' wages and profit generation in both forms of agricultural production organization.

Starting from the set goals, the authors made a comparative analysis in order to show the possible differences between the operations of medium-sized agricultural enterprises and individual farms in terms of changes in the level of salaries of employees and profit.

The basic assumption of the author was that there is no difference in the movement of the level of salaries of employees in the analyzed two forms of organization of agricultural enterprises. The authors' focus was on looking at the salaries of employees in the first quarter of the research period. The authors then processed the survey data from the questionnaire. The author's stated goal at this stage of the research was to discover a possible difference between the amounts of earnings of employees in the mentioned forms of agricultural production organization. In the following, the authors wanted to find out, by way of comparison, the trends in the level of earnings of employees in relation to the realized profit.

Bearing in mind their conceptual framework, the characteristics of medium-sized agricultural enterprises and individual farms in terms of the level of wages for the previously defined period and the expected effects based on the available literature, the previously published works on this topic and the intuitive expectations of the authors are formulated in 5 hypotheses.

Hypothesis 1 (H1): There is no change in wage levels for medium-sized enterprises by years for the research period 2017-2019.

Hypothesis 2 (H2): There is no change in the amount of wages in individual farms per year for the research period 2017-2019.

Hypothesis 3 (H3): There is no change in the level of wages between the two observed groups (medium-sized enterprises and individual farms) by age for the research period 2017-2019.

Hypothesis 4 (H4): There is no change in the profit margin of the two observed groups (medium-sized enterprises and individual farms) by age for the research period 2017-2019.

Hypothesis 5 (H5): There is no correlation between the level of wages on the business results achieved by years for both previously defined forms of organization of agricultural production observed for the whole period in which the survey was conducted (2017-2019).

Material and methods used

To make this work, the authors used a three-year research period in two forms of organization of agricultural production, that is, in farms of individual producers and medium-sized agricultural enterprises.

The subject of the research was the movement of the amount of wages of workers employed by subjects in two forms of organization that were mentioned by the authors. Medium-sized agricultural enterprises included surveying in 100 entities, and individual farm farms were surveyed with 103 subjects in all three years of observation.

Accordingly, the same number of subjects in the three-year period surveyed by the authors of this paper was surveyed. The observation period ranged from 2017-2019 to the first quarter of the years in question.

Subsequently, the authors deepened the research by performing comparisons for each year within the surveyed subjects with the results achieved in entities in the form of profits that they achieved in the first quarter of the year.

In order to prepare this paper, the authors used the survey because they wanted to obtain reliable information using the research method, through which they could issue valid conclusions on the changes in the wages amount (2017-2019) in the Republic of Serbia in two forms of organization of agricultural production.

Namely, medium-sized agricultural enterprises and individual farms of individual producers were analyzed regarding the movement of wages. By using the questionnaire, the authors came up with valid information regarding the amount of wages in the year of observation, all in the first quarter of the year in question. The aim of the research was to obtain reliable information on the movement of wages levels throughout the observation period (2017-2019).

The results presented in this paper are based on the data processing of 203 surveyed legal entities that operate predominantly in the field of agriculture in the Republic of Serbia. 100 medium-sized agricultural enterprises and 103 farms of individual agricultural producers were surveyed. The information obtained through the survey is approximately the same by the number of surveys for both groups of agricultural production organizations.

The statistical software program SPSS IBM was used for data processing. As an initial insight into the data, descriptive statistics were made, more precisely the arithmetic meanings and standard deviations of the used variables in the sample were calculated, and then the absence of extreme values and the missing data were determined.

Subsequently, in order to gain further insight into the relations of the used indicators, the analysis of the intergroup gap testing (t-test for independent and dependent samples) was performed in order to gain insight into the changes in the displayed pairs of variables.

For the purposes of the last hypothesis, the authors carried out a correlation analysis (Pirson's correlation coefficient) in order to monitor the correlation between the tested variables.

Results

After the introduction of the preliminary reviews, the authors presented the results of the research for the research period 2017-2019. To this end, in order to qualitatively explain the H: 1, which essentially points out the absence of wage changes in medium-sized agricultural enterprises by prior years, H. 2 explained that there was a postulation that there was no change in the amount of wages in individual farms according to the selected For the years in which the survey was conducted, the authors obtained results obtained in Table 1.

Table 1. Values of t-test analysis for medium-sized enterprises and individual farms in relation to the amount of wages

		Mean	t	df	Sig.
Medium-sized agricultural enterprises	Wages 2017-Wages 2018	-486.83838	-136.492	98	.000
	Wages 2017-Wages 2018	-1764.55556	-509.308	98	.000
	Wages 2017-Wages 2018	-1277.71717	-299.141	98	.000
Individual farms	Wages 2017-Wages 2018	-475.14563	-108.458	102	.000
	Wages 2017-Wages 2018	-1766.97087	-288.789	102	.000
	Wages 2017-Wages 2018	-1291.82524	-154.633	102	.000

Source: authors' calculation

The results of the research based on the H: 3 setting, i.e. that there is no change in the level of wages between the two observed groups (medium-sized agricultural enterprises and individual farms) by years of research in the period 2017-2019, the authors presented in Table 2.

Table 2. Values of t-test analysis for medium-sized enterprises and individual farms in the amount of wages

	t	df	Sig. (2-tailed)
Wages 2017	-.156	200	.876
Wages 2018	2.196	185.886	.029
Wages 2019	-.442	200	.659

Source: authors' calculation

In the continuation of the paper, in order to show the results based on the H: 4 setting, i.e. that there is no change in the amount of profit between the two observed groups (medium-sized agricultural enterprises and individual farms) by the selected years of research in the period 2017-2019, the authors presented the results in Table 3, by displaying the value of the t-test assay.

Table 3. Values of t-test analysis for medium-sized enterprises and individual farms at the level of profit

Profit 2017	-2.141	104.110	.035
Profit 2018	-2.643	101.834	.010
Profit 2019	3.885	191.922	.000

Source: authors' calculation

In the end, the authors are in need of H: 5, that is, there is no connection between the movements of the amount of wages to the achieved business results by the selected years of research (2017-2019) for both observed forms of organization of agricultural production presented the results obtained through Table 4.

Table 4. The values of Pirson's correlations between the amount of wages and realized profits in two types of enterprises

		Profit 2017	Profit 2018	Profit 2019
Wages 2017	Pearson Correlation	.240**	.322**	-.153*
	Sig. (2-tailed)	.001	.000	.029
Wages 2018	Pearson Correlation	.104	-.030	-.067
	Sig. (2-tailed)	.139	.675	.347
Wages 2019	Pearson Correlation	-.026	-.034	-.039
	Sig. (2-tailed)	.716	.633	.583

Source: authors' calculation

Discussion

The results presented can serve as a basis for obtaining a comprehensive picture when it comes to changing the level of wages in agricultural medium-sized enterprises and individual farms in the period 2017-2019 in the Republic of Serbia.

Based on the values of t-test (Table 1.) for dependent samples, H1 and H2 hypotheses are rejected, as it has been confirmed that there is a significant change in the amount of wages per year, both in medium-sized enterprises and in individual farms (at p = , absolute reliability).

Wages in 2017 are significantly lower than those in the next two years (for both types of enterprises). Also, the wage in 2018 is lower in both types of enterprises than in 2019.

Based on the results obtained in Table 2, i.e. the presentation of the obtained values of the t-test, which was done by the radial analysis of agricultural medium-sized enterprises and individual farms regarding the level of wages, the authors point out that the hypothesis H: 3 is partly rejected.

This is confirmed, based on the value of the t-test for independent samples (Table 2), i.e. there is a difference in the level of wages in 2018 between medium-sized agricultural enterprises and individual farms (medium-sized enterprises have higher wages).

For the years 2017 and 2019, there is no change in the amount of wages between these two types of enterprises.

Based on the value of the t-test for independent samples (Table 3), the H4 hypothesis is completely rejected, as it has been confirmed that there is a significant difference between the profit in all three years examined between medium-sized aquaculture enterprises and individual farms.

In 2017 and 2018, higher profits were achieved on individual farms than in medium-sized enterprises, while in 2019 the situation was reversed.

At the end of the research, the authors point out that, based on the obtained results of the study of hypothesis 5, it is partially accepted because it is confirmed that the statistically significant association (Table 4) between the wage height and the realized profit is in the positive direction only for 2017 (at the level $p < .05$), while for the remaining two years there is no significant connection. In other words, the increase in wages in 2018 and 2019 did not significantly affect the realized profit, either in a positive or negative direction.

It is noteworthy that in 2019, even though not statistically significant, the relationship changed direction, and the increase in wages led to a decline in profit. This is a potentially significant trend, which requires further monitoring.

Conclusion

The results presented can serve as a basis for obtaining a comprehensive picture of the level of wages in agricultural medium-sized enterprises and individual farms in the period 2017-2019 in the Republic of Serbia. In the three-year research in the period 2017-2019, the authors analyzed 203 subjects. In the survey, they identified for medium-sized agricultural enterprises (100) and approximately the same number (103) of individual farms. Based on the results shown, the following seven conclusions can be drawn regarding the movement of wages in the most vulnerable part of active agriculture.

First, in the period 2017-2019, there is a significant change in the level of wages in the Republic of Serbia, both in medium-sized enterprises and in individual farms ($p = .000$).

The second conclusion stemming from the study is that wages in 2017 are significantly lower than those in 2018 and 2019, both for the analyzed type of organization of agricultural activity.

Third, wages in 2018 are lower in both types of agricultural activity than in 2019.

Fourthly, based on the presentation of the results obtained in Table 2, i.e. the presentation of the obtained t-test values, the authors point out that there is a difference in the level of wages in 2018 between medium-sized agricultural enterprises and individual farms (medium enterprises have higher wages).

Fifth, in 2017 and 2019, there is no change in the amount of wages between medium-sized agricultural enterprises and individual farms.

Sixth, based on the value of the t-test for independent samples (Table 3), the existence of a significant difference between the achieved profit in all three examined years in the observation of medium-sized farms and individual farms was confirmed. In 2017 and 2018, higher profits were achieved on individual farms than in medium-sized enterprises, while in 2019 the situation was reversed.

Seventh, there is a statistically significant linkage (Table 4) between the wage level and the realized profit, i.e. it is in the positive direction only for 2017 (at the level $p < .05$), while for the remaining two years there is no significant connection. That is, the increase in wages in 2018 and 2019 did not significantly affect the realized profit, either in positive or negative direction. Meanwhile, as Barker (2018) said: automation will lead to new, better-paying jobs, jobs that will likely be eliminated by robots in the future.

It is noticeable that in 2019 there was an increase in wages and a simultaneous occurrence of declining profits. This is a potentially significant trend, which requires further monitoring in similar researches in the Republic of Serbia as well as in other countries of the former Yugoslavia, as well as in transition countries where similar tendencies are observed.

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Conflict of interests

The authors declare no conflict of interest.

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COST OPTIMIZATION IN AGRIBUSINESS BASED ON LIFE CYCLE COSTING

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ABSTRACT

In efforts to achieve and sustain competitiveness and contribute to the goal of sustainable development of society, entity management requires information that will enable the adoption of adequate decisions. The changed business environment and the growing importance of the issues that emerge from the domain of traditional business, both spatial and temporal, have necessitated the monitoring of costs not only during the production phase, but throughout the entire grain cycle of the product. Since conventional cost accounting systems do not have the capacity to generate the above information, in theory and practice, a life cycle costing system (LCC) has been developed. The aim of the paper is to point out the specificity and importance of perceiving and capturing the impacts and consequential costs that arise during the life cycle of the product, with particular reference to agribusiness, precisely because of the complexity of optimizing costs in that sector.

Introduction

The business world is exposed to accelerated changes, followed by the emergence of numerous complex challenges, increasingly rigorous legislation and various stakeholder pressures. In such conditions, management should ensure not only the survival and development of the entities, but also to contribute to the sustainable development of a wider society through the business of the company. Regarding agriculture and the accompanying processing industry, accountability is even greater, given that, although they have an important role to play in ensuring food security of society, these sectors simultaneously represent an important source of emissions that degrades the environment and impairs quality of life.

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In order to succeed in this effort, it is necessary for the management to have adequate information on the impact of agricultural and food products throughout the life cycle. One of the important sources of information for decision-making is cost accounting. Since the information generated by conventional costing systems is an adequate response in circumstances where business conditions were far simpler, there was a need to calculate costs that would allow monitoring of value flows in a much more complex economic environment. As a result of the effort to provide relevant information, a whole range of advanced cost accounting systems have been developed that provide monitoring capability and some additional aspects of the business, not just flows of internally generated values, which at the same time provide the information necessary to prepare strategic responses to a number of contemporary challenges.

The paper will point out the specifics and importance of calculating costs by product life cycle phases, with a special emphasis on the challenges of cost optimization in the agribusiness sector.

Objectives of Life cycle costing

Although the first cost-of-living ideas in product life cycle phases appeared a little over half a century ago, the more intense application of the concept began three and a half decades ago in the United States. Namely, during the given period LCC had a binding character in the planning, design and construction of buildings, as well as various infrastructure projects. Over time, this system of calculation and cost management has found its application not only in other industries, but also in the public sector.

The basic idea of a life cycle costing (LCC) is to capture all the costs that arise from the creation of an idea, through the development of products, its production, and post-sales services, up to the withdrawal of the product from use. As such, the concept should provide a picture of overall costs over the life of a product, which is at the same time the starting point for assessing the viability of the product being monitored. While traditional cost accounting systems primarily focus on the production and sales phase, cost accounting by product life cycle stages includes and monitors costs incurred in the market research phase, design and product development during the manufacturing process, quality control, storage, distribution, handling, disposal and environmental protection. In other words, this system of calculation of costs generates information generated in the pre-production, production and post-production phase of the life cycle of the product (Iannone et al., 2016).

Basically, the decision to apply the LCC has many factors, and some of them are the following: the necessity to accurately identify cost drivers, support for strategic decision-making, product design improvement, the perception of the effects of applying new technology in the entity, budget projections for the future periods. In other words, the primary goal of applying this costing system is to provide information that will contribute to the realization of the goal of optimizing costs. Cost optimization is a very delicate task whose importance is particularly evident in terms of intensifying

competition, a significant increase in costs incurred in the product maintenance and disposal phase, due to violations of environmental regulations and the payment of various penalties and other (Dhillon, 1989).

Various variants of the LCC have been developed over time, ranging from the basic version which examines economic performance to the more advanced, which includes and considers the costs of social and environmental impact of the product.

Conventional LCC is most commonly used, as it has been successfully implemented for many years and as such focuses on the economic evaluation of the effects of resource use through individual phases of the life cycle, including the costs associated with the product, borne directly by one participants in the product value chain - manufacturer, distributor or user of the product (Vladisavljević & Vukasović, 2017). This variant of cost accounting often neglects the need to internalize external costs or costs that are not directly noticeable or not directly borne by one of the above-mentioned participants. In other words, this type of cost accounting significantly narrows down the concept of product life cycle, and therefore does not include all the costs that can actually arise during certain product life cycle phases. Conventional variant LCC includes costs incurred in the pre-production and production phase, then the costs of exploitation of products (related consumption of materials or energy), maintenance costs, costs of withdrawing products from use, disassembly and disposal (SIGMA, 2016).

An advanced variant of LCC refers to the inclusion of costs arising from degradation of the environment, that is the negative environmental effects of the product. These are external costs that are expected to have an internal character in the short term. The environmental approach to cost accounting can be used as a planning tool, but also in accounting for reporting purposes. The concept is often used for the purpose of evaluating and selecting alternatives in the product design phase, since precisely this phase predominantly defines future emissions, and therefore costs during product lifecycle (UNEP, 2009).

For cost-benefit analysis and cost control that is related to a particular product, it is necessary to extend the concept of life cycle to include a wider set of costs, respecting those costs, which not only directly but indirectly (through externalities or impacts on the wider environment) are tangling with stakeholders. It is a LCC that examines the social aspects of a particular product, or involves the effects of its production and use on a wider society (social well-being, job security, etc.). Accordingly, the management of the company is to recognize the social hotspot, or a problem that can contribute to the improvement of social conditions and social well-being (Prasara & Gheewala, 2018). For the purpose of determining the cost, this approach provides for the application of the company's time preference rate to be used when discounting the projected amount of costs (it is usually the application of an approximate value that is lower than 0.1% on an annual basis), but other approaches can be used (Lichtenvort et al., 2008).

One of the key specifics of the LCC is reflected in the requirement to include the concept of the time value of money while including and accounting for costs that will only arise

in the post-production phase, since these costs only arise after a few years when it comes to capital goods. This aims to ensure the comparability of individual amounts of costs, regardless of the stage in which the life cycle phases have occurred. Hence, the costs are to be expressed by monetary units of the same purchasing power, which means that the projected costs with the financial mathematics apparatus are reduced to the present value. These costs are expected, they will only occur in the future, more precisely in the period when the product is located with the buyer (user) and as such, these costs primarily encompass the monetary effects of the negative impact of the product on the environment and other stakeholders, then the maintenance activities (servicing) product and its withdrawal from use, after which the issue of the costs of disposal of products should be solved in an environmentally friendly way (Dhillon, 1989; Chessell, 2018).

From the previous it follows that the application of the LCC requires first to estimate the value of future costs, and then to determine the appropriate discount rate, in order to reduce the projected size to the present value. Costing assumes that it starts from known types and amounts of costs (historical data derived from normal business), then models based on expected performance using the professional judgment of accountants and other experts, considering the best assumptions regarding future technological and market trends (Bennett & Ferry, 1987).

According to the rule, the minimum discount rate must be at least equal to the average market interest rate corrected for the expected inflation rate, and for those needs can be used the weighted average cost of capital or the internal rate return method is applied during an investment decision process in an enterprise. The decision on choosing the discount rate is left to the management accountant.

The previous indicates that LCC can contribute to the sustainable development of businesses and society through the generation of information that will enable the identification of technologies, products and services that are economically, socially and environmentally friendly. In the continuation of the paper, the specifics of capturing the effects and estimating the associated costs through individual phases of the life cycle of the product will be considered.

Methods and Materials

The starting point for the successful implementation of the LCC is the assessment of the product's impact during its lifecycle (LCA). It is a technique that tends to identify, quantify and categorize the various potential environmental effects that occur at each stage of the product's lifecycle. This implies that the functional units that will be monitored are carefully defined, since different observation units result in different results. One of the elements to be considered when defining a functional unit in agribusiness is the yield and weight of the product. The key constraint of this approach is that in certain production lines such a defined functional unit does not fully reflect the complex effects of products and processes on the environment, which makes it possible to combine

more functional units (Cerutti et al., 2014), then the area of land used, product quality - organoleptic properties, nutritional composition, and others (Notarnicola et al., 2012).

What is specific to the mentioned concept of impact assessment, which through the company's products produces, is that the concept of the life cycle is not observed through a time dimension, as is the case with LCC, but the life cycle is viewed in the context of the physical chain of material flows that are related to the product, which arise from the phase of material acquisition, through production, to waste management (Gluch & Baumann, 2004).

According to Gunady et al. (2012) in the case of agricultural production it is possible to include the following phases and associated activities: pre-farm (extraction, processing, manufacturing, transportation to farm), on-farm (N-Fertiliser use, irrigation, on-farm transport), post-farm (storage, packaging, transportation to distribution centre and to grocer). The effect emanates from the emission depends on the amount and the properties of the emitted substance, the emission characteristics and the environment in which the emission is released (Finnveden et al., 2009).

Life-cycle impact analysis aims to enable (Davis Langdon Management Consulting, 2006):

- Identifying opportunities for improving product / service during its lifecycle;
- Making decisions in industrial, governmental and non-governmental organizations;
- Selecting relevant indicators of environmental performance and adequate measurement techniques;
- Implementation of the eco-labeling scheme of products and the eco-declaration of products as elements of sales promotion.

It is important to note that LCC is not a goal for itself. Namely, it is a part of a broader concept - the product life cycle management that tends to support the investment decision-making process through the design of costs that arise in the long run (Boussabaine & Kirkham, 2004), or through the efforts of continuous improvement to minimize negative environmental and socio-economic impacts (Reddy et al., 2015). In that sense, the stated costing system generates relevant information by supporting alternative decision-making, among other things for the needs of designing and optimizing product assortment, selecting production technology, and more.

Implementation of the life-cycle impact assessment concept according to the standards of the International Organization for Standardization (ISO 14040-14044) includes four stages (United Nations Environment Program, 2009):

- Determining the goal and scope of the research, defining a functional unit, modeling the approach to be applied;
- Life cycle inventory analysis refers to identifying where the products of the observed system are located, examining processes that lead to the creation of a product, a description of the flows that the company exchanges with the environment,

including the inputs directly from the nature (raw materials, land) and outputs that emerge in the form of emissions into air, water and land, the use of materials and energy. The amount of elementary flows exchanged is designated as a functional unit. At this stage, data for all processes defined in the model are collected and an adequate calculation is performed;

- Determining the size and significance of the impact associated with the Impact Assessment The social and environmental impact assessment is always carried out at the functional unit level (defined as a measure of the functioning of the system and used for the purpose of comparing and evaluating two or more systems);
- Interpretation of the obtained results of previous phases with defined objectives in order to make appropriate conclusions about the resulting environmental impact and accordingly make certain recommendations.

Once the environmental impacts are quantified, it is possible to approach the cost estimate. Costing techniques can be divided into two groups - qualitative (identifying similarities between products and suitable for use when considering a limited time frame - pre-judgment based on previous cases) and quantitative techniques that are much more precise and can be applied to different products for the needs costing throughout the whole life cycle. In practice, moving costs is often not linear, and the use of a larger amount of resources does not inevitably lead to a proportional increase in the output achieved. In addition to inventory analysis, sensitivity analysis is used to assess the environmental impacts. In this regard, the effects of replacing inputs, materials and sources of energy with negative environmental implications are examined (De Marco et al., 2018), or the effects of resource recycling on environmental performance (Song et al., 2013). On the other hand, the sensitivity analysis is used to examine the cost dynamics and other economic performances of the observed product, for example, based on the change in the applied discount rate (Rodger et al., 2018).

Results and Discussion

Cost optimization involves taking effort to reduce the value of the target function. The goal in this case is to achieve cost leadership. In doing so, it is necessary to take into account that the cost-reduction efforts do not impair the quality and functionality of the products, since they are important elements of product competitiveness and market share. The circumstance that at the same time it is necessary to achieve more goals - cost leadership and the corresponding product quality with a minimum ecological footprint, finding the optimal solution can be based on a multi-criteria analysis of the decision. This process involves identifying problems (decision-making context, identifying key stakeholders and their interests), structuring problems and developing alternatives and criteria for their assessment, evaluating performance and ranking alternatives by respecting each of the defined criteria, carrying out the key stakeholder values and decision makers, synthesis results, as well as an analysis of the sensitivity of the results on the changes in parameters in the models (Saarikoski et al, 2016). In the literature, the optimal solution is considered to be the solution that is maximally good or minimal bad.

LCC contributes to solving the problem of optimization, i.e. achieving a minimum function of cost function, primarily through identifying and comprehensively displaying the corpus of costs that can arise during the life cycle of a product. After that, the management of the company is to perform a strategic cost analysis and undertake activities towards their reduction to the optimal amount. One significant part of the total costs in conventional costing systems remains invisible, denying relevant information to decision makers. Thus, for example, conventional costing systems include direct costs such as material and work costs, as well as indirect costs allocated by appropriate keys. However, contingent costs related to environmental sanctions and penalties, costs arising from claims for injuries at work, environmental degradation, staff training, installation and maintenance of pollution measurement systems etc. become apparent only in the conditions of application of the LCC (Vlachy, 2014). Traditional cost accounting systems underwater the costs under the category of general costs.

Agriculture and related process industries undoubtedly have a significant impact on the environment and society and are often seen as a significant factor of environmental degradation, through greenhouse gas emissions and other pollution that, among other things, lead to climate change (Praća et al., 2017). Natural resources, especially land and water resources, play a key role in agricultural production. In order to ensure production efficiency, it is necessary to look at the effects of land, water and energy use. This is especially due to the fact that many resources for agriculture are currently being used in an unsustainable way. Impact analysis through the prism of the life cycle can be viewed at the level of the whole branch when observing the average ecological performance in the production of particular goods, for example, in one region or country, or at the micro level, when the subject of observation is the impact of a specific product or production technology at the level the observed company. It is about the impacts of the production and use / consumption of products on society and the environment - climate change, availability of drinking water, changes in soil quality, the impact of toxic substances on human health, the exhaustion of non-renewable resources, and others (Dusmanescu et al., 2014; Bjorn et al., 2018).

From the perspective of the concept of product life cycle, it is possible to identify six stages through which food products, as key agricultural products, have an impact on the immediate and wider environment: the production and transport of inputs to the farm, cultivation, processing, distribution, consumption and waste management. It is necessary to point out that the greatest impact is achieved in the initial stages, when the construction of accommodation capacities, the production of agro-technology and equipment, the preparation of land, the cultivation of animals and plant crops, the use of fertilizers and pesticides, the consumption of water, fuel and other are carried out. The processing involves the conversion of inputs produced on the farm into final food products. Distribution refers to transport before and after processing. In the consumption phase, environmental impacts are also reflected in the accompanying packaging, storage, food preparation and waste occurrence. Finally, waste management can be carried out using a variety of technologies – lazing in the land, incineration, compost production, and other methods (Dijkman et al., 2018).

The guiding principles for determining the environmental impact of food products (food and beverages) defined by the European Food SCP Round Table (2013) include: identifying and analyzing environmental impacts throughout the life cycle, identifying a significant potential life-cycle impact, application of scientific methodology, periodic review and review of environmental impacts in the supply chain, informing in a comprehensible and comparable way, a clear understanding of the framework and importance of environmental information, ensuring transparency of information, applied methodologies and assumptions used, support for innovations, environmental protection and consumer awareness.

In the continuation, for the production and processing of raspberries, the implementation of the life cycle concept will be presented for the purposes of identifying potential environmental impacts and thus the costs that arise, through the stages defined by ISO that were previously shown in the paper. Because of its biological properties, berries are not persistent and calibrate quickly, which requires them to be frozen or processed as soon as possible in products with a higher degree of added value. In addition, manufacturers may consider whether to offer a conventional cultivated or organic raspberry to the market. Each of the above alternatives carries with it certain influences on the environment, and therefore costs and benefits.

Objective and framework of the research - Evaluation of the ecological, social and economic impacts of the two products - products made from conventional raspberries and products for which the raspberries used are produced by respecting the principles of organic production. The functional unit can be defined per kilogram of fresh raspberries used, which provides an opportunity to look at and compare the ecological impact of raspberries produced at different locations. The results can be expressed per hectare of land surfaces to see the effects of the applied preparations in a particular region.

Analysis of input and output flows that are the subject of exchange with the environment include the production of preparations and equipment used in the preparation of soil for raspberry cultivation, purchase of seedlings, procurement of necessary equipment, transport means, use of pesticides and inorganic fertilizers, construction of production and storage capacities, procurement of sugar and alternative sweeteners, packaging production, water consumption, electricity, fossil fuel during work and transport, waste disposal, and others (Tamburini et al., 2015).

Identifying the impact on the environment of each of the observed products: Organically produced raspberries require the exploitation of a larger area of land, as lower yields are achieved than conventional production. Lower raspberry yield in organic production requires the cultivation and exploitation of a large number of seedlings, which further leads to increased emissions and intensification of climate change. On the other hand, the conventional product leads to contamination of soil and waterways.

Identifying the impact on the environment of each of the observed products: Organically produced raspberries require the exploitation of a larger area of land, since lower yields relative to conventional production are achieved. Lower raspberry yield in organic

production requires the cultivation and exploitation of a large number of seedlings, which further leads to increased emissions and intensification of climate change. On the other hand, the conventional product leads to contamination of soil and waterways.

When analyzing costs arising from various activities that the company applies in the production process, it is necessary to identify the key cost drivers, to make efforts to reduce the amount of costs incurred and, based on that, make decisions about the type and extent of production in the coming periods. In addition to the expenditure component, it is necessary to also look at uses or incremental incomes that can be achieved by choosing an environmentally friendly alternative. These are revenues that can be realized on the basis of ecological premium, building company reputation, increasing market share, customer loyalty, and more. In order to achieve comparability, on the costs and revenues that will arise in future periods, it is necessary to apply the appropriate discount rate in order to determine their present value. Cost optimization through the prism of the concept of product life cycle in agribusiness entities should contribute to finding economically, socially and environmentally acceptable solutions for the production recipe, packaging and transport of food products (Notarnicola et al., 2017).

The circumstance that potential impacts are observed at company level, but also from the perspective of all supply chains, it is necessary to determine the costs and benefits that will arise for individual participants in the product value chain as well as key stakeholders. On the basis of cost-benefit analysis, management will identify alternatives where the most cost-benefit ratio is the most favorable.

Conclusion

Cost accounting as an important source of information should support management decision-making in order to ensure competitiveness of the entities and enable corporate and socially sustainable development. This challenge can very successfully respond to the calculation of costs by product life cycle phases. The purpose of the stated costing system is to enable the optimization of total operating costs, which is achieved by capturing and monitoring additional categories of costs that are not the subject of consideration in conventional cost accounting systems. In other words, this means that it also includes some additional aspects of business that have strategic significance for agribusiness entities, such as the impact of products and processes on the wider society, the environment and related climate change. This costing system represents the segment of a broader concept - Life cycle management, which seeks to support the decision-making process and through efforts to achieve continuous improvements in the production process, contributing to the minimization of negative environmental and socio-economic impacts, and thus the overall cost of doing business. In this regard, LCC provides significant information support in alternative business decision-making and efforts to achieve sustainable development of enterprises and society.

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Conflict of interests

The authors declare no conflict of interest.

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ANALYSIS OF TOURIST TURNOVER IN A RURAL TOURISM DESTINATION – CASE STUDY OF IVANJICA

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ABSTRACT

The purpose of the paper is to present a rural tourism destination and its tourist turnover, in the case study of Ivanjica municipality. Rural tourism is one of the leading tourism products in the global tourism market. Rural tourism destinations have become very prominent in many countries, including Serbia. Within these destinations there are various tourism elements such as traditional culture, archaeological and architectural heritage, gastronomy, recreation, history, sports, etc. Rural area is not just a village. Rural areas also refer to all settlements with no city status. The paper presents the statistical analysis results of tourist turnover in Ivanjica municipality from 2011 to 2018. The statistical analysis is based on data obtained from Tourist Organisation of Ivanjica. Based on analysis results, Discussion and Conclusions provide an overview of the current situation, as well as recommendations for future activities aimed at improving tourist turnover in this destination.

Introduction

Tourism is an activity which may have a significant influence on the economic, social, functional and physiognomic structure of rural areas. Village tourism is a very broad concept, which includes not only a vacation in the countryside, but also various other tourist activities in rural areas (Todorović, Bjeljac, 2009). Hall and Richards (2005) strongly emphasise the pressure of contradiction that exists between successful tourism development (generally speaking more visitors) and attractiveness of rural regions (in general peace and silence). The international growth of inbound travels has been reflected in positive numbers in the inbound tourism as well (Fodranová et al., 2019).

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Tourism as an activity indicates the overall economic and cultural development and standards of a country. Tourist movements are an integral part of modern civilisation. By their own nature and development possibilities, they have become an important factor of the overall economic development of Serbia (Plavša, Gajić-Ostojić, 2010). Tourism is particularly important for economies in transition with increasing number of unemployed industrial workers looking for their business opportunities in rural areas (Štetić, et al., 2014). Also, tourism industry enhances many economic and non-economic activities, stimulates underdeveloped regions and increases employment (Čomić, Kosar, 1996). In other words, rural tourism has long been considered a means of achieving economic and social development and regeneration. More specifically, it has been widely promoted as an effective source of income and employment, particularly in peripheral rural areas (Sharpley, 2002).

The Republic of Serbia has no official definition of rural areas. The existing statistical classification of settlements is most often used for defining rural areas. This classification is based on the legal criterion for determining urban settlements, while settlements outside this category are classified as other settlements and thus identified as rural settlements (Gajić, 2015). Depending on the problems and objectives of the research, countries across Europe use different criteria for defining rural and urban areas. The only internationally accepted definition of rural and urban areas is based on the methodology used by the OECD (Organisation for Economic Co-operation and Development), which defines rural areas by population density.

Rural settlements are settlements with population density below 150 inhabitants per km2 (OECD, 2011). According to this definition, rural areas occupy about 90% of the territory of the Republic of Serbia, with about 43% of total population living in these rural areas. Serbia does not have a long tradition in rural tourism. However, the 1970s may be considered as a start of village tourism in Serbia. Although Serbia possesses a diversified structure of attractiveness, this structure is not accompanied by an adequate profile of tourist products (Todorović, Bjeljac, 2009).

As a very important component of tourism development, tourist turnover provides data on tourist movement patterns in a destination (Omerović, 2014). In fact, tourist turnover is an indicator of the total number of tourists and their overnight stays. It's systematic and aggregate indicator, because it includes both above mentioned categories (the total number of tourists and overnight stays). There are three dimensions of tourist turnover: volume, dynamics and structure. The volume refers to a number of tourists and/or a number of their overnight stays. Dynamics as turnover dimension, expresses a change in its volume over a given time period. A tourist turnover structure represents its distribution and is most often shown as a percentage (in relation of the total amount or volume of tourist turnover). In this regard, tourist turnover can be viewed as the volume, dynamics and structure of the total number of tourists i.e., the volume, dynamics and structure of the realised overnight stays (Bakić, et al., 1999).

Keeping records of tourist turnover is mandatory and regulated in most countries. Turnover of domestic tourists and turnover of foreign tourists are separated. The estimation of the tourist turnover volume is based on the Statistical Office of the Republic of Serbia's official data. The available tourist turnover data are summarized and then divided by the number of reported years. The tourist turnover volume is estimated using the following statistics (Regulation for categorization of tourist sites, 2015):

- a number of tourist arrivals;
- a number of overnight stays in the accommodation facilities;
- a number of overnight stays in the accommodation facilities during a year compared to resident population.

Regarding tourism demand forecasting, there are numerous models for forecasting foreign tourist arrivals. Over the past three decades, SARIMA (Seasonal Autoregressive Integrated Moving Average Model) is one of the most popular time series model in the field of tourism demand forecasting. In addition, Grey model has been successfully applied in tourist arrivals forecasting (Chandra, Kumari, 2018).

As a typical rural tourism area, Ivanjica is very attractive especially for tourists coming from large industrial urbanized zones and lowland areas. Ivanjica municipality fosters all forms of tourism, ranging from health tourism to rural tourism.

Rural tourism in Ivanjica municipality

Ivanjica is a small town and municipality located in Moravica District of south-western Serbia. Ivanjica is the administrative, economic and cultural centre of this region. It is 224 km away from Belgrade. The current population of the municipality is 32,385. Its geographical position and the fact that it is surrounded by the mountain ranges of Golija, Javor, Mučanj, Čemerno i Radočelo, make Ivanjica an exceptional destination for rural tourism development. Because Ivanjica municipality is very rich in natural wealth, huge forest resources, numerous water sources and has a good road infrastructure, it's extremely interesting area for developing all tourism forms.

Ivanjica is rich in natural attractions such as mountains, rivers and lakes. An interesting example is young and still unexplored lake called Nebeska suza (Heaven's Teardrop). The lake was formed after a huge earthquake in Romania in 1977. It has the largest area of all the lakes in Ivanjica municipality (Ostojić, Marković, 2015). The Government of the Republic of Serbia proclaimed Ivanjica to be the first air spa in Serbia in 2000. The United Nations Educational, Scientific and Cultural Organisation (UNESCO) declared Golija Mountain the First category Park of Nature and the Biosphere Reserve in 2001. 70% of Golija Mountain is located at the territory of Ivanjica municipality (Ćurčić, 2001). All these facts emphasise the natural potential of Ivanjica and are excellent prerequisites for rural tourism investment and development.

The tourism market is very dynamic and is subject to numerous and frequent changes. The specific tourism market (such as rural tourism) requires specific tourism marketing strategies. Business goals achievement at a tourist destination depends on its ability to satisfy needs of consumers using the optimal combination of marketing instruments and strategic alternatives.

In the literature there are different interpretations of the concept of rural tourism and its manifest forms, determined by the characteristics of the rural area and the availability of resources for the development of rural tourism. For the hosts it is a commercial activity which opens the doors of their homes for guests to enjoy in recreational activities in predominantly rural areas. A wide range of activities that constitute rural tourism product indicates that this form of tourism has no precisely defined target group of tourists (Milićević, et al., 2015).

Ivanjica has significant tourist values. Valorised in unity with natural sights, they make a huge tourism potential. By their appearance, anthropogenic tourist values can be classified as follows:

- archaeological
- monumental
- ethnographic
- ambient
- manifestation.

Ivanjica was declared a tourist destination at the beginning of the third decade of the 20th century. Some of the main accommodation facilities in Ivanjica are: Park Hotel (built in 1976, categorised with 4 stars and equipped with 140 beds in single-bed and double-bed rooms as well as 3 apartments and many other modern facilities), Moravica Hotel, Vacation centre Golija (126 beds), etc. In villages near Ivanjica, there are hotels: Golijska Reka in the heart of Golija, Dubrava in Prilički Kiseljak and Javor in Kušići. Happy guests show a larger degree of satisfaction and loyalty and they visit the hotel again, recommend it to their friends, that affects the hotel's profits, and development of tourism as a whole (Vujić, et.al, 2019, p.61). Also, there are several hotels and motels with smaller capacities, such as Mona Hotel in Kušići (on the slopes of Javor), Logos Hotel in Katići (on the slopes of Mučanj), Opaljenik (Javor) and Kapija in Međurečje. In addition, there are many country households and several ethno villages.

Special rehabilitation centre was opened in 1948 and modernised in the 1980s. It represents a combination of health and tourist facilities and has 270 beds in single-bed, double-bed and three-bed rooms, two apartments and accompanying modern facilities (Ostojić, 2011). The oldest tourist destination in Ivanjica municipality is certainly Prilički Kiseljak. It is a spa with average altitude of nearly 500 m (Ostojić, Marković, 2011). There are numerous cultural events in Ivanjica, such as the Nušićijada festival. Nušićijada is an annual comedy festival named after Branislav Nušić, a famous Serbian

comedy playwright. This cultural event gathers nearly 50,000 visitors every year (www.ivatourism.co.rs).

As the main tourism destination in this region, Ivanjica realises more than 100,000 overnight stays annually, with an average length of stay of five days per guest. Most of the visitors are domestic guests. The season lasts from May to October, and in January (because of winter school holidays), with the season peaks in July and August. Over the past five years, Ivanjica has recorded a very dynamic growth of tourist turnover, after a long period of stagnation (resulting from the general social and political instability) (Marković, et al., 2005).

The research methodology

The research questions

The main goal of this research is to explore tourist turnover in Ivanjica municipality. The research questions are as follows:

1) Is Ivanjica being more visited by domestic or by foreign tourists?

2) Do domestic and foreign tourists both realise the same number of overnight stays?

3) Has the number of domestic tourists visits changed over time?

4) Has the number of foreign tourists visits changed over time?

5) Has the domestic tourists' length of stay changed over time?

6) Has the foreign tourists' length of stay changed over time?

7) Has the accommodation capacity changed over time?

8) Has the total length of stay changed over time?

9) Has the total number of tourist visits changed over time?

The research included 4 hotels, a mountain lodge, a rehabilitation centre, a resort and all private accommodation facilities. The sample was the same during the observed time period, i.e., the observed tourist facilities didn't change.

Data Analysis

Data analysis was performed using secondary data from Tourist Organisation of Ivanjica. The analysis considered tourist turnover in Ivanjica municipality from 2011 to 2018. The Independent Samples t Test was used to determine differences between the number of foreign guests and the number of domestic ones. The t test also was used to determine differences between the number of foreign tourists' overnights and the number of domestic tourists' overnights.

Analysis of variance (ANOVA) with repeated measures was performed (with Greenhouse-Geisser correction because the assumption of sphericity was violated) to

determine: differences in the number of domestic tourists in the observed time period; differences in the number of foreign tourists in the observed time period; differences in the number of domestic tourists' overnights in the observed time period; differences in the number of foreign tourists' overnights in the observed time period; differences in the number of beds in the observed time period; differences in the number of overnight stays in the observed time period; and differences in the total number of tourists in the observed time period.

Results and Discussion

Table 1. Descriptive statistics

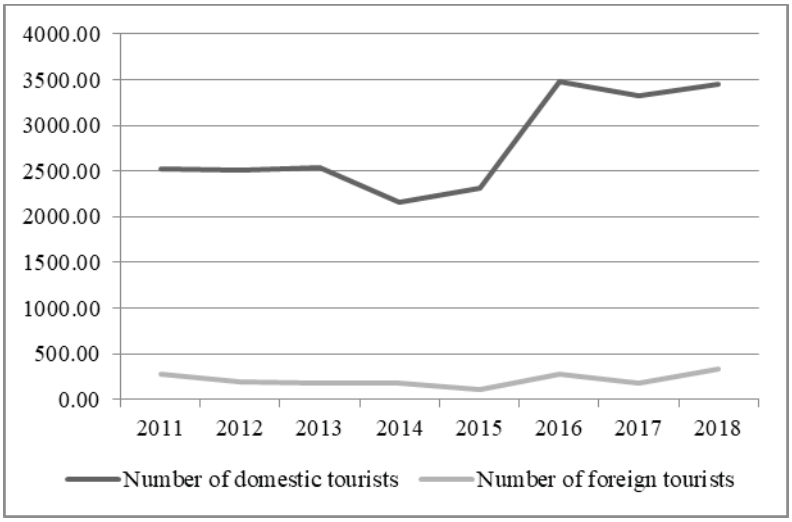
Year		N	Mean	Median	Mode	Standard Deviation	Min	Max
2011	Number of rooms	8	53	48,5	26	31,924	18	108
	Number of apartments	5	5,2	5	2	3,421	2	10
	Number of beds	8	133,75	117	94	74,308	42	270
	Number of domestic tourists	6	2526,33	1776	249	2579,928	249	6940
	Number of foreign tourists	5	279,8	88	30	361,334	30	880
	Number of overnight stays of domestic tourists	6	15625,3	5942	1007	25296,012	1007	66350
	Number of overnight stays of foreign tourists	5	728,6	176	65	1036,201	65	2524
	Total number of tourists	6	2759,5	1976,5	279	2690,962	279	7028
	Total number of overnight stays	6	16232,5	7564	1072	25177,437	1072	66526
2012	Number of rooms	8	48,38	33	6	38,037	6	108
	Number of apartments	4	5	2,5	2	5,354	2	13
	Number of beds	8	131,88	107	94	79,319	42	270
	Number of domestic tourists	6	2505,17	2121	240	2289,532	240	6085
	Number of foreign tourists	5	195,6	103	20	261,459	20	659
	Number of overnight stays of domestic tourists	6	15457,5	4327	750	22413,932	750	57680
	Number of overnight stays of foreign tourists	5	399,8	149	30	557,711	30	1376
	Total number of tourists	6	2668,17	2505	260	2359,056	260	6188
	Total number of overnight stays	6	15790,7	5015	780	22348,43	780	57783

Year		N	Mean	Median	Mode	Standard Deviation	Min	Max
2013	Number of rooms	8	37,75	27,5	18	33,005	6	108
	Number of apartments	5	18	3	2	29,436	2	70
	Number of beds	8	132	110	50	84,801	50	270
	Number of domestic tourists	6	2534,5	2080,5	156	2714,937	156	7145
	Number of foreign tourists	5	184,4	65	11	324,021	11	762
	Number of overnight stays of domestic tourists	6	15025,8	4311	277	23423,906	277	60660
	Number of overnight stays of foreign tourists	5	488,6	203	11	764,024	11	1842
	Total number of tourists	6	2688,17	2198,5	167	2778,212	167	7160
	Total number of overnight stays	6	15433	5333,5	288	23329,527	288	60755
2014	Number of rooms	8	37,75	27,5	18	33,005	6	108
	Number of apartments	5	18,2	3	2	29,878	2	71
	Number of beds	8	132,5	110	50	85,57	50	270
	Number of domestic tourists	6	2161,83	1650,5	108	2296,05	108	5949
	Number of foreign tourists	5	177	56	4	289,778	4	689
	Number of overnight stays of domestic tourists	6	12663,3	2877	191	20377,908	191	51981
	Number of overnight stays of foreign tourists	5	466,2	183	16	727,5	16	1760
	Total number of tourists	5	2749,6	3148	120	2305,064	120	5965
	Total number of overnight stays	6	13051,8	3848,5	207	20292,331	207	52127
2015	Number of rooms	8	37,75	27,5	18	33,005	6	108
	Number of apartments	5	18,2	3	2	29,878	2	71
	Number of beds	8	132,5	110	50	85,57	50	270
	Number of domestic tourists	5	2318,4	1085	41	2685,774	41	6183
	Number of foreign tourists	4	109,5	60,5	15	132,475	15	302
	Number of overnight stays of domestic tourists	5	16280,6	1737	187	24415,522	187	56753
	Number of overnight stays of foreign tourists	4	271,25	104,5	71	356,354	71	805
	Total number of tourists	5	2406	1387	41	2688,631	41	6274
	Total number of overnight stays	5	16497,6	2542	187	24331,077	187	56844
2016	Number of rooms	6	62,17	49,5	32	41,878	18	114
	Number of apartments	0						
	Number of beds	6	156,67	125	42	97,508	42	279
	Number of domestic tourists	5	3477,8	3789	210	3328,542	210	8063
	Number of foreign tourists	4	275,25	32	2	507,213	2	1035
	Number of overnight stays of domestic tourists	5	18655,8	9046	735	25150,27	735	60996
	Number of overnight stays of foreign tourists	4	628,75	116	2	1104,941	2	2281
	Total number of tourists	5	3698	3849	210	3478,161	210	8065
	Total number of overnight stays	5	19158,8	11327	735	24952,429	735	60998

Year		N	Mean	Median	Mode	Standard Deviation	Min	Max
2017	Number of rooms	6	61,83	48	18	42,823	18	114
	Number of apartments	0						
	Number of beds	6	151,17	112	42	97,008	42	291
	Number of domestic tourists	6	3325,17	2510	109	3433,496	109	7966
	Number of foreign tourists	5	185	25	3	329,84	3	770
	Number of overnight stays of domestic tourists	6	16544,7	8059	492	22344,158	492	57888
	Number of overnight stays of foreign tourists	5	389,8	68	6	701,106	6	1634
	Total number of tourists	6	3479,33	2578,5	109	3591,441	109	7981
	Total number of overnight stays	6	16869,5	8879	492	22336,868	492	57903
2018	Number of rooms	6	61,17	48	18	42,654	18	114
	Number of apartments	0						
	Number of beds	6	149,67	125	42	91,577	42	268
	Number of domestic tourists	5	3452,8	4268	177	3111,89	177	7129
	Number of foreign tourists	3	338,67	49	2	542,929	2	965
	Number of overnight stays of domestic tourists	5	19052,4	10781	1048	24046,546	1048	58970
	Number of overnight stays of foreign tourists	3	792,33	736	4	817,956	4	1637
	Total number of tourists	5	3656	4317	179	3289,882	179	7129
	Total number of overnight stays	5	19527,8	12418	1052	23946,246	1052	58970
TOTAL	Number of rooms	58	48,76	32	18	35,849	6	114
	Number of apartments	24	13,25	3	2	22,549	2	71
	Number of beds	58	138,72	112	100	81,348	42	291
	Number of domestic tourists	45	2768,07	2333	41	2631,054	41	8063
	Number of foreign tourists	36	212,89	62,5	15	318,243	2	1035
	Number of overnight stays of domestic tourists	45	16041	4447	187	21539,591	187	66350
	Number of overnight stays of foreign tourists	36	509,5	167	226	722,026	2	2524
	Total number of tourists	44	3002,7	2761,5	41	2722,018	41	8065
	Total number of overnight stays	45	16448,6	6207	187	21456,816	187	66526

Source: Authors' calculations

Figure 1. The number of tourists in the observed time period

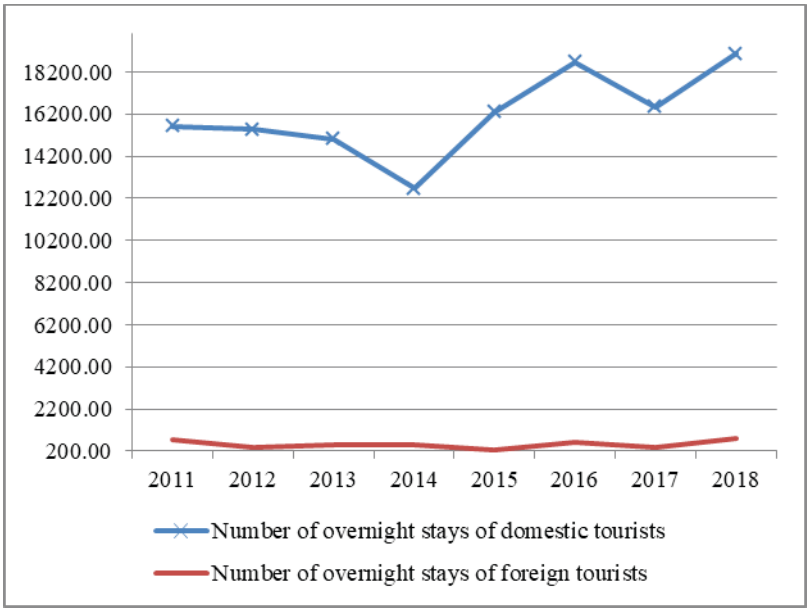


Source: Authors' calculations

It can be noted that on average Ivanjica was visited more by domestic tourists (124563) than by foreign tourists (7664). On average, the number of domestic tourists (M=2768.07) grew at a rate of 4.56% per year, while the number of foreign tourists (M=212.89) grew at an average annual rate of 2.76%. It can be noted (Figure 1.) that in 2005, there was a large increase in the number of domestic tourists. In the observed time period Ivanjica municipality was significantly more visited by domestic tourists (M=2768.07; SD=2631.05) than by foreign tourists (M=212.89; SD=318.24); t (46)=6.46; p=0.00. The results indicate that this area must be focused on attracting more foreign tourists. Ivanjica municipality has a potential to do so, but it is important for tourism officials to better understand the needs of potential foreign visitors and to design appropriate tourism marketing strategies.

There were no significant differences in the number of domestic tourists in Ivanjica municipality in the observed time period, F (1.02)=2.82; p=0.17; partial η^2=0.41. It was also found that there were no significant differences in the number of foreign tourists in Ivanjica municipality in the observed time period, F (1)=1.09; p=0.49; partial η^2=0.52.

Figure 2. The number of overnight stays in the observed time period

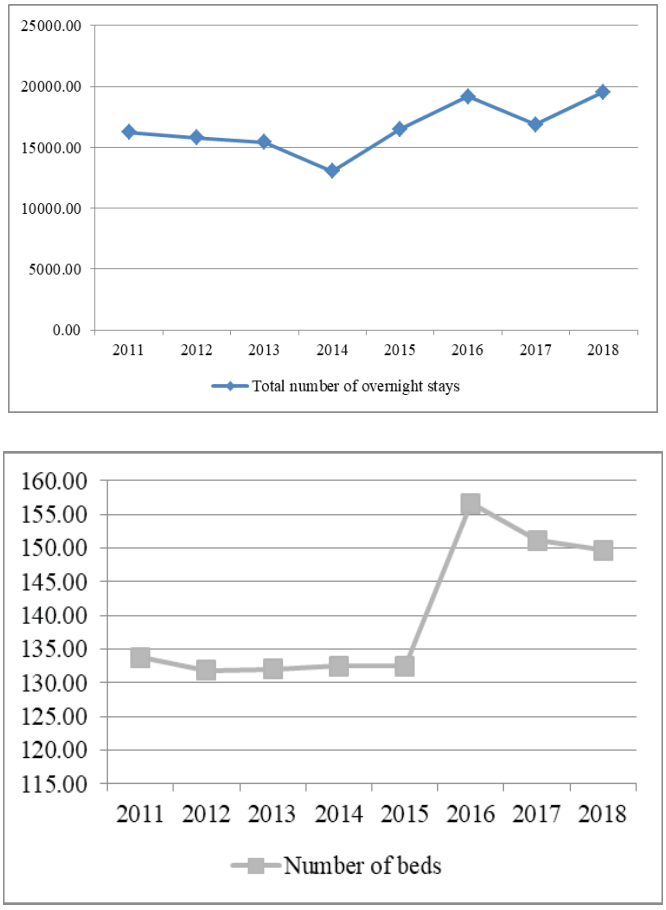


Source: Authors' calculations

The Figure 2. shows that domestic tourists realised more overnights on average (721844) than foreign tourists (18342). On average, the number of overnight stays of domestic tourists (M=16040.98) grew at a rate of 2.87% annually, while the number of overnight stays of foreign tourists (509.50) grew at an average annual rate of 1.21%. There was a huge increase in the number of domestic tourists in 2015 in Ivanjica. Fewer visits of foreign tourists resulted in fewer overnights of those tourists compared to domestic ones. The strategy for improving poor statistics must be aimed at better identifying needs of existing and potential foreign tourists.

In Ivanjica, domestic tourists realised much more overnight stays (M=16040.98; SD=21539.59) than foreign tourists (M=509.50; SD=722.03); t (44)=4.83; p=0.00. There were no significant differences in the number of overnight stays of domestic tourists in the observed period, F (2.06)=1.30; p=0.32; partial η^2=0.24. There were also no significant differences in the number of foreign tourists in the observed period, F (1)=0.91; p=0.51; partial η^2=0.48.

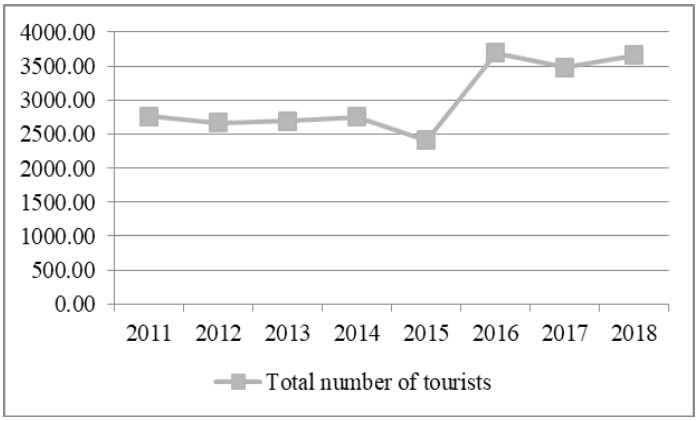
Figure 3. The number of overnight stays compared to the number of beds in the observed time period

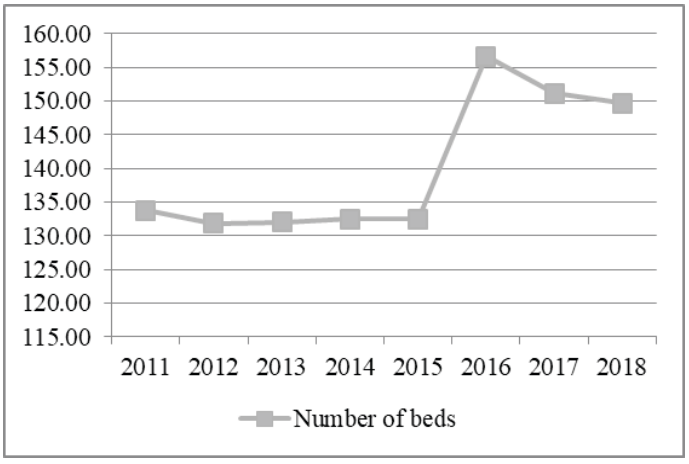


Source: Authors' calculations

The figure 3. shows that in 2014 there was a decline in the total number of overnight stays and in the following year it increased and reached its peak in 2018. On average, the number of beds grew at a rate of 1.62% annually, while the number of overnight stays grew at an average annual rate of 2.68%. There were no significant differences in the number of beds in the observed period, F (1.50)=1.14; p=0.35; partial η^2=0.19. There were also no significant differences in the number of overnight stays in the observed period, F (2.07)=1.23; p=0.33; partial η^2=0.24.

Figure 4. The number of tourists compared to the number of beds in the observed time period

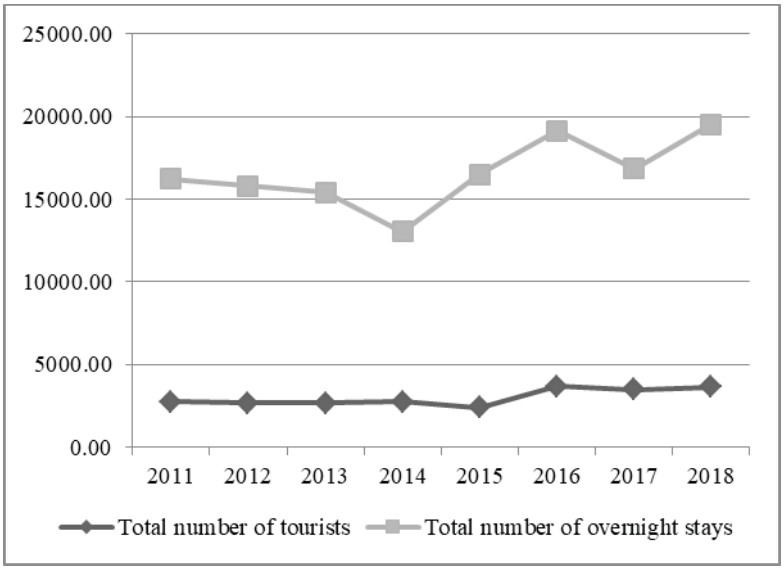




Source: Authors' calculations

The figure 4. shows that there was a significant increase in the number of tourists in 2016. On average, the number of beds grew at a rate of 1.62% annually, while the number guests grew at an average annual rate of 4.10%. There were no significant differences in the number of tourists in the observed period, F (1.33)=2.31; p=0.21; partial η^2=0.43.

Figure 5. The number of tourists compared to the number of overnight stays in the observed time period



Source: Authors' calculations

The figure 5. shows that in 2014 there was a decline in the total number of overnight stays and in the following year it increased and reached its peak in 2018. On average, the number of tourists grew at a rate of 4.10% per year, while the number of overnight stays grew at an average annual rate of 2.68%. There was a significant increase in the number of overnight stays in 2016.

Conclusions

In the past Ivanjica was not an attractive tourism destination. It was just a small Serbian town. But today Ivanjica is something completely different. Especially over the past five years Ivanjica has recorded a very dynamic growth of rural tourism offer and tourist turnover. As a typical rural tourism destination, Ivanjica municipality has very attractive attributes especially for tourists coming from large industrial urbanised areas and lowlands and looking for a peace and a beautiful nature. Various tourism forms are possible in Ivanjica municipality, but rural tourism is a dominant one.

But the tourism potential of this area is not completely exploited. This should be a great challenge and inspiration in the future. Ivanjica municipality and its tourist organisation have to use all available resources in order to improve and promote rural tourism. The emphasis should be on a sustainable rural tourism. The long-term development strategy requires the institutional issues to be solved in a timely manner. A rural tourism management has to take into account economic and environmental sustainability of Ivanjica municipality.

In terms of tourist turnover structure, domestic tourists are dominant. But Ivanjica has a potential to attract more foreign guests, considering that investments in Golija for developing winter tourism are expected. It should not be forgotten that Ivanjica was declared an air spa, and therefore it is interesting as a destination with healthy food and clean air. For further development of rural tourism it is necessary to include the richness of biodiversity and ecosystems in the tourism offer. The whole world is increasingly turning to so-called eco-destinations. This is a great opportunity for Ivanjica, because it is rich in exceptional natural resources. So far, rural tourism development in Ivanjica municipality has not jeopardised the resources on which it is based, so they remain preserved for the generations to come.

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Conflict of interests

The authors declare no conflict of interest.

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THE CONCEPT OF BUSINESS CLUSTERS AND ITS IMPACT ON TOURISM BUSINESS IMPROVEMENT

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ABSTRACT

Increasing competition in the tourism market leads to the justified need for forming tourism clusters. Joining in clusters has numerous benefits for cluster members. Clustering leads to increased competitiveness of cluster members, because of the improved productivity and efficiency of work, adopted innovations, development of new technologies and introduction of the new quality standards and better market access. The purpose of this paper was to analyze tourism clusters models and to introduce the most suitable tourism cluster model for Serbia, based on the examples of good practice. Authors conducted a comprehensive literature review and proposed a new definition for cluster and accordingly determined new tourism cluster definition. Context of research is mostly related to cluster members. This paper contributes to research and development of clusters with a particular review of tourism clusters and suggests decision-makers in tourism what is the most suitable tourism cluster model they should consider.

Introduction

Globalization affects all aspects of modern living, so business representatives need to adapt. Competition in the tourism market is rapidly increasing. There are many stakeholders in this business conditions, such as areas of different size (countries, regions, cities and micro areas), small and medium-sized enterprises, large businesses and individuals. Because of the variety of tourist destination, tourists are also becoming

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more demanding. In the last decades of the last century, tourism market gained a larger proportion and became more important. Tourism is a dynamic category that is continuously developing in the World (Cvijanović, et al., 2018) and consist of all phenomenon and relationship created from the interaction of tourists, suppliers and travel merchant, governments and communities in the process of tourists attraction and welcoming (Hadaiani et al., 2012).

Tourism stakeholders have to identify different approaches and tools to successfully present a tourist destination (Cvijanović et al., 2019). They develop effective models for the tourist markets to stay competitive and forming or joining a tourism cluster is one of the effective approaches. Clusters are not only a relatively new approach to business thinking, but they are also an inspirational theme in academic circles. Modern organizations are trans-organizational systems because do not represent a traditional exchange of the final product. They exchange information and knowledge, including reciprocal functions and obligations with partner firms. There are numerous forms of partnerships in tourism. Tourism is considered as fragmented industry and according to statements in the academic circles, the cluster approach is convenient for sectors or activities with fragmented structure. Hill and Jones (2004) point out that characteristics of fragmented industries are isolated markets with low entry barriers, low opportunities for large scale economies, overcoming focus strategy, such as consumer groups or regions. Competing in fragmented industries requires strategic consolidation through various forms of linking, horizontal merging, franchising, networks on Internet and cluster association. Bakić (2009) highlighted that the wideness of cooperation implies the need to establish regional cooperation in tourism and make integrated touristic products. This exceeds national barriers and networking of interests based on creating additional benefits for tourists.

Aim of research in this paper is to point out interests for forming clusters, and particularly to emphasize contributions and benefits of clustering in tourism. This paper has been divided into three parts. Authors began by addressing the need for adjusting to the new challenges on the tourist market caused by globalization and modern living. Next part of the paper refers to joining into clusters and cluster characteristics and concept of clustering to improve business. In the end part, the authors examined the analysis of different cluster models and proposed the most suitable tourism cluster model for Serbia. A context of cluster study is mostly referred to the cluster members. The paper could be useful to interested managers in tourism, creators of economic politics, decision-makers, and the general public.

About clusters and clusterism

Great popularization of clusters that have wide application in the developed business world is still actual. Even though it is nearly three decades since Porter (1990) made the term "cluster" popular and then encouraged by Krugman (1991), their importance is still present. Porter made the term "cluster" popular in theoretical circles, but it should be mentioned that it was even before (Marshall, Guillebaud, 1961). Porter (1998, p.

78) has determined clusters as *geographic concentrations of interconnected companies and institutions in a particular field, linked by commonalities and complementarities*.

The activities of cluster members must be associated with cluster goal. Porter (1998) observe cluster influence on competition in three broad ways: (1) increasing the productivity of cluster members; (2) future productivity growth by driving the direction and pace of innovation; (3) stimulating the formation of new businesses that leads to expanding and strengthening of the cluster itself. Cluster members simultaneously cooperate and compete. Some authors (Martin, Sunley, 2003) consider that in the last few decades clusters have become a brand and they call it "Porter brand". Authors (Marshall, 1920; Porter, 1990; Krugman, 1991; Ellison, Glaeser, 1997) agree that the agglomeration of related economic activity is a central feature of economic geography. Porter (2007) determined clusters as geographic concentrations of firms, suppliers, support services, specialized infrastructure, producers of related products, and specialized institutions that arise in particular fields in particular areas. Clusters are geographic concentrations of related industries and associated institutions (Delgado et al., 2014). There are different theoretical approaches to clustering. Some emphasize its structure and characteristics, other economy impact and the need for clustering.

Organizations joined in clusters have better interactions and exchange of information, knowledge, and experiences which produce synergic effects. Linking in network structures, as well as horizontal and vertical merging, cluster members relativize their deficiencies and potentiate advantages thereby achieving the necessary competitiveness in the market (Vukotić et al., 2013). Initiatives for cluster development are an important direction in the economic politics, market opening and reducing the business expenses (Mauroner, 2015).

Holub-Iwan (2012) in his research found that cluster structures can be very diverse and it depends on the economic potential of the cluster members. Certain authors (Zheliazkov et al.., 2015) emphasize that, since 2000, researchers examined the characteristics of clusters, the ways of identifying them and their influence on the market environment. Nordin (2003) concurrently observe clusters as a group of companies that are forming alliances and cooperating and as competitors in certain areas. Rosenfeld (1998, p. 4) determined clusters as *a geographically bounded concentration of interdependent businesses with active channels for business transactions, dialogue, and communications, and that collectively shares common opportunities and threats*.

Vučković (2016) recognized clusters as an instrument for strengthening productivity and innovation in small and medium-sized businesses in the national economy. Feser (1998) emphasized that economic clusters are related and supporting institutions that are more competitive by their relationships and not just related and supporting industries and institutions. Clusters can be also considered as a complicated and sophisticated form of association of producers and private sector, scientific and educational institutions and the public sector (Parausić, & Domazet, 2018).

Roelandt and den Hertog (1999) characterized clusters as networks of producers of strongly interdependent enterprises that are linked in a production chain that add more

value. Cluster members are competing and collaborating simultaneously and because of that, clusters have a better chance to be more competitive on a global basis (Christensen et al., 2002). While working together, they are developing new services and products, which is crucial if cluster members plan to stay globally competitive.

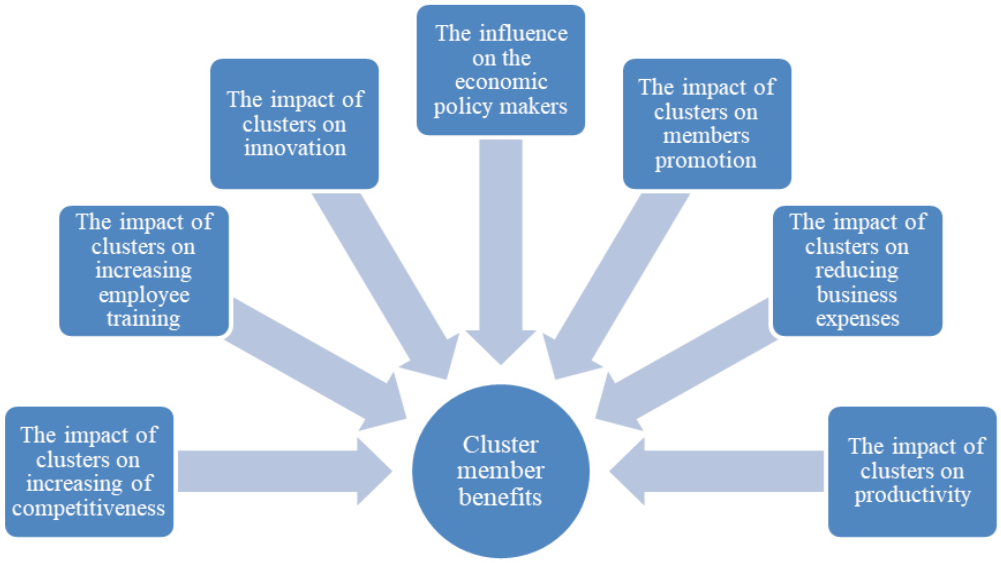
There are many benefits of clustering, it leads to productivity growth, increased competitiveness, innovation boost, and local growth and regional development (Michael, 2003, 2004) According to the definition proposed by Bianci (2005), clusters are resulted by itself. Clusters contribute to internationalization, better technology use, the introduction of quality standards, having more qualified employees and mobility of investment. The main goal of clustering is increasing the competitiveness of cluster members and the cluster itself. Small and medium-sized enterprises join together to become a more significant partner to large businesses and more competitive in the global market. Some authors (Parausić, Domazet, 2018) point out that there are four important keys for growth and prosperity of the national economies: (1) Specialized knowledge; (2) Innovations; (3) Technology; and (4) Science. They observe clusters as an engine starting device of economic growth and investments. In their words, clusters represent a strong catalyst for innovation processes.

A very important benefit of clustering is knowledge transfer (Argote, Ingram, 2000). They consider knowledge transfer as the process through which one member of a cluster learns from the experience of another member. Transfer knowledge can be both one-way and multi-way process because even the smallest or the least experienced cluster member could possess some knowledge that is important to other cluster members but they are unfamiliar to it. Clusters became more popular and its usage spreads to different areas.

Clusters are very important for agriculture (Paraušić et al., 2013), sport (Gerke et al., 2018), tourism (Nordin, 2003; Fundeanu, 2015) and the development of modern technologies led to forming of E-clusters (Davidović, 2014). Paraušić and Domazet (2018) point out that countries with highly developed clusters simultaneously have high national innovation potential and inversely. These authors made a statement that developing clusters is a key factor of competitiveness and sustainable development of each economy. Anderson et al.. (1994) underlined that the principle of work is simple: build an effective network of relationships with major stakeholders and profit will not be missed (Kotler, Keller, 2006). Some of the benefits of clustering are shown in Figure 1.

For authors of this paper, clusters consist of more different stakeholders, including representatives of the public, private sector and non-governmental sector, individuals and other interested parties. All stakeholders are operating inside a cluster domain or supporting industry.

Figure 1. Benefits of cluster members



Source: Authors

The goal of the clustering formation is to improve business, extend collaboration with large enterprises and increase competitiveness locally and globally. While working to achieve the aim of clustering, cluster members carry out their regular activities, cooperate with each other and with partners, but also work on mutual knowledge sharing. Also, implementing effective leadership is extremely important to optimize the business process. Implementing effective leadership implies benefits for cluster members and they will operate effectively.

About tourism clusters

Tourism consists of various activities that lead to local development, increasing employees, creating new jobs and stimulating investments. All mentioned creates possibilities for establishing new organizations, such as small and medium-sized enterprises (da Cunha, da Cunha 2005, 48). Hotel business, transportation, souvenirs, and other products for tourists are also an important segment of the sphere of tourism (Sahakyan, Suvaryan, 2018).

Importance of tourism is reflected in its connection to other industries, such as transportation, culture, health industry, politics, etc (Cvijanović et al., 2016). These industries can be observed as supporting industries to tourism.

Modern tourism is dominated by requests for tailored experiences and that gives small and medium-sized enterprises a great opportunity to play a key role in providing adequate products and services to tourists. They are responding to their most specific

interests and needs (Novelli et al., 2006) and some authors (Erkkila, 2004, p. 23) state that they constitute the *lifeblood of the travel and tourism industry worldwide*.

Tourism is generally considered in scientific literature as an industry that has a significant effect on the economic, social and functional structure of rural areas and as an essential factor in the revitalization and diversification of rural economy (Ristić et al., 2016). Michael (2003, 2004) analyzed the structure and the scale of clusters, especially when applied to the tourism context.

Tourism has frequently been launched as an alternative which potentially can contribute to a more positive development that attracts visitors, in-migrants, and investment, thus creating new employment and income opportunities in rural areas (Cawley, 2011; Halseth et al., 2010; Asa et al., 2016).

Role and impact of tourism in local growth and regional development have been tried to be explained through using networking, clustering and agglomeration theories. Knoke and Kuklinski (1983, p. 12) describe networks as *a specific type of relation linking a set of persons, objects or events*.

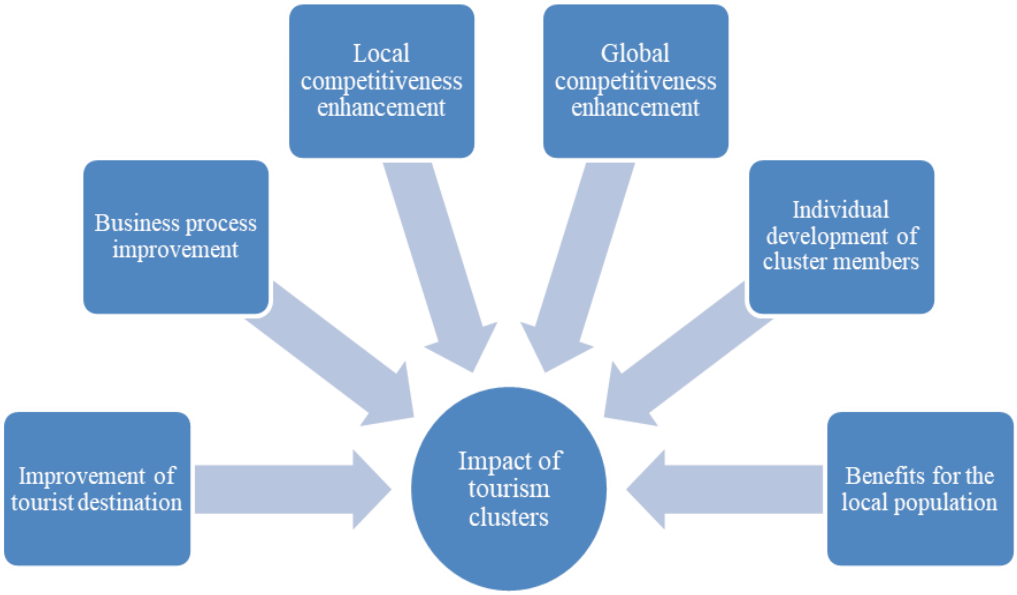
Kachniewska (2013) defined tourism clusters as an active network of tourism products manufacturers, supporting enterprisers of other industries, tourism organizations, local authorities and the local governments, facilities of business environment, educational and expert institutions, working together under a particular of a tourist product, and at the same time competing with each other in terms of the quality, innovation, and uniqueness of the offered services. Lately, more researchers use the cluster concept regarding tourism to promote competitiveness and innovation (Nordin, 2003; Fundeanu, 2015).

In a typical tourism cluster, the experience of tourist is affected not only by the attraction of the primary attractions, such as beaches or historical locality but also on the quality and effectiveness of the complementary businesses: hotels, restaurants, trade distributors and transport facilities. Lazzaretti and Kapone (2004) point out that cluster members are interdependent, so the good performance of one cluster member can enhance the success of the other. Tourism clusters are the result of complementary business organizations that may not necessarily be part of the same sector, but they benefit from network membership and linkage dynamics (Novelli et al., 2006). Inkpen and Tsang (2005) stated that cluster members are provided with access to knowledge, resources, markets, or technologies. This network can operate as a strategic alliance if the cluster members enter into a voluntary arrangement of exchanging, sharing or co-developing products or services (Gulati, 1998).

Skowronek (2015) observe tourism clusters are as group consisted of different organizations, suppliers and service providers or businesses operating in the tourism sector or institutions connected to them, all set in the same geographical area. All cluster members at the same time compete and cooperate with each other (Beni, 2003). Staszewska (2009) highlighted three important parts as a driving force of the cluster: (1) Private sector; (2) Public sector; and (3) R&D sector.

Accordingly to the observation of clusters expressed in this paper, for authors of this paper, defining tourism clusters should be approached in the following manner: Tourism clusters are formal or informal networks which are consisted of different stakeholders, such as representatives of the public, private sector and non-governmental sector, individuals and other interested parties. All cluster members are operating within the domain of tourism or supporting industry. The aim of the tourism cluster is creating benefits of all cluster members and their direct and indirect partners in the process. Creating tourism clusters can make a great impact, as presented in Figure 2. Clustering leads to the improvement of tourist destination, and for the members of tourism clusters, it implies business process improvement, local and global competitiveness enhancement and individual development of cluster members, because of the experience and knowledge sharing. There are also indirect benefits for the local population because of the improvement of tourism in their geographical area.

Figure 2. Impact of tourism cluster members



Source: Authors

Comparative analysis of tourism clusters models

Authors of this paper conducted a comparative analysis of tourism clusters in Europe to bring elaborate the role and the potential of tourism clusters and propose the most suitable tourism cluster model for Serbia. In the last two decades, many authors proposed their models of the tourism cluster. Some authors (Ritchie, Crouch, 2000; Kim, Wicks, 2010) developed their models of a tourism cluster based on the characteristics of the Porter diamond model. The peculiarity of the tourism cluster model proposed by

Ritchie and Crouch (2000) is a transition from the traditional approach which is based on the attractiveness of tourist destination to the competitiveness of the destination. They identify four main components which determine the competitiveness of tourist destination: (1) Determining factors (location, safety, cost); (2) Destination management (administration, marketing, management, information services); (3) Basic resources and attractions (geographic location, culture, history, activities, special events); and (4) Supporting factors and resources (infrastructure, accessibility, resources, support).

The model that is developed by Kim and Wicks (2010) underlined four factors of the tourism cluster: (1) Key resources and attractions; (2) Management of the tourist destination; (3) Additional conditions; and (4) Demand conditions.

Da Cunha and da Cunha (2005) offered a model of the tourism cluster that highlights creating sustainable development based on cultural, institutional, social and environmental sustainability. It represents the levels of tourism cluster competitiveness: (1) Meta level; (2) Macro level; (3) Meso level; and (4) Micro level.

Ferreira and Estevão (2009) introduced the model of the tourism cluster in which the effectiveness of the tourist destination depends on the level of destination management, information services, promotional activities, hospitality and staff attitude. They underlined tour product, tourist destination and tourism cluster as three main components of the tourism cluster.

If a tourism cluster model is observed in a sense of a cluster broker, we are talking about the Danish model. This model recognized local governments, regional development agencies and chambers of commerce as cluster brokers, because of their experience regarding strategy management and finding the ways for improvement (investors, grants, marketing activities). This experience was also used in Poland. Tourism clusters are coordinated by tourism organizations, which also provide consulting activities, audit and promotion. Fundeanu (2015) analyzed in his paper using the same cluster model in the South-Western region of Oltenia in Romania. This cluster is called "Oltenia Tourism Competitiveness Pole-Innovation and Tradition in Tourism" and it represents a good example of cooperation between the public and private sectors, including chambers of commerce, schools, relevant associations and travel companies.

Novelli et al. (2006) researched recognition of cluster development in the United Kingdom as a key factor in the promotion of economic innovation and the success of small and medium-sized enterprises. In their words, clusters are important for the creation of conditions that encourage the development and progress of the business.

Capone (2016) shared his findings on analyzing tourism clusters in Western Europe. According to his research, there are approximately thirteen clusters that include one thousand of more firms and they are located in capital cities or popular tourist destination, such as Paris, Madrid, London, Barcelona, etc. In Europe, 392 clusters include more than one hundred firms and 471 consists of fifty to one hundred enterprises. Some authors (Babalola et al., 2011) indicate that in the tourism industry in Italy small and

medium-sized enterprises predominate and that only about 3% of businesses consist of one thousand or more employees. The cooperation of local authorities and business in Italy are mostly underdeveloped. Although tourism clusters are still emerging, Italy is one of the leaders of international tourism.

"Innovative policy of Zhilina" is a project that is a part of the Regional Innovation Strategy of the Zilina region, started in 2005 and coordinated by the administration of the Zilina region on the North-West of Slovakia and the local university and other interested organizations. Project "Clusters and partnership" is also part of this strategy (Szekely, 2010).

Conducted analysis showed that a unique model of a tourism cluster must be developed for each geographic area. Tourism clusters can be formed at five different levels, micro, regional, pan-regional, national and international. Tourism clusters at the micro level include cluster members from one relatively small, homogeneous environment. Regional tourism clusters are formed on the territory of one municipality, city or region. These clusters consist of members that are from heterogeneous areas with different geographical or other features. Pan-regional tourism clusters are formed because two or more regions share some mutual characteristic. For example, it can be a larger area that consists of several regions, but there are one or more attributes that they share. National tourism clusters are self-explanatory. They represent tourism clusters formed on the ground on one country and if cluster members are from two or more countries, we are considering pan-national tourism clusters.

Conducted analysis showed that tourism clusters can seem similar, but every cluster has its specificities which make it unique. Tourism policymakers should have that in mind while working on tourism cluster forming.

Tourism clusters in Serbia

There are numerous cluster initiatives in Serbia, but it is hard to determine the exact number because there is not a unique database or cluster register (Vukotić et al., 2014). Additionally, not all clusters are formally registered. There are many clusters legally registered in Serbia, but they are underdeveloped and not operative in practice, or they are starting developing with untrusting cooperation between participants (Mijačić, 2011; Paraušić et al., 2013; Paraušić, Cvijanović, 2014). Clusters are a way of improving innovation potential in the Serbian economy (Paraušić, Domazet, 2018). Pandurević (2012) concluded that the results of policy implementation based on clusters do not correspond with the expectations and potential for cluster-related economic development. In the research of Aničić et al. (2013), it cen be see that development of clusters in Serbia began in 2004 through the mobilization of interested parties and improving capacities on the national level, firstly ministry responsible for tourism. Strengthening of business infrastructure is embedded in many strategic documents of the Government of the Republic of Serbia and acts of local self-governments. The cluster development process is assisted also by international organizations and

programs. Their analysis also showed that the development level of clusters in Serbia is still unnoticed.

In 2019, the National Assembly of the Republic of Serbia passed a new Law on Tourism and content related to tourism clusters stayed unchanged compared to Law on Tourism from 2009. Forming of tourism clusters are elaborated in the Strategy for Tourism Development from 2006 to 2015. According to that Strategy, there are four tourism clusters: (1) Vojvodina; (2) Belgrade; (3) Western Serbia with Kosovo and Metohija; and (4) Eastern Serbia. These four clusters were only formally proposed and they never implemented completely. New Strategy for Tourism Development adopted in 2016 does not have a division into four tourism clusters and event do not mention the word "cluster" at all. In practice, despite having proposed tourism clusters from 2006 to 2015, many independent tourism clusters are formed, as shown in Table 1.

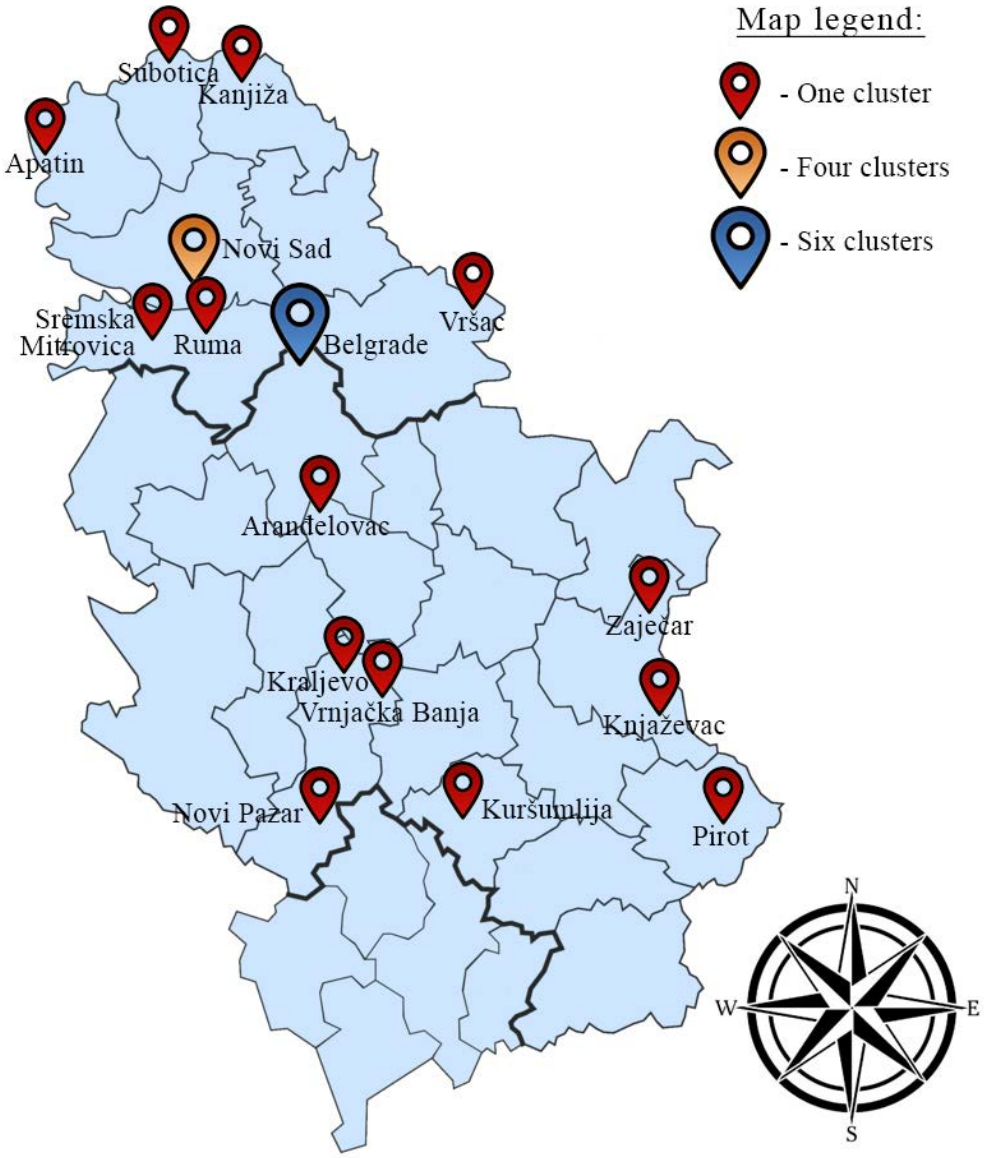
Table 1. List of tourism clusters in Serbia

Nr	Tourism cluster	Year of establishment
1.	Fond health tourism cluster of Vojvodina, Kanjiža	2007
2.	Fond tourism cluster of micro region Subotica - Palić	2007[1]
3.	Danube tourism cluster "ISTAR 21", Novi Sad	2008
4.	Association for development of business and manifestation tourism	2008
5.	Tourism cluster of Kraljevo "Kraljevski odmor"	2008
6.	Organization for hotel industry and gastronomy development HGS	2008
7.	Cluster of medicine tourism	2009
8.	Cluster of tourism micro region of Sremska Mitrovica, Sveti Dimitrije	2009
9.	Fond tourism cluster Srem	2009
10.	Tourism cluster of South-East Serbia, Stara planina – Knjaževac	2010
11.	Cluster of medicine and health tourism – Vrnjačka Banja	2011
12.	Tourism initiative Tronožac, TTI	2011
13.	Cluster of rural tourism, Čarolija istoka	2011
14.	Tourism cluster of micro region Apatin	2011
15.	Cluster for development of business manifestation tourism	2012
16.	Banat tourism cluster	2012
17.	Cluster of health, wellness and spa tourism	2012
18.	Cluster for developing of rural tourism in Vojvodina	2012
19.	Tourism business cluster of Savski venac "Venac dobre usluge"	2012
20.	Tourism cluster of Radan area	2012
21.	Tourism cluster Avala	2013
22.	Cluster of travel agencies and hoteliers of Sandžak	2013
23.	Cluster educational tourism of Serbia	2013
24.	Tourism cluster "Srce Šumadije" – Aranđelovac	2014

Source: Authors

Examining data from Table 1, it can be seen that most tourism clusters are founded in 2012, six of them, and then 2008 and 2011 with four formed tourism clusters. The regional layout of the tourism clusters in Serbia is shown in the following map in Figure 3.

Figure 3. Tourism clusters in Serbia



Source: Authors

Authors analyzed twenty-four tourism clusters that can be found. Examining cluster locations in Serbia on Figure 1, authors realized that the most clusters are formed in the Capital city of The Republic of Serbia, Belgrade, six of them. There are four tourism clusters in Novi Sad and other clusters are located in other cities or districts. District with the most clusters is Raška district with three formed tourism clusters (Kraljevo, Vrnjačka Banja and Novi Pazar).

Two clusters are formed in Srem district (Ruma and Sremska Mitrovica) and Zaječar district (Zaječar and Knjaževac). Following micro-regions, municipalities or cities are the only tourism cluster representatives for their districts and have one formed tourism cluster: Subotica-Palić micro-region, Apatin, Kanjiža, Vršac, Aranđelovac, Pirot, and Kuršumlija.

Many municipalities, cities, and districts in Serbia have great tourism potential, but they do not have formed tourism clusters, as shown in Figure 1. Decision-makers should further examine existing cluster locations and propose forming of new tourism clusters in the areas with tourism potential, such as rural tourism, where tourism clusters do not exist.

Concept authors proposed was the guidance for proposal tourism cluster model for Serbia. The ideal model for Serbia would be a tourism cluster at the micro level because large clusters proposed in Strategy for Tourism Development from 2006 were not implemented as planned. Tourism policymakers have to include all stakeholders in the clustering process, representatives of the public, private sector and non-governmental sector, individuals and other interested parties operating in tourism or supporting industry.

Conclusion

The objective of this paper was to examine the theoretical approach to clustering, with special reference to tourism clusters. Results of this paper research have theoretical and practical value.

Tourists are becoming more demanding due to the variety of tourist destination. To respond to their needs and requests, organizations working in tourism sphere have to achieve an optimal level of their business process. Many organizations choose to form wide networks with other tourism stakeholders and create clusters.

Contribution of this paper to science is through understanding and advancing significant issues regarding the impact of business clusters on tourism. Authors identified different direct benefits for all cluster members and indirect impact on the local community. Conducted a comprehensive analysis of various tourism cluster models showed that a unique model must be developed for each region or country. Tourism policymakers should first examine the current situation and based on the environmental characteristics determine the well-defined cluster model which will be used in that region only. Cluster model proposed for one geographical area could be replicated in other locations with similar needs or characteristics, but this research recommended creating new models concerning the specificities of that location.

In practice, findings of this research could give tourism policymakers, decision-makers and researchers in the tourism sphere guidelines regarding business clusters. Forming tourism clusters as the widest functional-market and spatial units of Serbian tourism would lead to achieving the simplification of regional tourism brands and emphasize well-known geographical concepts, differentiated positioning of clusters in the market, improving the attractiveness, marketing, productivity, and destination management. Implementing a clustering strategy would benefit all stakeholders and make a greater impact.

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Conflict of interests

The authors declare no conflict of interest.

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CONTEMPORARY BASIS OF RURAL TOURISM DEVELOPMENT IN ŠUMADIJA DISTRICT

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ABSTRACT

This paper aims at showing that the regionalization, innovations, smart specialization and sustainable tourism development like contemporary basis of rural tourism development can significantly contribute to increasing the competitiveness of both of the whole region and all its parts, and hence rural ones. We used several methods such as literature analysis and empirical research based on the questionnaires distributed to the stakeholders in the tourism of the Šumadija District. Our conclusion is that there is a positive attitude among the stakeholders towards creating a tourism region in the Šumadija District based on innovations, smart specialization and sustainable development. We also claim that rural tourism is a priority and that the stakeholders in the Šumadija District should focus on this type of tourism.

Introduction

Rural areas are usually less developed than urban ones and do not have a sufficient number of attraction, adequate infrastructure and suprastructure to attract more tourists. In practice, there are numerous examples of rural areas, where material position of population is improved by the development of rural tourism (Mariel and Sâncraiu in Romania, family farms in Finland and Poland, Latkovac, Kosjerić in Serbia) (Podovac, et al., 2019). In order to increase tourism traffic in rural areas, it is necessary to create regional tourist destinations where the development of tourism in the regional center would also encourage the development of rural tourism. In addition, innovations and modern information and communication technology (ICT) need to be applied, but also

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the principle of sustainable development in view of the deterioration of the natural environment, as a basis for the development of tourism in the rural area. Đenadić et al. (2016) pointed out that the main strategic goals of the Serbian tourism in rural areas should be competitiveness in international market, balanced regional development, self-employment and motivating young people to stay in the countryside, permanent protection, implementing and maintaining high environmental standards, for the sake of long-term sustainable valorization of tourism potential of rural areas.

The aim of this paper is to analyze the basis for the development of rural tourism in the Šumadija district, based on regionalization, innovation, smart specialization and sustainable development. For the purpose of such an analysis, we conducted a survey of key stakeholders in the tourism of Šumadija in order to get answers to the questions how important each of the above bases is and can contribute to competitiveness of both of the whole region and all its parts, and hence rural ones. For this analysis, we will give an overview of literature, and then provide an analysis of empirical research.

Context of the study

Regionalization became the focus of research in the last two decades of the XX century, especially in the European Union. According to various theoreticians (Council of Europe and prof. Gerard; 1998; Söderbaum, 2003*;* Yoder, 2003; Schrijver, 2005), we may say that regionalization is a process of creating a new level in a state territorial organization, bridging national and local, establishing institutions with different degrees of responsibilities and authorities, and leading to the decentralized authority, with the aim of providing a better service with the citizens in the region.

Dawkins (2003) analyzes different theories of regional development and concludes that several factors affect the development of a region: specialization in goods that require the intensive use of that factor abundant in a region (Neoclassical trade theorists), firms will tend to locate near markets when the monetary weight of the final product exceeds the monetary weight of the inputs required to produce that product (Location theory), number and scale economies and transportation costs to markets (external economies model), proximity of a given distribution point (Models of spatial competition), combined influence of scale economies and transportation costs to markets (Central place theory), response to exogenous world demand (Export Base Theory), savings rates, population growth rates, and technological progress parameters determined outside (Neoclassical Exogenous Growth Theory), growth in developed regions through "spread" effects resulting from the diffusion of innovations into a "lagging" region (Cumulative Causation Theory), linkages between firms and industries (Growth Pole Theory) etc. Hadjimichalis and Hudson (2014) criticize neoclassical model of regional development, stating that it is based on depolitization and leads to privileges of particular socio-spatial class interests and ignores others, focuses exclusively on a few successful "super-star" regions and cities, neglects all other "ordinary" places, and bases their explanation of success mainly on internal, endogenous factors within the region, ignoring exogenous forces. These approaches ignore the regulatory role of the national

state and EU institutions. Higgins and Savoie (2009) criticize both neoclassical and Marxist school theories stating that all scoieties live in particular places, cultures are defined in terms of space, these spaces are almost always smaller geographically than nation-state, in most countries, there are sharply differing or even conflicting interests among various societies occupying various spaces within them, economic and social interests of particular societies in particular spaces are closely tied to the dominance of particular sector of economic activity and the consequent structure of the economy and the society, people do develop strong loyalities and attachment to spaces, most people do not think of "welfare" in terms of nation states, market in fact does not work well, there is limited sense in which there is "harmony of interests" in national economy and national society etc.

Under the tourist region we imply such a spatial unit in which tourism is one of the dominant or unifying functions, while physiognomy is largely a consequence of this function (Vasović and Jovičić, 1982, pp. 12).

As for the innovations, we have to admit that various authors (Decelle, 2006; Weiermair, 2006; Hjalager, 2010; Camisón, Monfort-Mir, 2012; Carlisle, et al., 2013, Divisekera, Nguyen 2018; Hjalager, Madsen, 2018) refer to Schumpeter (1949, pp. 66), who defines innovation as presenting a new product or a production method, creating a new market or material sources, or creating new organizational structures in the industry. Hjalager and Madsen (2018) also relies on Schumpeter's deffinition, but add that innovation in tourism entails product and service, process, marketing, organizational, distribution and delivery and institutional innovations. Innovation in sustainable tourism could include aspects of visitor management, new accommodation forms and hospitality management developments, tourism's connections to conservation and protected areas, and the concept of slow tourism (Bramwell, & Lane, 2012). Based on the views of various authors (Foray et al., 2011; European Commission, 2012, pp. 8; Charles et al., 2012; Landabaso, 2014; Foray, 2018; Hassink, & Gong, 2019), it can be noted that smart specialization represents the focus of a particular country or region on resources that can provide sustainable innovation, research and development and ICT based competitiveness as key elements for supporting priority sectors.

Today, tourism encompasses new cultural values that are focused on the sustainable development and preservation of the environment at the international level (Redžić, 2019). Based on the definitions given in many documents and scientific papers (Bramwell, & Lane, 1993; Liu, 2003; Middleton and Hawkins, 2011), we can conclude that the sustainable development of tourism means development with the concern for the preservation of the environment and resources to be exploited by future generations and minimizing the harmful effects of tourism development to the least extent possible.

We considered all these categories as the basis for increasing the competitiveness of tourist destinations. Ritchie and Crouch (2003. pp. 2) have defined the competitiveness of a tourist destination as a ability to increase tourism expenditure, to increasingly attract visitors while providing them with satisfying, memorable experiences, and to

do so in a profitable way, while enhancing the well-being of destination residents and preserving the natural capital of the destination for future generations.

Different authors have expressed opinions in many scientific papers regarding the territorial coverage of Šumadija as the central region of the Republic of Serbia, which is also characteristic for legal and strategic documents. Cvijić (1966) considered that Šumadija ranges from Kopaonik and Jastrebac in the south, to the Sava and the Danube in the north, the Kolubara and Drina in the west and the Mlava and Pek in the east. According to Jovičić (1994), the Western Morava is the southern border of Šumadija, the Great Morava is the east, and the Kolubara with Suvobor its west border. *The Spatial Plan of the Republic of Serbia* from 1996 and the *Spatial Development Strategy of the Republic of Serbia 2009 - 2012 - 2020* have stipulated that Kragujevac is a macro-regional center or functional urban area - FUA that will connect all municipalities of the Šumadija district (except Arandjelovac). According to *the Regional Spatial Plan for the area of the Šumadija, Pomoravlje, Raška and Rasina administrative district* (2014), a map referring to tourism and protection of the area is given, where the so-called Šumadija tourist belt is defined - Arandjelovac, Topola, Kragujevac. In the above document, the FUA were also provided, and one of them is Kragujevac, which connects the municipalities of Knić, Batočina and Rača.

In the research done by Živanović and Djordjevic (2012), based on three criteria for defining functional urban areas such as daily migration (examination of the work center determined by the influence of the functions of the centers of work on the daily mobility of the population), temporal isochrone (30 minutes or 45 minutes isochrone of the urban center is one of the ways of determining the boundaries of its gravitational field, that is, the sphere in which its effects are the most significant) and spatial continuity, there has come to the conclusion that in the FUA Kragujevac, besides all the settlements of that municipality, the entire municipality of Batočina and almost Knić is included, while the surrounding municipalities with only a small number of settlements are included in the territorial coverage of the defined FUA. The Šumadija district is administratively encircled by the Decree on Administrative Districts and consists of the City of Kragujevac and 6 municipalities: Aranđelovac, Topola, Batočina, Lapovo, Knić and Rača (*Decree on administrative districts*, 15/2006).

In the *Tourism strategy of the Republic of Serbia, 2005*, it is envisaged that the Šumadija district should be a part of the Southwest Cluster, as one of the four clusters within the Republic of Serbia. It is noted that the key tourist products of this cluster are events, mountains and lakes, health and rural tourism (*Tourism strategy of the Republic of Serbia, 2005, pp. 148*). In the *Tourism Development Strategy of the City of Kragujevac 2015-2020*, in the segment discussing aspects of tourism on the territory of the city, there are circular tours that include destinations such as Knić, Rača, Topola, Batočina, Lapovo, Rekovac and Despotovac. This tells us that the stakeholders in the tourism of the City of Kragujevac are aware that the tourist offer should be expanded also by the attractions from the surrounding municipalities belonging to the Šumadija and Pomoravlje district.

Possibilities for development of different forms of tourism in the rural areas of the Šumadija district

Rural tourism represents a complex multidimensional activity, which includes farm holidays, but also includes breaks related to special interests in nature, ecotourism, hiking, climbing and riding, adventures, sports and health tourism, hunting and fishing, educational trips, art and heritage tourism, and also ethnic tourism in some areas (Lane, 1994). Roberts and Hall (2001, pp. 15) state the following tourism forms regarding rural areas: agrotourism, farm toruism, wilderness and forest tourism, green tourism, ecotourism. We can conclude that various tourism types can be linked to rural tourism:

- Cultural tourism involves the movement of people essentially from cultural motifs such as study trips, artistic performance and other cultural tours, travel to the festival and other cultural events, visits to places and monuments, travel for the study of nature, folklore, art, or pilgrimage (Sigala, & Leslie, 2005, pp. 7) and MacDonald and Jolliffe (2003) define cultural rural tourism as a distinct rural community with its own traditions, heritage, arts, lifestyles, places, and values as preserved between generations.

- Gastronomy - promoting culinary tourism in agri-tourism represents a winning strategy for the development of the whole economy of rural areas (Testa, et al.. 2019),

- Ecotourism, as part of the tourist offer of rural areas, implies responsible travel to natural areas where the environment is protected, improves the well-being of the local population and includes interpretation and education (https://ecotourism.org/what-is-ecotourism/),

- Wine tourism can be defined as a visit to vineyards, wineries, wine festivals and wine exhibitions, where wine tasting and/or experiences related to the characteristics of wine regions are the main motivational factor for visitors (Hall, 1996).

- Tourism of special interest includes tourist trips motivated by special interests for particular attractions and activities, such as: sports, untouched nature, traditional crafts, wellness, culture, rural tourism, events, festivals, nautics etc. (Jovanović, 2013, pp. 1).

- Religious tourism is special tourist activity oriented by religious culture, with the help of specific ecocultural environment and it refers to such special touristic activities as worshipping, research, sightseeing, and culture which stimulate travel by both religious followers and lay tourists (Mu. et al, 2007).

In the rural area of the Šumadija district there are many tourist attractions that can represent the unique tourism product of the tourist region Šumadija, which is the basis for the development of rural tourism. The municipalities that are distinguished by the development of rural tourism in the Šumadija district are Knić (villages Borač, Žunje, Grabovac, Čestin etc.), Aranđelovac (villages Garaši, Vrbica, Orašac), but also villages in the vicinity of Kragujevac (Stragari, Vlakča, Čumić, Dulene, Veliki Šenj, Kutlovo, Masloševo etc.) (http://gtokg.org.rs/srb/seoski-turizam-sela/) and Topola (the foothill of Rudnik). Dimitrovski et al. (2012), having examined the providers of tourism services

in Gruža (the Municipality of Knić), concluded that they agreed that rural tourism increases the income to the village, reduces migration to cities, increases employment in villages, increases the production of organic food, contributes to the cultural life of the countryside, as well as national and cultural identity.

Many cultural and historic tourist attractions are located in the rural area of Šumadija District. It is known that the First Serbian uprising started in Orašac (near Arandjelovac) and it can be said that this is the place of the cradle of the modern Serbian state, in the village of Viševac (the municipality of Rača) there is a memorial complex dedicated to Karadjordje, since he was born there; in the municipalities Knić and Kragujevac are the ruins of several medieval towns (Borač and Srebrnica), in the village of Gradac (in the municipality of Batočina) there are remains of a medieval town and an archaeological site where bones of extinct animals (mammoths), parts of human fossils were found, and also on that locality also there is a cave that testifies to the culture of the primitive man, as well as the necropolis with the graves from the Roman times (*Sustainable Development Strategy of Batočiina Municipality 2017-2022,* pp. 8). In the municipality of Rača a log cabin church stands out (proclaimed a cultural monument of special importance), the Turkish dormitory and the house of the Duke of Pavle Cukić (Miličević et al., 2015).

The gastronomic offer in many rural tourism capacities in Šumadija plays an important role in attracting tourists and is part of the cultural identity of this part Serbia. In many rural areas, there are many events that complement the tourist offer of the villages of Šumadija.

In Šumadija, a great number of locations and destinations can be suitable for ecotourism. First of all, in the municipality of Knić (Borački Karst and the surroundings of Gruža Lake) in the municipality of Arandjelovac (Bukulja and Venčac) and in the vicinity of Kragujevac (surroundings of Stragar).

Topola and Arandjelovac are located on the Serbian wine route. In Topola, the most important wine tourism capacities are the Royal Winery (the endowment of King Petar from 1930) and the Museum of Wine and Vineyards, PIC "Oplenac", Aleksandrović and Arsenijević winery in the village of Vinča (near Topola) and winery from the village Lipovac "Rogan" and "Delena" (https://topolaoplenac.org.rs/oplenacki-put-vina/). In the Municipality of Arandjelovac, from the capacity of wine tourism, we can list "Wine cellar Grb "and" Wine cellar Vrbica" in the village of the same name (https://www.putvinasrbije.rs/put-vina-srbije-sumadija/).

In the Šumadija district there are several locations suitable for the development of fishing tourism, such as Lake Gružan in the municipality of Knić, the Great Morava, flowing through the municipalities of Batočina and Lapovo, Šumarice Lake and Grošnica Lake near Kragujevac and Garaš Lake near Arandjelovac. As for hunting tourism, there are a number of hunting sites and hunting associations in the Šumadija district that could contribute to the development of this type of tourism, such as the "Gruža" hunting ground in the Knić municipality, "Šumadija" and "Lepenica" near Kragujevac (http://gtokg.org.rs/srb/lov-i-ribolov/), "Srebrnica" near Stragari, "Jelen" and "Karađorđe"

near Topola (https://topolaoplenac.org.rs/lovni-turizam/), "Rogot" in the municipality of Batočina (*Sustainable Development Strategy of Batočiina Municipality 2017-2022,* pp. 69), "Gradište" near Rača which manages the Bukovac hunting ground (http://tor.rs/sr/lovni-turizam/) and "Bukulja" near Arandjelovac (*Sustainable Development Strategy of Aranđelovac Municipality 2016-2021. year, pp. 93*).

Many mountains in the Šumadija district can serve for the purpose of sports and tourism of special interests such as Rudnik, Bukulja and Venčac, Gledić mountains and Kotlenik.

In Knić municipality on Gruža Lake there are possibilities for sport and recreation, such as rowing (arranged rowing trails and infrastructure for accessing the lake and hangar for sporting equipment) (*Sustainable Development Strategy of Knić Municipality 2010 - 2020. year*, pp. 31), trekking, hiking etc. In all other municipalities, there are a large number of promenades, parks, sports facilities and centers that offer tourists the opportunity to engage in sports and recreation.

Today, religious tourism is closely linked to leisure and cultural tourism (Rinschede, 1992). There are a large number of monasteries and churches in the rural area of Šumadija district (Petkovica, Voljavča, Blagovestenje near Stragar, Divostin and Drača in the villages with the same name, Raletnac, Denkovac and Sarinac in the village of Velike Pčelice, Nikolje in the village of Donja Šatornja, Brezovac in the village of the same name etc.) providing basis for the development of religious tourism.

Materials and methods

Research on the development of tourism in the rural area of the Šumadija district based on regionalization, innovation, smart specialization and sustainable development is based on surveying stakeholders who are directly or indirectly related to tourism: employees in tourist organizations in all municipalities of the Šumadija district, employees in catering (hotels, hostels, villas, restaurants), academic public (university professors and students of doctoral studies at higher education institutions - Faculty of Economics Kragujevac, Faculty of Tourism and Hotel Management in Vrnjačka Banja, and Arandjelovac High School of Vocational Studies), as well as employees in travel agencies. The survey was conducted in the period from September 2018 to January 2019, and the SPSS 19 program was used for the processing of statistical data. Our research has been conducted as internet survey and printed questionnaires distributed to the stakeholders via email or directly.

The questionnaire for the mentioned stakeholders consisted of 6 parts. The first part refers to the general data on the sample (gender, age, education, representative of different groups of stakeholders), the second part covering 5 questions (claims) refers to regionalization in tourism, the third group consists of six questions on competitiveness, fourth group consists ICT-related issues as the basis for innovation and smart specialization, the fifth group consists claims relating to sustainable development and the sixth group are claims referring to tourism specialization. To examine the different stakeholders and their views on all of the above-mentioned groups of questions (except

for general information about respondents), we used the five-level Likert Scale, where respondents had the opportunity to circle only one of the offered assessments. The survey included basic statistical analyzes of frequency, mean and standard deviation (descriptive statistics) in order to see the attitude of stakeholders regarding the development of tourism in the rural area of the Šumadija district based regionalization, innovation, sustainable development and smart specialization.

After the basic statistic analysis, the ANOVA test (univariate variance analysis) was applied to determine the significance of the differences between several dependent variables and an independent variable, with the independent variables being the four aforementioned groups of respondents, while the dependent were the stated claims (questions).

Following these analyzes, a factorial analysis was also carried out in the SPSS to define a smaller number of groups of factors and see how each of these groups explains the variance. Based on factorial analysis, we have identified how stakeholders are interested in issues of regionalization, competitiveness, innovation, sustainable development and specialization in tourism, and which of these areas is considered a priority for the development of tourism in Šumadija region. Particular attention was paid to the level of prioritization of different types of tourism characteristic of rural areas (rural tourism, tourism of special interests, cultural tourism), as well as the importance of sustainable development of tourism as a basis for the development of this type of industry in the rural area. A total of 145 respondents were interviewed in total.

Results and discussion

Based on the research we obtained data related to descriptive statistics. After that, we conducted the ANOVA test. First, we examined the homogeneity of the variance to see if the ANOVA test can be applied to the above claims. Based on the homogeneity test of the variance, three claims did not pass the test, and we proceeded to a more robust Welch equation test of arithmetic means. On the basis of this test, it was established that the claim relating to *built and cultural tourist attractions* is the only one that does not fulfill the test of equality of arithmetic means and a special post-hoc test will be performed for it.

Table. 1. Descriptive statistics and results of ANOVA test (Sig.)

No.	Claim (question)	N	M	SD	ANOVA (Sig.)
1	**Šumadija is a spatial entity with appropriate natural and created tourist values in which a unified regional tourist product can be formed.**	**145**	**4,23**	**0.808**	**0.029**
2	Destinations in Šumadija will be more competitive if they function as a special regional tourist destination (RTD).	145	3.77	1.118	0.250
3	The promotion of Šumadija's destinations and attractions would be more successful if Šumadija would be promoted as a special tourist region.	145	4,07	1,032	0.382

4	If Šumadija could be constituted as a separate tourist region, it would be easier to obtain the EU funds or other investments in tourism.	145	3.99	1.034	0.650
5	The Tourist Organization (TO) Kragujevac helps and promotes all other destinations in the Šumadija district	145	2.93	1.153	0.999
6	Natural tourist attractions (mountains, rivers, lakes, parks, and landscapes)**.**	**145**	**3.59**	**0.954**	**0.006**
7	**Built and cultural tourist attractions (museums, theaters, galleries, concerts, monuments, churches, monasteries, fairs and congresses facilities etc.)**	**145**	**3.41**	**1.083**	**0.029**
8	Quality of tourist facilities (hotels, hostels, restaurants, etc.).	**145**	**3.03**	**1.017**	**0.007**
9	Traffic infrastructure and availability of tourist attractions.	**145**	**2.59**	**1.103**	**0.012**
10	**The employees in the tourism and hospitality industry.**	**145**	**3.05**	**0.967**	**0.050**
11	**Competitiveness of prices in tourism.**	**145**	**3.23**	**0.979**	**0.034**
12	The information on the website of the Tourist Organization of the City of Kragujevac (gtokg.org.rs) is of help to tourists who visit this tourist region.	145	3.27	1.029	0.149
13	Information on the websites of other Tourism Organizations in Šumadija (Arandjelovac, Topola, Rača, Knić, Lapovo, Batočina) are of help to tourists who visit this tourist region.	145	2.98	0.982	0.202
14	Catering companies (hotels, hostels, restaurants, clubs) in Šumadija are present on relevant tourist sites (booking.com, www.tripadvisor.com, etc.).	145	3.24	0.974	0.066
15	Catering companies (hotels, hostels, restaurants, etc.) of Šumadija have good websites.	145	3.06	0.864	0.600
16	The presence of catering companies (hotels, hostels, restaurants, clubs) of Šumadija on key social networks is good and it helps to increase tourist traffic.	145	3.21	0.873	0.641
17	**Tourism in Šumadija contributes to the preservation of the environment.**	**145**	**2.66**	**0.966**	**0.003**
18	Tourism in Šumadija contributes to the development of the entire economy.	145	3.18	0.998	0.109
19	Tourism in Šumadija contributes to higher employment.	145	3.13	1.062	0.070
20	**Tourism in Šumadija contributes to a higher living standard of the population.**	**145**	**2.97**	**1.127**	**0.034**
21	**Tourism in Šumadija contributes to the preservation of social values and traditions.**	**145**	**3.62**	**0.986**	**0.008**
22	**New knowledge, technologies, skills and training are available to tourists in Šumadija.**	**145**	**2.94**	**1.022**	**0.022**
23	Business tourism (MICE).	145	3.63	1.026	0.323
24	Cultural tourism (monasteries, churches, historical sites, museums, exhibitions, etc.).	145	4.12	0.904	0.366
25	Rural tourism.	145	3.85	1.002	0.452
26	Health and wellness tourism (spa and healing tourism).	145	3.59	1.045	0.665
27	City-break tourism and events (festivals, circular tours, etc.).	145	3.78	0.946	0.070
28	Mountain, sport and tourism of special interests (hunting, fishing, recreation, wine tourism etc.).	145	3.94	0.963	0.726

N – number of stakeholders, M – Mean, SD – Std. Deviation
Source: Authors, based on research

The first thing we can conclude on the basis of the obtained results in the *Table 1.* is that the stakeholders who have been interviewed agree and support the idea of establishing Šumadija as a tourist region, because in the claim that Šumadija is a spatial entity with corresponding natural and created tourist values in which unified the regional tourism product mean (M = 4.23) is the highest in relation to all other claims. Further, claims related to the establishment of Šumadija as a tourist region have the highest means compared to all other claims.

The claims relating to competitiveness elements have relatively low means, suggesting that stakeholders consider the key competitiveness elements to be at a low level in the Šumadija district. The highest means have natural tourist attractions and the lowest the infrastructure. Claims related to ICT and Sustainable Development have relatively low means, and it is especially worrying that the claim that tourism in Šumadija contributes to the preservation of the environment has the lowest arithmetic mean of all other claims in the whole questionnaire. The views of stakeholders regarding tourism specialization show that cultural tourism, mountain, sports and tourism of special interest and rural tourism have the highest average ratings.

Based on the ANOVA test, we can conclude that in ten claims (questions) there is no agreement between the respondents. For these claims, we need to do additional post hoc LSD tests, to determine the exact group of respondents that has a difference in stances related to regionalization, competitiveness, ICT, sustainable development and specialization.

Table 2. Post hoc LSD test

Dependent Variable	(I) Representative	(J) Representative	Sig.
Šumadija is a spatial unit ... in which a unified regional tourism product can be formed.	Academic public	Employees in TO	0.036
	Academic public	Employees in HI	0.038
	Academic public	Employees in TA	0.004
Natural attractions (parks, rivers, lakes, mountains, climate).	Academic public	Employees in TO	0.009
	Academic public	Employees in HI	0.039
	Academic public	Employees in TA	0.001
Quality of facilities in tourism.	Employees in TA	Employees in TO	0.012
	Employees in TA	Employees in HI	0.001
	Employees in TA	Academic public	0.012
Traffic infrastructure.	Academic public	Employees in TO	0.28
	Academic public	Employees in HI	0.012
	Academic public	Employees in TA	0.003
The employees in the tourism and hospitality industry.	Employees in HI	Employees in TO	0.128
	Employees in HI	Academic public	0.128
	Employees in HI	Employees in TA	0.006
Competitiveness of prices in tourism.	Employees in TA	Employees in TO	0.053
	Employees in TA	Employees in HI	0.011
	Employees in TA	Academic public	0.013
Tourism in Šumadija contributes to the preservation of the environment.	Employees in HI	Employees in TO	0.024
	Employees in TA	Employees in TO	0.000
	Employees in TA	Academic public	0.040

Dependent Variable	(I) Representative	(J) Representative	Sig.
Tourism in Šumadija contributes to the greater living standard of the population	Academic public	Employees in TO	0.037
	Academic public	Employees in HI	0.042
	Academic public	Employees in TA	0.004
Tourism in Šumadija contributes to the preservation of social values and tradition.	Academic public	Employees in TO	0.032
	Academic public	Employees in HI	0.032
	Academic public	Employees in TA	0.001
New knowledge, technologies, skills and training are available to tourists in Šumadija.	Employees in TA	Employees in TO	0.022
	Employees in TA	Employees in HI	0.006
	Employees in TA	Academic public	0.015

Note: Employees in HI - Employees in the hospitality industry, Employed in TA - Employees in the Travel Agencies, Employed in TO - Employees in the Tourism Organisations

Source: Authors, based on research

We see in the previous table that the LSD test shows that there is a disagreement between the academic public and the other three stakeholder groups about the claim that *Šumadija is a spatial entity ... in which a unified regional tourism product can be formed*. However, in order to make the final conclusions we have to look at the data from descriptive ANOVA test statistics.

Table 3. Descriptive statistics – ANOVA test

Claims	Stakeholders	N	M
Šumadija is a spatial entity with appropriate natural and created tourist values in which a unified regional tourist product can be formed.	Employees in TO	30	4.17
	Employees in HI	47	4.21
	Academic public	30	4.60
	Employees in TA	38	4.03
	Total	145	4.23
Natural attractions (parks, rivers, lakes, mountains, climate).	Employees in TO	30	3.43
	Employees in HI	47	3.62
	Academic public	30	4.07
	Employees in TA	38	3.29
	Total	145	3.59
Quality of facilities in tourism.	Employees in TO	30	3.17
	Employees in HI	47	3.26
	Academic public	30	3.17
	Employees in TA	38	2.55
	Total	145	3.03
Traffic infrastructure.	Employees in TO	30	2.77
	Employees in HI	47	2.43
	Academic public	30	3.07
	Employees in TA	38	2.26
	Total	145	2.59

Claims	Stakeholders	N	M
The employees in the tourism and hospitality industry.	Employees in TO	30	3.00
	Employees in HI	47	3.34
	Academic public	30	3.00
	Employees in TA	38	2.76
	Total	145	3.05
Competitiveness of prices in tourism.	Employees in TO	30	3.30
	Employees in HI	47	3.38
	Academic public	30	3.43
	Employees in TA	38	2.84
	Total	145	3.23
Tourism in Šumadija contributes to the preservation of the environment.	Employees in TO	30	3.13
	Employees in HI	47	2.64
	Academic public	30	2.73
	Employees in TA	38	2.26
	Total	145	2.66
Tourism in Šumadija contributes to the greater living standard of the population	Employees in TO	30	2.87
	Employees in HI	47	2.94
	Academic public	30	3.47
	Employees in TA	38	2.68
	Total	145	2.97
Tourism in Šumadija contributes to the preservation of social values and tradition.	Employees in TO	30	3.57
	Employees in HI	47	3.62
	Academic public	30	4.10
	Employees in TA	38	3.29
	Total	145	3.62
New knowledge, technologies, skills and training are available to tourists in Šumadija.	Employees in TO	30	3.07
	Employees in HI	47	3.11
	Academic public	30	3.10
	Employees in TA	38	2.50
	Total	145	2.94

Employees in HI - Employees in the hospitality industry, Employed in TA - Employees in the Travel Agencies, Employed in TO - Employees in the Tourism Organisations

Source: Authors, based on research

Based on the data from *Table 3*. it is noticeable that in relation to the observed attitude of the academic public, the mean is M = 4.60, while the other groups of respondents have an mean between 4.03 and 4.21. Thus, it can be concluded that, although there is a significant difference in the attitude of the academic public in relation to the other groups of respondents, all key stakeholders have a positive attitude towards the creation of the Šumadija tourist region, with the attitude of academic public showing as a highly positive. As for the next claim regarding *natural attractions,* we again see that the academic public has a separate and more positive attitude. When we look at the post hoc analysis of the claim about *the quality of the facilities in tourism*, we see that the opinion of those who are employed in tourist agencies differs from other stakeholders,

and based on descriptive statistics we can conclude that they have a lower mean, significantly more negative attitude than other respondents. As for the claims on *the traffic infrastructure*, based on the post-hoc LSD analysis, we see that the attitude of the academic public in relation to employees in the hospitality industry and tourist agencies differs, and the descriptive statistics shows that they again have a more positive attitude than the other two groups of respondents. Regarding claims related to *employed in tourism and hospitality* in LSD post hoc analysis, we note that there is a disagreement between respondents employed in the hospitality industry and employees in tourist agencies (employees in tourist agencies have a significantly negative attitude towards this element of the tourist destination). As for the claims on *the competitiveness of prices in tourism*, the attitude of tourist agencies in relation to employees in the hospitality industry and the academic public is separated, and the descriptive statistics shows that they have a more negative attitude than the remaining two groups of stakeholders. Speaking about the claim that *tourism in Šumadija contributes to the preservation of the environment* in the post hoc analysis, we see that in this respect, the attitude of employees in tourist agencies is significantly different in relation to the attitudes of employees in tourist organizations and the academic public, and descriptive statistics shows that the groups of stakeholders have negative attitude (low means), except that it is significantly more negative in employees in tourist agencies. Regarding the views of the stakeholders regarding the claim that *Tourism in Šumadija contributes to the living standards of the population and the preservation of social values and tradition* as well as in the case of the first claim, the opinion of the academic public in relation to all other groups of stakeholders was more positive. When we look at the last claim that, according to the ANOVA analysis, there is a significant difference in the views of the respondents, that is, *the new knowledge, technologies, skills and training are available to tourism stakeholders in Šumadija*, there is a significant difference in the attitude of employees in tourist agencies, to all other stakeholders, i.e. their attitude to this issue is more negative in relation to all the other stakeholders.

We made a special post-hoc test for a claim that does not meet the test homogeneity of the variance, namely the *Built and Cultural Tourist Attractions* for which the Games-Howell test was performed, by which it was found that there is disagreement between the academic public and the employees in the hospitality industry. Descriptive statistics of the Games-Howell test shows that the academic public has the most positive, while hospitality industry employees have the most negative attitude on this issue.

In the continuation of the statistical analysis of the data obtained from the survey, we conducted an exploratory factor analysis.

Table 4. Results of Factor Analysis

F A C T O R S	Factor loadings	Eigen values	% of variance
1. Factor- SUSTAINABLE DEVELOPMENT		6.978	24.923
Tourism in Šumadija contributes to a higher living standard of the population.	0.885		
Tourism in Šumadija contributes to higher employment.	0.882		
Tourism in Šumadija contributes to the development of the entire economy.	0.852		
Tourism in Šumadija contributes to the preservation of social values and tradition	0.715		
Tourism in Šumadija contributes to the preservation of the environment.	0.356		
2. Factor -COMPETITIVENESS		2.905	10.375
Traffic infrastructure and availability of tourist attractions.	0.685		
Competitiveness of prices in tourism.	0.659		
The employees in the tourism and hospitality industry.	0.656		
Quality of facilities in tourism (hotels, hostels, restaurants, etc.).	0.629		
3. Factor- SPECIALIZATION		2.222	7.935
Rural tourism.	0.784		
Cultural tourism (monasteries, churches, historical sites, museums, exhibitions, etc.).	0.725		
Mountain, sport and tourism of special interests (hunting, fishing, recreation, wine tourism etc.).	0.707		
City-break tourism and events (tour of Kragujevac and other municipalities, festivals, concerts, etc.).	0.634		
Health and wellness tourism (spa and healing tourism).	0.552		
4. Factor-REGIONALIZATION		1.777	6.348
The promotion of Šumadija's destinations and attractions would be more successful if Šumadija would be promoted as a special tourist region.	0.818		
Destinations in Šumadija will be more competitive if they function as a special regional tourist destination (RTD).	0.784		
If Šumadija could be constituted as a separate tourist region, it would be easier to obtain the EU funds or other investments in tourism.	0.738		
Šumadija is a spatial entity with appropriate natural and created tourist values in which a unified regional tourist product can be formed.	0.519		
5. Factor- INNOVATION		1.39	4.966
Catering companies (hotels, hostels, restaurants, etc.) of Šumadija have good websites.	0.712		
The presence of catering companies (hotels, hostels, restaurants, clubs) of Šumadija on key social networks is good and it helps to increase tourist traffic.	0.696		
Business tourism (MICE).	0.625		
Catering companies (hotels, hostels, restaurants, clubs) in Šumadija are present on relevant tourist sites (booking.com, www.tripadvisor.com, etc.).	0.597		

6. Factor- ICT of Tourist organization		1.287	4.598
The Tourist Organization (TO) Kragujevac helps and promotes all other destinations in the Šumadija district	0.847		
The information on the website of the Tourist Organization of the City of Kragujevac (gtokg.org.rs) is of help to tourists who visit this tourist region.	0.774		
Information on the websites of other Tourism Organizations in Šumadija (Arandjelovac, Topola, Rača, Knić, Lapovo, Batočina) are of help to tourists who visit this tourist region.	0.617		
7. Factor- Elements of tourist destination		1.131	4.041
Natural attractions (parks, rivers, lakes, mountains, climate).	0.743		
Built and cultural tourist attractions (museums, theaters, galleries, concerts, monuments, churches, monasteries, fairs and congresses facilities etc.)	0.666		
New knowledge, technologies, skills and training are available to tourist entities in Šumadija.	0.46		

Source: Authors, based on research

Based on the previous table (*Table 4*.), it can be noted that the respondents from the stakeholders' lines attach great importance to the sustainable development of tourism (describing almost 25% of the variance) as a base, but also to the factor of competitiveness (describing 10.4% of the variance), specialization and regionalization (describing 7.9, respectively 6.4% of the variance). Especially in the field of specialization, it is important to emphasize that the stakeholders give the greatest importance to rural, cultural and tourism of specific interests that are characteristic of rural areas in the Šumadija district. Especially with regard to regionalization, it is emphasized that Šumadija could be more easily promoted, but also be more competitive if it were established as a tourist region. ICT as the basis for innovation and smart specialization is not so important for stakeholders (describing about 5% of the variance). The situation is even worse when it comes to ICT available to tourist organizations in the Šumadija district (describing only 4.6% of the variance). Particularly worrying is the attitude of the stakeholders on the availability of new technologies, knowledge and skills related to tourism, where it could be concluded that according to the findings of factor analysis it is the weakest element of tourism in this part of Serbia.

Conclusions

By analyzing various scientific papers, as well as strategic and legal documents, we have found that defining Šumadija as a territorial unit of a lower level than the national varied in the number of municipalities and places it encompasses. The gravity center has always been Kragujevac, but there is a difference in what municipalities bind to themselves. Also, we could conclude that many of the most significant tourist attractions in Šumadija are located in the rural area, and that there is potential for the development of different forms of tourism, besides rural, primarily cultural and tourism of special interest.

Statistical research has shown that there is a very positive attitude that Šumadija should be established as a unique tourist region because all stakeholders have a positive attitude

on this issue, with the attitude of the academic public as being very positive. In all other attitudes regarding regionalization in tourism, there is a high level of stakeholder agreement. We have also found that out of the 28 claims related to regionalization in tourism, competitiveness, innovation, sustainable development and smart specialization, in most cases there is a consensus of key stakeholders. There is no full consensus of the respondents in the ten claims. In particular, there is a disagreement about attitudes regarding the elements of competitiveness and sustainable development in the area of the Šumadija district. This particularly refers to the claim that *Tourism in Šumadija contributes to the preservation of the environment* that has the lowest means in all surveyed stakeholders, which means that they have the awareness that the principle of sustainable tourism development must be more respected. Also, based on the findings of descriptive statistics of the ANOVA test, we could conclude that the weakest element of the Šumadija tourist region is the traffic infrastructure, as well as the availability of modern technologies, knowledge and training.

Factor analysis has confirmed that the highest level of prioritization when it comes to tourism in the area of the Šumadija district has sustainable development, then competitiveness and specialization, but also regionalization. Issues such as innovation and ICT in tourism, are of lower priority level currently for stakeholders in Šumadija's tourism and as such cannot be the basis for the development of this segment of the economy, that is, much more investment is needed in order to keep up with the competition which precisely based on the development of ICT, creates its own competitive position. Further, this analysis has shown that the Šumadija tourist region should focus on rural and cultural tourism as the basis of its tourism product, as well as the tourism of special interests.

Conflict of interests

The authors declare no conflict of interest.

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THE ROLE OF LEADERSHIP IN NATURAL RESOURCE CONSERVATION AND SUSTAINABLE DEVELOPMENT - A CASE STUDY OF LOCAL SELF-GOVERNMENT OF EASTERN SERBIA

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ABSTRACT

Local authorities have a very important role in preserving natural resources and achieving the concept of sustainable development. Leadership, but primarily sustainable leadership, plays a major role in the management of natural resources. Sustainability at local level refers not only to environmental issues such as the conservation of natural resources, energy and environment but also efforts to involve the community in the processes, develop organizational capacities and promote the principles of sustainable development. This research analyses the importance and role of the leadership of local self-government in the preservation of natural resources and the realization of the concept of sustainable development. The research was performed in local governments on the territory of Eastern Serbia. The correlation method is used to determine the interrelation between leadership and sustainable management of natural resources and practical application of the basic principles of sustainable development.

Introduction

Local self-government with all its institutions, organizations and individuals must make a serious effort to recognize, register and qualitatively and quantitatively explore natural resources and recognize their key role in launching a new cycle of municipal

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development. Sustainable exploitation of natural resources within municipalities which gives rise to sustainable future of their citizens is based on the strategies of sustainable development of the local community as part of the general strategic planning of the municipal development.

Sustainability implies that people use natural resources to the extent that will allow them to regenerate naturally. Sustainable development is a tendency to make the world a better place, balancing social, economic and environmental factors. It is a harmonious relationship between ecology and economy, which aims to preserve the world`s natural resources for future generations. Some authors state that sustainability indicators are based on the attempt to measure or determine the progress of the economic development in two directions: sustaining human wellbeing or preserving the capacity to provide wellbeing (Petrov et al., 2018).

In Serbia, the principles of good governance in municipalities, which include effective and efficient use of natural resources, do not support sustainable progress. One of the greatest challenges in this process is the lack of professional and organizational knowledge and internationally-recognized campaigns for the sustainable development of cities and municipalities. Another challenge is sustainable leadership which is essential for the application of the principles of sustainable development, efficient management, and conservation of natural resources (Paunković et al., 2018). The paper uses the regression analysis to confirm the effects of the leadership of local self-government in Eastern Serbia on the management of natural resources and sustainable development of this region.

Sustainable leadership

In modern business conditions characterized by major dynamic changes, organizations and society as a whole need good leaders. Leaders have the greatest impact on organizational performance. The success of an organization depends on their skills and abilities. There have been many theories on leadership, and consequently a large number of definitions of this term. Stoner et al., defined leadership as "the process of influencing and directing all organizational members involved" (Stoner et al., 1995). According to Grünberg, leadership is "a process in which some members of a group influence others toward group or organizational goals"(Grünberg, 2001). Robins defines leadership as "the ability to influence the group to achieve organizational goals" (Robbins, 2003). Later on, in his view of leadership Robins adds the element of vision so that leadership becomes "the ability to influence the group to achieve the vision or goals of the organization" (Robbins, Judge, 2013, p.368).

Leadership can be defined as a process in which "we make people go where they wouldn't have gone on their own" (Visser, 2011). According to Peters, leadership is about "discovering the passion, persistence, and imagination to get results, being able to find the Wow factor and think the weird thoughts necessary to learn and thrive in a disruptive age" (Peters, 1989).

There is something all these definitions have in common - the essence of leadership is reflected in the use of the influence of leaders on their followers-employees in achieving organizational goals. There is another question to answer: What does sustainable leadership mean? One definition of a sustainable leader may be: "*A sustainable leader is someone who inspires and supports action towards a better world."*

The Sustainability Leadership Institute (2011) offers another definition, suggesting that sustainability leaders are "individuals who are compelled to make a difference by deepening their awareness of themselves with the world around them. In doing so, they adopt new ways of seeing, thinking and interacting that result in innovative, sustainable solutions." (Sustainability Leadership Institute, 2011).

A review of literature on leadership reveals that there is no particular school of sustainability leadership, or more precisely leadership for sustainability. It is rather a practical blend of leadership qualities that apply to a particular context. To survive, organizations will have to accept the concept of sustainable leadership. Bearing in mind the theory of leadership and the practical aspect of sustainability, Visser proposed a model of sustainable leadership which has the following 3 components:

- the external and internal context of leadership,
- traits, styles, skills, and knowledge of individual leaders and
- leadership actions (Visser, 2011).

None of these elements is unique to leaders, but collectively they reflect a distinctive set of traits and actions in response to sustainability.

In practice, sustainable leadership is aimed at introducing major changes, either into the political and economic system, into the practical and business performance of an organization, or at a wider social level. Thus, the model of sustainable leadership is exclusively about the introduction of change.

In the model of sustainable leadership, the context refers to the conditions or environment in which the leader performs/ works and which have a direct or indirect influence on institutions and decision-making. The environment can be either external or internal. When considering the external environment, ecological, economic, political, cultural, and community contexts are taken into account, while the internal environment includes factors such as organizational culture, governance structure, and organizational reach. When developing a sustainable business strategy, leaders must take into account the impact of the organization and its business on the environment, comply with laws and must fit into the cultural context of the society. The role of leaders is to build the organizational culture and structure that allows for sustainable business. This is a culture that fosters interpersonal relationships, mutual respect, and teamwork, and this is a structure that enables employees to participate in making decisions important for the organization's business.

The qualities of sustainability lesdership

Sustainability leadership implies that leaders must be capable of making business sustainable for which they must possess their own styles, skills, and knowledge. The combination of all these features makes a leader unique. These leaders must possess long-term integrity and care for their followers, but they must also set certain demands for their followers to meet. The fact is that individual leaders do not embody all of these traits, styles, skills, and knowledge into their own leadership model, but accept those that suit their personality and circumstances so as to achieve the highest efficiency and implement the concept of sustainability in business (Center for Excellence and Leadership et al, 2007).

Sustainability leaders must care for the well-being of humanity and be guided by ethical values. Sustainable leadership is often associated with care for people's well-being and all other forms of life, as well as ethical standards. Tuppen and Porritt look on the ethics in sustainable development as the basis of today's equation, ecological justice, intergenerational equity, and stewardship (Tuppen and Porritt, 2003).

Sustainability leaders should be people who explore – open-minded leaders. They must actively search for new knowledge and diverse opinions. This means that they must be willing to question the value of products or services to society and be ready to challenge the traditional models of economic growth.

Sustainable leadership implies that these leaders must be visionary and courageous people. According to Collins, the leader must have the absolute faith that he can and will prevail in the end, regardless of the difficulties, and at the same time confront the most brutal facts of their current reality, whatever they might be (Collins, 2001). Leaders must be good at sharing the vision with others, enabling a dialogue that inspires action and leads to common opinions (active listening, emotional intelligence, reflection) and creating conditions that encourage learning from experience.

Sustainable leaders concentrate on creating a culture and structure that provides support and encouragement to collaborators and recognizes success and achievements. Sustainability leaders "build a climate of support and responsibility, not a climate of control" (Center for Excellence and Leadership, 2007). Similarly, Immelt says: "It's critical to understand people, to always be fair, and to want the best in them"(Immelt, 2007).

Sustainability leaders must be innovative and ready to respond to various challenges. This means they are good at predicting possible solutions or alternatives, thinking beyond standard decision frameworks by introducing creativity into thinking and practice.

Sustainability leaders see the importance of interdisciplinarity. They assimilate the knowledge of physical sciences, social sciences, technology, business, and other disciplines. Sustainability leaders must be aware of the impact their organization has on the environment, society, and all stakeholders. They must constantly search for opportunities to create new markets and develop the organization as a whole. It is also important to ensure the transparency of the organization. The impact of the organization

on the environment can be presented in several ways. One way is the environmental accounting method that is used to understand the impact of sustainable development on the organization`s profit. Environmental accounting shows how much it would cost to avoid the environmental impact of its energy use, waste disposal, and water treatment.

Sustainability leaders must be aware of the importance of respecting diverse opinions of stakeholders. They are open to different points of view and different belief systems, both within the community and at a wider, global level or in the cultural and political fields, and they must be able to adequately incorporate all these different views. Immelt states that "even if the leaders have the answer, they will often let the team find its own way" (Immelt, 2007).

Sustainability leaders give equal importance to the governance system and corporate culture. The governance system is important because it represents a set of decisions that leaders or general managers make and which must be implemented to achieve organizational goals. However, they know that ultimate responsibility lies at the highest level. Therefore, leaders must shape such a corporate culture that will generate the necessary motivation in employees to conduct their activities and make the best possible decisions (Shafique & Kalyar, 2018).

Sustainabile lesdership in the context of local self – government

Sustainability in a local context implies not only environmental issues such as conservation of natural resources, energy, and environment but also efforts to involve communities in the processes, develop organizational capacities, and promote the principles of sustainable development. Sustainable leadership is the promotion of a wide range of practices by a large number of actors including Council members, citizens, legislators, and others. In his "Dynamics of Leadership", Van Wart defines the sustainable leadership of local governments as "a kind of social change leadership"(Van Wart, 2011). However, the key role of state administration and local authorities (in local sustainability) has been largely ignored in the literature.

The role of local self-government is critical because of its close relatedness to environmental issues (Jepson, 2004, Saha & Paterson, 2008). As many local governments have turned to the implementation of sustainable development, it has become particularly important how to improve the implementation (Krause, 2010; Sharp, Daley & Lynch, 2011; Wang, Hawkins, Lebredo & Berman, 2012). In this regard, leadership is one of the most important factors in implementation (Aristigueta & Zarook, 2011; De Waal, 2010; Kaiser, Hogan & Craig, 2008; Pressman & Wildavsky, 1973; Trottier, Van Wart & Wang, 2008).

While local leaders, citizen/activist groups and governments (state legislatures) are undoubtedly important in initiating and enhancing sustainability, executive authorities have the most important role in local sustainability becoming increasingly vigorous in its implementation. Executive authorities ensure decision implementation, which can be quite complex and time-consuming; they play an important role in overcoming

organizational resistance to change; they work with the local community to improve educational and regulatory elements with the aim of increasing effectiveness (Borins, 2000). Wang and his associates examined the most acceptable type of leadership theory (Wang et al, 2014). This process started with the establishment of a framework that defines sustainable leadership at the local government level of the US and the definition of the most appropriate general theories of leadership. Based on the results of their research, Wang and associates provided a comprehensive definition of sustainable leadership at local government level. According to them, sustainable leadership can be defined as the process of promoting specific environmental, economic, and social issues by a wide array of actors that include local council members, citizens, state legislators, and public administrators that together produce positive outcomes in communities (Wang et al, 2014; Zhao, J. et al, 2018).

In general, when it comes to the theory of sustainable leadership and the practice to be carried out at the local level, there are several conclusions:

- local authorities play an important role in the implementation of sustainability at the local level,
- it is important to raise the awareness of the local administration,
- leaders of local governments must take appropriate managerial actions.

Managers of local governments must be both good leaders and good managers. A broad array of different approaches used by leaders in different local governments and city administrations indicate that there is no single path towards achieving sustainable development. The relatively low level achieved in the implementation of the concept of sustainable development in the local governments of Eastern Serbia stems from a complex and challenging environment, a lack of financial resources, insufficient knowledge on sustainable development, a low level of motivation of employees in local self-government and many other factors. This suggests that a strong managerial and leadership capacity of local government leaders is needed to implement specific sustainability initiatives.

Eastern Serbia region – location and natural resources

Eastern Serbia is located between the Danube River and two corridors: Corridor X (Serbia) and Corridor IV (Bulgaria). It borders Romania in the north and Bulgaria in the east. It covers an area of 7,133 km^2 and includes two administrative districts - the administrative district of Bor and the administrative district of Zaječar, with the municipalities of Knjaževac, Boljevac, Sokobanja, Negotin, Kladovo, and Majdanpek.

The territory of Eastern Serbia is predominantly hilly-mountainous, with arable land accounting for about 45% of the entire territory. The most developed agricultural systems are livestock farming, crop farming, fruit and vine growing. Forests occupy about 40% of the total area of Eastern Serbia. In terms of its geographical position, the area of Eastern Serbia belongs to the continental climate zone with pronounced temperature

extremes, large precipitation deviations and unfavorable distribution of rainfall during the year. The main industries of Eastern Serbia today are power generation, copper production, agriculture, forestry, wood processing industry. They are accompanied by the clothing and footwear industry, chemical industry, tourism, construction, etc. (http://www.rasr.si/en/files/default/Isto%C4%8Dna%20Srbija.pdf

The resources that can foster the development of Eastern Serbia are spas and thermo-mineral springs (Sokobanja, Brestovačka Banja, Gamzigradska Banja), copper mines (Bor and Majdanpek), anthracite mines, coal mines, protected natural areas ("Djerdap" National Park, Stara Planina Nature Park...), cultural heritage (Felix Romuliana (UNSECO), Golubac fortress, Sokograd).

Eastern Serbia is a rural region and one of the least developed regions in Serbia with the high unemployment rate, poor infrastructure, population ageing, and outflow of young adults. The population decline in rural areas is twice as high as in urban areas, and it is most pronounced in the Southern and Eastern Serbia Regions (http://www.stat.gov.rs/sr-latn/oblasti/stanstvo/). The educational structure of the population is characterized by disturbing trends, especially compared to the urban population. It is most unfavorable in the South-Eastern and Eastern Serbia Regions where as many as 58% of the population don`t have more than primary education, and half of them don`t have primary school completed (http://www.stat.gov.rs/sr-latn/oblasti/stanovnistvo/). Rural areas are confronted with numerous problems. Hence there is an array of determinants that affect successful management of rural development (Đukić et al., 2017, Vilke et al., 2019). In order to encourage young people to live and work in rural areas, it is necessary to increase the investment attractiveness of these regions. This is where local authorities should occupy a crucial role. Leaders and employees in local governments must be aware of the importance of sustainable development and incorporate the principles of sustainability into the management process.

Methodology

The research was carried out in local governments on the territory of Eastern Serbia. (Boljevac, Bor, Knjaževac, Zaječar, and Kladovo) during September 2018. The survey method was used as the research method. The respondents were local self-government employees. Their responses, attitudes, and opinions were used to determine the type and performance of leadership in local governments, and to determine the role of leaders in natural resource conservation and implementation of the sustainable development concept at the local level. Specially designed forms (questionnaires) were used to obtain the necessary data and information. This research was conducted using structured questionnaires (surveys). Respondents were asked to answer the questions by selecting the most appropriate answer option. Questionnaires for leadership testing were adapted to the questionnaire used by Jovanović (Jovanović, 2016) and Stevanović (Stevanović, 2017) in their research. Statistical processing of the obtained data was performed using the SPSS software package (Statistical Package for the Social Sciences). The starting hypothesis of the study is: "Effective local self-government leadership is correlated with the principles of sustainable development."

In order to determine the interdependence between leadership as the independent variable and sustainable management of natural resources and practical application of the basic principles of sustainable development as dependent variables, method of correlation is used. Correlation is a bivariate analysis that measures the strength of association between two variables and the direction of the relationship. It's a statistical technique which determines how one variables moves/changes in relation with the other variable. The main result of a correlation is called the correlation coefficient ("r"). It ranges from -1.0 to +1.0. A value of ± 1 indicates a perfect degree of association between the two variables. As the correlation coefficient value goes towards 0, the relationship between the two variables will be weaker. The direction of the relationship is indicated by the sign of the coefficient; a + sign indicates a positive relationship and a – sign indicates a negative relationship. A correlation can be calculated between two numerical values or between two category values. Pearson *r* correlation is the most widely used correlation statistic to measure the degree of the relationship between linearly related variables.

Research results and discussion

The data obtained were used to examine the role of local self-government leadership in the management of natural resources and implementation of the concept of sustainable development and to determine how responsibly local self-government leaders act towards their employees. Base on the obtained data, we determined:

- how much the employees in local governments are familiar with the concept of sustainable development and how much they are willing to expand their knowledge in this field;
- how leaders motivate employees, how they involve them in the decision-making process and whether they care about their needs (an important aspect of the sustainable business) and
- how important the role of leadership is in achieving the concept of sustainable development.

Table 1. Responses to a group of questions about leadership

Leadership	Boljevac	Bor	Kladovo	Knjaževac	Zaječar
	Average	Average	Average	Average	Average
Managers make decisions taking into account the needs of employees	3.44	3.09	3.24	3.24	2.90
Local self-government employees publicly review decisions of their immediate superiors when they disagree with them	2.86	3.09	3.03	3.12	2.80

Leadership	Boljevac	Bor	Kladovo	Knjaževac	Zaječar
	Average	Average	Average	Average	Average
Employees in the local self-government publicly review decisions of the general manager when they disagree with them	2.50	2.89	2.66	3.06	2.53
There is a good working atmosphere in the local self-government	3.94	3.77	3.37	3.41	3.23
Management encourages employees to acknowledge the mistakes from which they can learn	3.69	3.20	3.21	3.44	3.43
Co-workers respect each other	4.28	4.00	3.97	3.71	3.60
Superiors care about the needs of local self-government employees	3.56	3.14	3.05	3.12	3.03
Managers often stress their position in the local self-government	3.36	3.43	3.50	3.12	3.47
Managers are primarily interested in fulfilling their tasks	4.08	3.83	3.45	3.82	4.17
Managers initiate changes in the local self-government	4.00	3.54	3.50	3.82	3.40
Managers spend most of their working time exercising strict supervision of their employees in the local self-government	2.78	2.71	3.39	3.09	2.70
Managers find it important to generate motivation and satisfaction of employees in the local self-government	3.03	2.74	2.71	3.15	2.70
Employees in the local self-government are motivated and satisfied	2.81	2.34	2.16	2.71	2.57
The employee commitment to the organization is important to managers	4.08	3.57	3.24	3.59	3.87

Source: Author's Calculation

Table 2. Responses to a group of questions related to sustainable development

Sustainable development	Boljevac	Bor	Kladovo	Knjaževac	Zaječar
	Average	Average	Average	Average	Average
I am familiar with the concept of sustainable development	4.22	3.14	3.18	3.53	3.60
I am interested in learning and expanding knowledge about sustainable development	4.17	4.00	3.95	3.91	4.17
Concepts of sustainable development and environmental protection have the same meaning	3.17	3.43	2.89	3.26	2.87
Sustainable development enables the development of industry, regardless of natural resources	3.36	3.17	2.84	2.94	2.90
Preservation of natural resources is important for sustainable development	4.69	4.46	3.97	4.35	4.47
Increasing energy efficiency plays a key role in achieving the concept of sustainable development	4.56	4.09	4.11	4.21	4.37
Achieving sustainable development is not possible without reducing the consumption of energy and natural resources	4.17	3.83	3.97	3.62	4.10
My local self-government carries out various activities that contribute to the preservation of natural resources	3.83	3.46	2.92	3.76	3.27
My local self-government carries out various activities that contribute to the protection of the environment	4.06	3.37	3.11	3.82	3.33
My local self-government implements various projects that increase energy efficiency	4.08	3.26	3.18	3.82	3.03
Local self-government is the initiator of a large number of sustainable development projects	3.97	3.37	2.97	3.59	3.00
Local self-government employees are constantly receiving information on sustainable development projects	3.36	3.20	2.39	3.12	2.37
It is important to involve citizens in sustainable development (SD)projects	4.53	4.17	3.92	4.29	4.40
Local authorities (LA) are always committed to involving citizens in designing SD projects	3.47	2.86	2.71	3.53	2.93
LA play a key role in achieving sustainable development at the local level	4.39	3.66	3.55	4.26	4.10
When formulating policies, LA must take into account economic, environmental and social development goals	4.53	4.06	4.11	4.26	4.30

Source: Author's Calculation

The tables 1. and 2. present the average values of the answers given by the employees in the local governments of Eastern Serbia.

Looking at the link between leadership and the concept of sustainable development, it is assumed that there is a correlation between these two phenomena. Organizational leadership must be oriented towards the principles of sustainable development. Effective management of natural resources implies that leaders in local governments are well aware of the principles of sustainable development which they apply in practice.

This means that efficient management of natural resources and sustainable development result from efficient local self-government leadership. Thus, the application of the concept of sustainable development is a dependent variable, and leadership is an independent variable. The dependence between the variations in the application of the concept of sustainable development and leadership in local governments will be explained using the correlation method. The coefficient of determination and correlation are shown in the following tables.

Table 3. – Coefficient of determination and correlation

Regression parameters	r	Coefficient of determination	Corrected coefficient of determination	Standard error
	0.592	0.351	0.347	0.4941

Source: Author's Calculation

The value of the coefficient of correlation (R) is 0.592 and it is positive. Thus, it can be concluded that there is a direct positive correlation between the observed phenomena (leadership and the concept of sustainable development). The value of R ranging between 0.50 and 0.75 indicates a moderate to good relationship between the variables. In this case, the value of the coefficient R is 0.592, which suggests that there is a moderate to good connection between the leadership and the implementation of the sustainable development concept.

The value of the corrected coefficient of determination is 0.347. It indicates the existence of dependence between the observed variables. Based on the value of the coefficient of determination, it can be said that in 35% of cases the leadership of local governments has an impact on the implementation of the concept of sustainable development.

Since the probability of error is small (0.000), the confidence interval is very high (99%). The value of the F- test is statistically significant. This indicates that the coefficient of determination is very important for the prediction of the variation between the variables.

It is further necessary to analyze the shape and strength of the relationship between the indicators. The statistical model parameters, intercept and slope ($\beta 0$ and $\beta 1$) were tested using the T-test. The null hypothesis is that there is no linear relationship between the variation of the observed events in the basic set, i.e. that X does not affect Y: H0: $\beta = 0$. A two-way alternative hypothesis H1 is also set: $\beta \neq 0$. The following table shows the

statistical parameters for the variables of leadership and awareness of the concept of sustainable development.

Table 4. Statistical parameters for the observed variables (leadership and the concept of sustainable development)

Statistical parameters of the model		Non-standardized coefficients		Standardized coefficients	t -test	Probability of error
		B	Std. error	Beta		
	Intercept/constant	1.928	0.185		10.445	0.000
	Leadership - slope	0.531	0.055	0.592	9.615	0.000

Source: Author's Calculation

The value of β1 is different from zero and amounts to 1.928. If the value of β1 is different from zero, the regression line can be used for prediction. The probability value is less than the significance level (0.05), and the value of the t-test for the assessment of the slope is statistically very significant (9.615). Since the p-value is less than the level of significance and the probability of error is less than the adopted one, the null hypothesis is rejected and the alternative H1: $\beta \neq 0$ is adopted.

Based on the obtained results it can be concluded that the coefficient of determination shows that in 53% of cases the leadership of local self-government has an impact on the implementation of sustainable development concepts in local governments. It follows that the starting hypothesis is confirmed: "Effective local self-government leadership is correlated with the principles of sustainable development."

Conclusions

There is a goal and a tendency that local self-government has to achieve. There are certain conditions and limitations, as well as the opportunity to accept the most suitable type of behavior from a set of possible behaviors. In organizational behavior, it is very important to respect certain principles. These principles relate to the thinking and behavior of people who manage local governments and working processes or participate in them.

The relationship between local self-government and natural resources is defined by national, regional and local strategies as well as legal regulations. However, in addition to legal frameworks, numerous other factors affect the conservation of natural resources and implementation of the concept of sustainable development in local self-government. Our research showed that one of the most decisive factors is the leadership of local self-government. Leadership is an important factor that affects the progress of the local community and enhances the quality of life of people living in that community. Based on philosophy, vision and values, leaders define the strategy, structure, and systems of local self-government that will contribute to the sustainable development and improvement of the quality of people's life. Good management of natural resources and achievement of sustainable development is the result of an efficient leadership of local self-government.

Conflict of interests

The authors declare no conflict of interest.

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CANNED: THE RISE AND FALL OF CONSUMER CONFIDENCE IN THE AMERICAN FOOD INDUSTRY, BY ANNA ZEIDE, A BOOK REVIEW

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ABSTRACT

The paper prepared in the form of a book review is a review of the book written by Anna Zeide, assistant professor of Professional Practice at Oklahoma State University, entitled: Canned: The Rise and Fall of Consumer Confidence in the American Food Industry, published in 2018. The book is a part of the California Studies in Food and Culture Series of the publisher University of California Press, and is the winner of the James Beard Award for Reference, History & Scholarship for the year 2019, which is delivered by the James Beard Foundation, which has been promoting the food industry in the United States of America for already 30 years now, through scientific-research work, the development of the industry itself, the development of female leadership and leadership in general, as well as through other programs (James Beard Foundation, 2019).

Introduction

Anna Zeide, the authoress, a professor of Oklahoma State University, a food historian, is one of the most significant representatives of this academic discipline in the world. Her book, entitled: Canned: The Rise and Fall of Consumer Confidence in the American

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Food Industry, which was published by the University of California Press in 2018, is the subject matter of the research conducted in this scientific article. (Zeide, 2018).

Within the framework of the part entitled 'The Goal of the Paper and the Methodology Used', the academic, i.e. scientific goal of this review, as well as the methodology which will be used, will be presented.

Within the framework of the part entitled 'The Paper Results with Discussion', the structure of the book will be presented per chapters and an analysis of its content will be carried out by applying the stated scientific methodology.

The conclusive considerations, as well as the stated references, will be given at the end of the presentation.

The book systematically shows the development of canned food in the United States of America, analyzing the historical context of its first steps 150 years ago, in the time of the earliest beginnings of the food industry and in the time when the Americans had trust in packaged food, as the author herself judges this period.

The Goal of the Paper and the Methodology Used

The goal of the paper (the book review) is to objectively present the book by the authoress Anna Zeide, Assistant Professor of Professional Practice at Oklahoma State University, entitled: Canned: The Rise and Fall of Consumer Confidence in the American Food Industry, published in 2018, through the presentation of the structure of the book, the references and the other sources used, and the content analysis. Through the book review, both scientific and social influences of the book are also perceived. The methods characteristic of social sciences, such as the historical method, a case study analysis, deduction and induction, will be used for the research. The paper has been written based on the secondary research done by the authors.

The Paper Results with Discussion

The book entitled Canned: The Rise and Fall of Consumer Confidence in the American Food Industry, by the authoress Anna Zeide, published in 2018, is published both in its paper and in its electronic editions. It has 280 pages, and for her research study, the authoress used and cited the references and the selected bibliography from archives and libraries specialized in agriculture, the food industry, the medical and historical area, as well as those of a general type, such as: California State Archives, Sacramento, CA; College of Agriculture and Life Sciences at Stanford University Medical Center, Palo Alto, CA; Grocery Manufacturers Association Library. National Canners Association Archives. Washington, DC; National Archives and Records Administration, National Archives at College Park, College Park, MD; Wisconsin Historical Society Archives, University of Wisconsin-Madison. She also used periodicals, such as: American Food Journal, Canner, Canner/Packer, Processed Prepared Food, Canning Age, Chicago Tribune, Journal of Marketing, Los Angeles Times, Market Growers Journal, New York Times, Western

Canner Packer, Wisconsin Canners Bulletin and Wisconsin Farmer. Formal references include more than 150 different print sources dating from 1812. (Appert, 1812)

The book is structured into six main chapters, which follow after the introductory chapter, which are added to by the conclusion and the auxiliary segments (Acknowledgments, Notes, Selected Bibliography and Index). These six chapters present the best-known events in the history of the food industry of America from its early beginnings to the contemporary era.

The six chapters in the book treat the two periods in the history of the canning industry in the USA. The first period encompasses the years from the 1800s to the 1930s, which the authoress considers to have represented a consumer-driven culture to canning companies. In this period, companies financed assets in order to stimulate the development of regulation and research in the field of food safety by attracting their consumers' trust in this way.

The second period, which relates to the 1930s and has been lasting to date, is marked by the efforts of the canning industry to also attract consumer trust, but this way implies using psychology and marketing, i.e. with the help of advertising, branding as the primary form, whereas research studies on products safety are less important to them, and the very awareness of that fact indicates the problem of the transparency of the business operations carried out by these companies.

Race and class issues are important for assumptions and decisions that people make. In one stage of its history, especially in the white-oriented middle class, canned food has a social context in terms of affordable food for those who cannot afford to be "foody" (a metaphor).

Within the framework of the first chapter, entitled "Condensed Milk: The Development of the Early Canning Industry", the authoress presents the food industry in America, i.e. the canning industry and its early beginnings. Within the framework of this chapter, the authoress presents her knowledge that arose from numerous archival and library-resources starting from 1795. The chapter begins with an illustration of the events dating back in 1864 and the letter of a soldier who fought in the Civil War, who had "written it on the back of a label peeled from a can of Borden's Condensed Milk" (p. 1) (Wisconsin Historical Society, Madison).

Within the framework of the second chapter, entitled "Growing a Better Pea: Canners, Farmers, and Agricultural Scientists in the 1910s and 1920s", the authoress emphasizes the role of agricultural scientists in the promotion of the products of the canning industry. The canning industry developed a broad network in cooperation with scientists, with the help of the law and the media so as to attract consumers, and the final effect the more recent history has also given rise to a change in the nutrition system of the Americans based on processed food.

Within the framework of the third chapter, entitled "Poisoned Olives: Consumer Fear and Expert Collaboration", the authoress presents a case from 1919 and 1920, when botulism in canned olives appeared, and the death of the 18 people who had consumed

those olives. She presents the answer from the industry that became aware of the weakness in the system by establishing the Botulism Commission of Scientific Experts, with the aim of creating the olive production safety process and the processing that could ensure no similar crisis in the future, also taking the other measures whose effect reflected in the creation of a network of the owners of canner enterprises, scientists and the representatives of the System who were shaping the food system in America.

Within the framework of the fourth chapter, entitled "Grade A Tomatoes: Labeling Debates and Consumers in the New Deal", the authoress deals with transparency issues. She presents a lack of information about the quality of products and the nutritional features of the same canning companies that were creating loyalty to a brand, simultaneously promoting the companies themselves. The authoress presents the process of the selection of tomatoes for canning, the checking of their quality, the grading and so forth, the stages within the framework of which the grower, the agricultural scientist, the canner and other persons were involved, of which, however, consumers had no knowledge at all given the fact that no pieces of information were displayed on the labels of such tomato cans; so, at the begging of the 1930s, that needed to be changed by consumer advocacy and government representatives. (p. 122) The New Deal measures awoke consumers themselves, too, not only the American economy. As a reformer and the creator of the New Deal measures, Kainz writes in his work entitled "The End of Laissez-Fair" that it is not true that the God-gifted "natural freedom" in economic activities does not belong to individual persons. He wanted to point to the fact that the world is not so ordered that an individual's personal and social interests are always in compliance with each other, and that it is not true, either, that an interest has become recognized since it is frequently the case that the individual persons who aspire to goals are insufficiently informed or are too weak to achieve them. (Ilić, 2017) The authoress pointed out that many of the agencies that had been created by the New Deal had had the sections dealing with consumers' interests. (p. 125)

Within the framework of the fifth chapter, entitled "Fighting for Safe Tuna: Postwar Challenges to Processed Food", the authoress presents the case of the appearance of botulism in 1963 in tuna cans, from which several people died; however, differently from the situation in the past when scientists had been engaged in the development of safe processing processes and food canning, the accent was no placed on the promotion of tuna on a wide front so as to forget about the problem, or ignore it.

Within the framework of the sixth chapter, entitled "BPA in Campbell's Soup: New Threats to an Entrenched Food System", the authoress presents the case mentioned in the title of the chapter, and highlights the link between Bisphenol A used for the majority of canned food and ADHD, cancer and reproductive disorders. Newer research, as one conduced in Tecnologico Nacional de Mexico finds connection of canned food and cancer cells regarding the fact that common beans (Phaseolus vulgaris L.) processed by canning, contain phenolic compounds with the ability to inhibit the proliferation of CRC cells. (Moreno-Jiménez et all, 2019)

The authoress presents the canning industry in the United States of America, i.e. its development in terms of the use of technology, leading manufacturers' strategies and marketing, starting from consumers' original trust, later followed by their great resistance that was present during the contemporary period of the development of the industry, and the current moment. The authoress presents the role of different interested parties, i.e. trade groups, and also indicates the role of political lobbying and public relations in the marketing of canned food.

The book is inspired by the attitude that what people consume and the manner in which they process and consume food gives a shape to the quality of life and the social contexts coexisted by people. As the academic discipline the authoress primarily deals with as her expertise, the history of food has also been built on by the other scientific disciplines from within the field of social-humanist sciences, as well as technical sciences, in the writing of this book, which proves the breadth of the subject matter of the research and a potential scientific and social significance of the book. If the scope of the book is perceived, it is also possible to notice one deeper social dimension that is indicative of the effect of the availability of no seasonal food and the food not grown in the same locality in which its consumers live on the lives of these consumers. With respect to the presentation of the market of the food industry, the authoress has perceived the supply chain from small manufacturers to industrial mass manufacturing, drawing a parallel between the two chains and emphasizing the differences between a jar containing a product manufactured by an individual manufacturer with a label providing full information and an insight into the origin of the product and its quality and identifies the manufacturer and the values the product carries with itself, on the one hand, and cans containing food that brings another metaphor, on the other. The canned food produced by industrial manufacturers sends different messages and brings with itself messages related to a different cultivation, packaging, distribution, and promotion, which also requires a specific "window" which would enable consumers to gain an insight into the essence of manufacturing.

The whole project is the identification of the overall industry and the demystification of the seemingly easy choice made by consumers every day and the purchase decisions they make, behind which, however, there are different propaganda messages, promotional contents, a political context and the other contents thanks to which the positioning and repositioning of different ideas and brands in the consumer's consciousness are performed, the development of different attitudes towards the origin of the goods, the quality and so on, yet even the attitudes of the ethnocentricity of consumers with respect to the values forgotten by consumers while using convenience food like "ethnic identity, value of family togetherness, reflection, and diversity conveyed by home-cooked food, traditional recipes, and shared meals". In this part of the book, the authoress states the attitudes of the editor of Food for People, Not for Profit (and agrees upon them) that the essence of the health and political problems advocated by consumers are, in fact, a more fundamental criticism of the dietary culture promoted by the processed-food industry. (Lerza, Jacobson,1975)

Regarding American processed-food industry, findings of a study conducted in 2017 shows that persistence of profit in food processing in USA as well in EU is lower than in other manufacturing sectors. (Gschwandtner, Hirsch, 2018)

The papers dealing with the ethnocentricity of consumers indicate the fact that this concept relates to the people who find their group to be the center of the world, who interpret everything within the perspective of their own group, rejecting all those who are not similar to them from a cultural standpoint and accepting unreservedly those who are similar to them from a cultural standpoint. (Rakić, Rakić, Stanojević, 2019) Similarly to the authors Šapić, Furtula, Durkalić, the authoress highlights the fact that the western-styled culture is characteristic for its efficient manufacturing, whereas the southern-styled culture of food is determined by hedonism and a specific consumption, for which reason it is traditionally liaised with the local cultivation of the product. (Šapić, Furtula, Durkalić, 2018)

The scientists in the fields of biology and chemistry, i.e. the field of natural sciences, who had worked in the past, whose research studies had been financed by the canned food manufacturers, were replaced with scientists working in the field of social sciences, with the intention to ensure a stronger position of canned food in American society. Different sociologists, marketers and psychologists, as well as political lobbyists, are included in the network with canners and officials, so that consumers could be more familiar with buying canned food. In one period, through changing the relations of consumers, the industry and representatives of regulatory bodies, these sides in the dialogue took even different positions. At one point in time, canners were 'for' anti-regulatory processes, as well as 'for' consumer advocacy, considering them to be Canners, which were opting for an anti-regulatory processes, as well as consumer advocacy, considering them as an unnecessary and limitative for food industry.

A study conducted by Lerro and associates, in 2018, regarding preferences for corporate social responsibility in the food industry find that there are five consumers' groups: 'environmentalists', 'pro-socials', 'collectivists', 'animal friends' and 'selfish health centered'. His study shows that consumers are willing to pay more to reward food companies that are socially responsible. (Lerro et all, 2018)

The authoress emphasizes the role of the state regulatory bodies in the regulation of the food and canned industry in America, and the support of the nongovernment sector, i.e. of different consumers' associations and agencies for health promotion. She also presents a pronounced interest of and the doubt of some consumer niches in the transparency of the business operations carried out by the food industry, the work of the federal subsidies for agriculture, and the intentions and influences of the industry on environmental health, the impact on climate change, as well as the alternative ways of eating, the consumer growing interest in the origin of products and their quality. The authoress also highlights the individual and collective transformation of the consumer attitudes that may lead to a change in the food system in the long run since broader scopes are necessary. Different examples show that there are quite a lot of things that the

individual consumer has no knowledge of and cannot control, so that there is a critical need for broader forces in the reshaping of the food industry and food justice activists also have their role in this process, beside the individual consumer. Behind the ongoing changes lie billions of decisions made by individual consumers that may change the food issues and the political system. It is important that individual consumers should think about where a food comes from and create a critical mass in order to make a systemic change. Also, collective consumers can be introduced and educative programs can be established so as to make a broader effect.

Conclusions

The historical analysis performed by the authoress starts with the phenomena of canned milk, moving on to the fallout of the processed food industry in America, represented by the presence of the bisphenol A chemical (BPA) in a tomato soup. The authoress demystifies what the canned food industry owes its success to, by presenting the examples from science, technology and politics that altered the course of the consumer behavior towards canned food. The authoress points out the fact that canning, as a segment of the food industry in America, has a great impact on the American business history, as well as its food systems, and a significant importance to consumers.

The book shows the pathway canned food passed and how it shaped the American lifestyle and became a part of the subculture. The complex presentations are also inclusive of agricultural manufacturing, agro-business, the economy, marketing, biochemistry, and nutrition science so as to make the ambience presentation complete and create a holistic approach to the analysis of the food industry (the canning industry in particular) in America.

The book engages various topics concerning the broad scientific aim and scope, and forces the authoress to involve herself in studying business, technology, history, and sociology so that she could completely perceive the effects that canning has on American society.

Conflict of interests

The authors declare no conflict of interest.

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Introduction

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Acknowledgements

Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.). They should be brief.

Conflict of interests

The authors declare no conflict of interest.

References

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2. Hjalager, A. M., & Richards, G. (Eds.). (2003). *Tourism and gastronomy*. Routledge, London.
3. Mićović, A. (2017). Tourism Development and Evolution of Tourism Related Rules, *2nd International Scientific Conference – Thematic Proceedings II*, Faculty of Hotel Management and Tourism, Vrnjačka Banja, 181-202. Retrieved from http://www.hit-vb.kg.ac.rs/conference/images/thematic_proceedings/2017_II.pdf
4. Stošić, L., & Stošić, I. (2013). Diffusion of innovation in modern school. *International Journal Of Cognitive Research In Science, Engineering And Education (IJCRSEE),* 1(1), 12-24.

5. Domanović, V., Vujičić, M., & Ristić, L. (2018), Profitability of food industry companies in the Republic of Serbia, *Economic of Agriculture*, 65(1), 11-32. doi:10.5937/ekoPolj1801011D
6. The Food and Agriculture Organization of the United Nations (FAO), Retrieved from http://www.fao.org (July 31, 2018)

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Example:

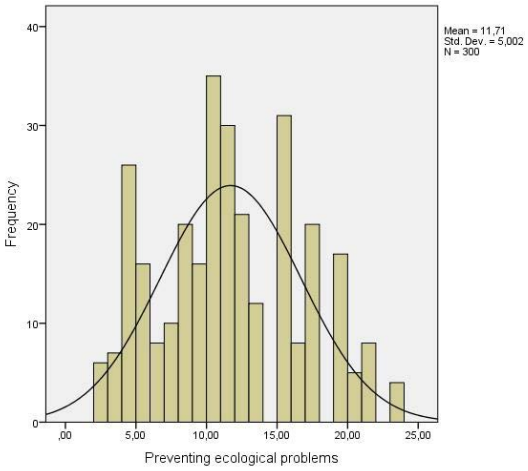
Table 1. The distribution cost of packaged goods from Subotica to retail-store objects

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

Source: Petrović, 2012

All illustrations whether diagrams, photographs or charts are referred to as Figures. The name and number of figures should be centered on the line above a figure.

Figure 1. Agriculture, value added (% of GDP)



Source: Authors' calculations

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