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Адреса уредништва / Editorial office
Београд, Волгина 15; тел/факс (+381)11/6972-848; E-mail: economicsofagriculture@ea.bg.ac.rs
Belgrade, Volgina 15; phone/fax (+381)11/6972-858; E-mail: epoljoprivrede@gmail.com

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TENDENCIES AND PREDICTION OF INDUSTRIAL PLANT PRODUCTION IN SERBIA

Srboljub Nikolić[1], Beba Mutavdžić[2], Nebojša Novković[3], Zorica Sredojević [4], Miroslav Bjegović[5], Dragana Tekić[6]

**Corresponding author E-mail: bebam@polj.uns.ac.rs*

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ABSTRACT

After grain Industrial plants is the second largest group of crops in Vojvodina, and it is cultivated on around 400-450 thousand hectares. The most common is sunflower, followed by soybeans, sugar beets, oilseed rape and the least cultivated one is tobacco. The research analyzes the harvested area, annual production and yield of these most important types of industrial plants in Vojvodina in the period from 2005 to 2019. Descriptive statistics were used for analysis, based on the determined average annual rates of change in the analyzing period, which was base for prediction of production characteristics for the next five years, 2020-24. The average harvested area in analyzed period was: sunflower 173,000 ha, soybeans 160,000 ha, oilseed rape 14,000 ha, sugar beet 60,000 ha and tobacco 3,000 ha. The results of prediction show that will be certain changes in the sowing structure of industrial plants in Vojvodina.

1 Srboljub Nikolić, Ph.D. Assistant professor, University of Defence, Military Academy, Veljka Lukića Kurjaka 33, Belgrade, Serbia, Phone: +381692078252, E-mail: srboljub.nikolic@yahoo.com, ORCID ID (https://orcid.org/0000-0002-1941-5332)

2 Beba Mutavdžić, Ph.D., Associate professor, University of Novi Sad, Faculty of Agriculture, Trg D. Obradovica 8, Novi Sad, Serbia, Phone: +38162200133, E-mail: bebam@polj.uns.ac.rs, ORCID ID (https://orcid.org/0000-0002-7631-0465)

3 Nebojša Novković, Ph.D., Professor, University of Novi Sad, Faculty of Agriculture, Trg D. Obradovica 8, Novi Sad, Serbia, Phone: +38162200132, E-mail: nesann@polj.uns.ac.rs, ORCID ID (https://orcid.org/0000-0003-2419-5765)

4 Zorica Sredojević, PhD, Full Professor, University of Belgrade, Faculty of Agriculture, Nemanjina 6, 11080 Belgrade-Zemun, Phone: +381 11 441 3297, E-mail: zokas@agrif.bg.ac.rs, ORCID ID (https://orcid.org/0000-0001-7224-1573)

5 Miroslav Bjegović, PhD, Associate professor, Educons University The Faculty of Security Studies, Vojvode Putnika 7, Sremska Kamenica, Serbia, Phone: +38163248242, Email: bjegovicj.miroslav@gmail.com, ORCID ID (https://orcid.org/0000-0002-5392-6216)

6 Dragana Tekić, Mr.Sci., Assistant, University of Novi Sad, Faculty of Agriculture, Serbia, Phone: +381691994316, E-mail: dragana.tekic@polj.uns.ac.rs, ORCID ID (https://orcid.org/0000-0002-1924-6196)

Introduction

The most important industrial crops in Vojvodina are sugar beet, sunflower, soybean, oilseed rape, potatoes, hemp, cotton, flax, tobacco, hops, chicory, poppy and sorghum. From industrial plants, various products are obtained: sugar, vegetable oils, proteins, vegetable fibers, starch, spices, etc. All of them are used for direct use as human food or for further industrial processing to obtain various industrial products such as: margarine, vegetable fat, confectionery, fruit juices, canned fruit, protein products that replace meat, alcohol, yeast, beer and medicines. Some by-products from the field or from industrial processing are good fodder.

According to the purpose, ie the main product, industrial crops are divided into several groups:

1) Oil plants: sunflower, rapeseed, soybean, poppy and castor bean,
2) Essential oil and medicinal plants,
3) Beautiful (textile plants): cotton, hemp, linen
4) Plants used for the production of sugar, starch and alcohol: sugar beet, potatoes, chicory
5) Other industrial plants, which include only tobacco and hops

The subjects of research in this paper are significant types of industrial crops in Vojvodina(oilseed rape, soybeans, sunflowers, sugar beets and tobacco). Their production characteristics (area, annual production and yields) were analyzed.

The goal of the research is to predict the structure of production in the coming period on the basis of adequate analysis in the past, as well as determining the tendencies of change of given parameters by using quantitative methods and to enable macro economy planning and choosing adequate measures of macro agromanagement which would improve the growth of industrial crops in Vojvodina.

There are a large number of papers in the literature that have dealt with the analysis and prediction of production and value parameters in agriculture. Novković et al. 2006 based on the analysis of time series using the ARIMA model, predicted price parity between wheat and mineral fertilizers. Mutavdžić et al. 2007 predicted the change of price parities between corn and fattening pigs using the same methodology. Mutavdzic et al. 2010 based on the analysis of time series, with the application of the ARIMA model have analyzed and predicted the behavior of price parity between the most important agricultural products. Vukelić, Novković 2009 have analyzed the economic results of milk production on large family farms of dairy cows. Husemann, Novković 2014 have formulated a quantitative model for multinational farm management. Ivanišević et al. 2015 have analyzed changes in the price of tomatoes in Serbia using the method of descriptive analysis. Based on the analysis, the behavior of the price in the following period is predicted. Mutavdzić et al. 2011 have analyzed the tendencies in vegetable

production in Serbia in the period from 2001-2010 and concluded that the total production of vegetables shows a significant increase, primarily due to increased yields. The increase in production ranged from 2% for garlic to 56% for peppers. Tendencies of increased production were present in tomatoes, peas, onions, peppers, beans, carrots and cucumbers. Decreased tendencies were present in potatoes and watermelons, while cabbage had a tendency to stagnate. Novković et al. 2013 have analyzed the tendencies of vegetable production in Vojvodina in the period 2001-2010. The harvested area of the analyzed significant types of vegetables showed a tendency to decrease, with the exception of peas, peppers and garlic. Yields of all analyzed types of vegetables, except tomatoes, as well as total production showed a significant increase in the first decade of the 21st century. Novković, Mutavdžić 2016 analyzed the price of beans in Serbia, using descriptive statistics. Based on the results of the analysis and application of the appropriate ARIMA model behavior of the price of beans in the coming period has been predicted. Mutavdzic et al. 2017 have comparatively analyzed the quarterly changes in price parity between wheat and corn in the Republic of Serbia and the Republic of Srpska in the period 2010-2015. The analysis showed that the prices of grain in the Republic of Srpska are significantly higher than in the Republic of Serbia.

Methods and data sources

The paper applies a descriptive analysis of the production characteristics of significant types of industrial plants in Serbia in the period from 2005 to 2019. Areas, production and yields of sunflower, soybean, oilseed rape, sugar beet and tobacco were analyzed. Based on the results of descriptive statistics, the values of production characteristics for the next five years (2020-24) were predicted. The forecast was made on the basis of extrapolation through the average annual rates of change (r) that were applied to the values of individual phenomena in the last year of the observed period (2019).

Average annual rates of change were calculated according to a formula:

$$G = \left(\frac{Y_n}{Y_1} \right)^{\frac{1}{n-1}}$$

and the average rate of change:

$$r = (G - 1)$$

where

r is the average annual rate of change

G is the average annual index of change

Y_1 is the absolute value of the first member of the time series

Y_n is the value of the last number of the time series

n is the length of the series (number of years).

Precise prediction is achieved by applying the appropriate ARIMA models. But, because , in this case a sufficiently long time series was not available, because in Serbian statistics there is a change in methodology since 2005, in this research is used change rate for prediction.

Data on production characteristics of selected types of industrial crop are taken from the database from the website of the Republic Statistical Office of Serbia.

Results

Analysis and prediction of sunflower production characteristics

Sunflower is the most common industrial plant in Vojvodina. Descriptive statistics of sunflower production parameters are presented in Table 1. The average area under sunflower in Vojvodina was about 173 thousand hectares which was about 90% of the total area under sunflower in the Republic of Serbia. The minimum areas under sunflower were showcased in 2007 and the maximum in 2018. Areas are relatively stable (moderate coefficient of variation) and tend to grow insignificantly, less than one percent per year.

The average yield of sunflower in the analyzed period was about 2.5 t/ha. The coefficient of variation was moderately high. The minimum yield was recorded in 2005 and the maximum in 2019. The yield has a high growth rate of over 4 %.

The average annual production of sunflower was at the level of about 444,000 t. The minimum production was recorded in 2007, and the maximum in 2018. Production shows large variations by years of the analyzed period and shows a tendency to increase at an average annual rate of over 5%.

Table 1. Descriptive analysis of sunflower production characteristics in AP Vojvodina (2015-19) Production parameters

Characteristic	Average Value	Interval of variation		Coefficient of variation(%)	Rate of change(%)
		Minimum	Maximum		
Hectares (ha)	173,290	145,593	219,415	11.01	0.53
Yields (t/ha)	2.54	1.8	3.4	17.53	4.64
Production (t)	444,275	279,179	686,988	26.62	5.18

Source: Own Calculations

The results of prediction of sunflower harvested areas, production and yield for the period from 2020 to 2024 are shown in Table 2. The areas under sunflowers will reach an area of 201,000 ha in 2024, which is 28,000 ha or 16% more than the average of the analyzed period. At the same time, it is 5,274 ha or 2.7% more than the area under sunflower in 2019.

In 2024, sunflower production is projected to exceed 850,000 t, which is 67% more than the average of the analyzed period, or 191,000 t, or almost 29% more than annual production sunflower in 2019.

It is predicted that the sunflower yield in 2024 will exceed 4.2 t/ha, which is 93% more than the average of the analyzed period, ie 800 kg or 24% more than the yield achieved in 2019.

Table 2. Forecast of sunflower harvested area, production and yield in Vojvodina (2020-24)

Year	Area (ha)	Production(t)	Yields (t/ha)
2020	197,059	700,703	3.55
2021	198,109	737,020	3.71
2022	199,165	775,220	3.88
2023	200,227	815,400	4.05
2024	201,294	857,662	4.23

Source: Own Calculations

Analysis and prediction of soybean production characteristics

Soybean was known in today's territory of Vojvodina at the beginning of the 19th centuryIn the last few decades, soybeans have significantly increased their area and production in Serbia, and Vojvodina is the main region for its cultivation.

In the analyzed period, soybean was the second most represented industrial plant and oilseed in Vojvodina. Descriptive statistics of soybean production parameters are given in Table 3. The average area under soybeans was about 160,000 t. This accounted for over 91% of the total soybean area in the Republic of Serbia. The minimum areas under soybean were recorded in 2005 and the maximum in 2019. Areas are slightly more variable than in sunflower (higher coefficient of variation). Areas under soybean tend to grow significantly by about four percent per year.

The average soybean yield was over 2.7 t/ha. The coefficient of variation was moderately high. The minimum yield was recorded in 2012 and the maximum in 2014. The yield recorded an insignificant growth rate, less than one percent.

The average annual production of soybeans was similar to the production of sunflowers and amounted to about 435,000 t thousand tons. Production has been very unstable over the years, both due to area variations and yield variations. The minimum production was recorded in 2012 and the maximum in 2019. The maximum annual was almost 2.5 times higher than the minimum in the analyzed period. Soybean production shows a tendency of high growth at an average annual rate of almost 4.5 %.

Table 3. Descriptive analysis of soybean production characteristics in AP Vojvodina (2015-19)

Production Parameters	Average Value	Interval of variation		Coefficient of variation (%)	Rate of change (%)
		Minimum	Maximum		
Area (ha)	159,852	125,705	213,477	14.43	3.83
Yield (t/ha)	2.71	1.7	3.6	18.15	0.72
Production (t)	435,499	266,801	656,428	25.81	4.45

Source: Own Calculations

The results of prediction of harvested areas, production and yield of soybean for the period from 2020 to 2024 are shown in Table 4. Areas under soybean will reach an area of nearly 258,000 ha in 2024 and exceed the areas under sunflower. In the near future, soybeans will be the most represented fodder plants in Vojvodina. The area under soybean in 2024 will be higher than the average of the analyzed period by over 60%. Compared to the last year, 2019, the area under soybeans in Vojvodina will be higher by over 44,000 ha, or by over 20%.

The prediction shows that in 2024 soybean production will exceed 780,000 t, which is 79% more than the average of the analyzed period, ie to be higher than in 2019 for 125,000 t, or 19%.

It is predicted that soybean yield in 2024 will reach the level of 3.2 t/ha. That is 18% more than the average of the analyzed period. Compared to the achieved soybean yield in the last, 2019 period of the analyzed period, it is more by 100 kg/ha, or 3%.

Table 4. Prediction of soybean harvested areas, production and yield in Vojvodina (2020-24)

Year	Area (ha)	Production(t)	Yields (t/ha)
2020	221,655	685,665	3.12
2021	230,147	716,205	3.14
2022	238,964	748,105	3.16
2023	248,119	781,425	3.18
2024	257,624	816,230	3.20

Source: Own Calculations

Analysis and prediction of oilseed rape production characteristics

Rapeseed is one of the three most important oilseeds in the world, and in some countries where others cannot be grown due to climatic conditions, it is also the most important oilseed plant. This oil plant is becoming especially relevant from the aspect of biofuel production.

In the analyzed period, oilseed rape was the third most important oil plant in Vojvodina. Descriptive statistics of oilseed rape production parameters are shown in Table -5. The average area under oilseed rape was about 16,000 ha (ten times less than soybeans and sunflowers). This accounted for about 83% of the total area under oilseed rape in the Republic of Serbia. The minimum areas under oilseed rape were recorded in 2005, and

the maximum in 2018. Areas under oilseed rape show an extremely high coefficient of variation, which is a consequence of the fact that this crop in Vojvodina began to be produced significantly only in 2007 (12,435ha) Therefore, the rate of change of areas (and annual production) of oilseed rape has been calculated only since 2007, in order to avoid unrealistic extrapolation coefficients. Areas show a tendency of significant growth of over six percent per year.

The average yield of oilseed rape was over 2.6 t/ha (similar to soybeans). The coefficient of variation was moderately high. The minimum yield was recorded in 2010 and the maximum in 2014. The yield has a moderate growth rate of almost three percent

The average annual production of oilseed rape was slightly less than 40,000 t. The variation of production (as well as the area) was very pronounced in the analyzed period, and the reason is that a significant penetration of oilseed rape into the fields of Vojvodina followed only in 2007. The minimum production was recorded in 2005, and the maximum in 2018. The maximum annual production was almost 3.3 times higher than the average production in the analyzed period. Rapeseed production shows a tendency of high growth at an average annual rate of over 8.5 %.

Table 5. Descriptive analysis of oilseed rape production characteristics (2015-19)

Production parameters	Average Value	Interval of variation		Coefficient of variation (%)	Rate of change (%)
		Minimum	Maximum		
Area (ha)	13,999	1,520	41,390	67.15	6.63*
Yield (t/ha)	2,65	2.0	3.3	15.40	2.69
Production (t)	38,815	3,016	126,612	75.06	8.51*

*2007-2019.

Source: Own Calculations

The results of prediction of harvested areas, production and yield of oilseed rape for the period from 2020 to 2024 are shown in Table -6. The area under oilseed rape will reach an area of 37,000 ha in 2024. Despite the high growth rate, the projected area per oilseed rape will not reach the maximum achieved in the analyzed period (41,390 ha, 2018). The area under oilseed rape in 2024 will be higher than the average of the analyzed period by over 160%. Compared to the last year, 2019, the area under oilseed rape in Vojvodina will be higher by over 10,000 ha, ie by almost 38%.

- The - prediction shows that in 2024, rapeseed production will exceed 115,000 t, which is almost three times more than the average of the analyzed period., ie to be higher than the production in 2019 by 125,000 t, or 19%. The projected production for 2024 is higher than the production of oilseed rape realized in 2019 by almost 39,000 t, or 50%. At the same time, the projected production in 2024 is 11,000 t, or 9% less than the maximum realized production of oilseed rape in the analyzed period in Vojvodina.

It is predicted that the oilseed rape yield in 2024 will reach the level of 3.2 t/ha. This is 20% more than the average of the analyzed period, ie it is 550 kg/ha. In comparison with the last analyzed year, the predicted yield of oilseed rape for 2024 is higher by 300 kg/ha, or 10%.

Table 6. Prediction of oilseed rape harvested areas, production and yield in Vojvodina (2020-24)

Year	Area (ha)	Production(t)	Yields (t/ha)
2020	28,655	83,223	3.12
2021	30,554	90,305	3.14
2022	32,580	97,990	3.16
2023	34,740	106,329	3.18
2024	37,044	115,378	3.20

Source: Own Calculations

Analysis and prediction of sugar beet production characteristics

Sugar beet is the second most important plant for sugar production in the world. It participates with about 40% in world sugar production, while the remaining 60% of sugar is made from sugar cane. Of the total world production of sugar from sugar beet, about 85% falls on Europe.

Descriptive statistics of sugar beet production parameters are shown in Table7. According to the presence on the surfaces, sugar beet is on the third place among industrial plants in Vojvodina. The average area under sugar beet was 60,000 ha. This accounted for as much as 96% of the total area under sugar beet in the Republic of Serbia. The minimum areas under sugar beet were recorded in 2015, and the maximum in 2006. Areas under sugar beet are characterized by a high coefficient of variation. Areas show a tendency to fall significantly at an average annual rate of over three percent.

The average yield of sugar beet was over 48 t/ha. The coefficient of variation was moderately high. The minimum yield was recorded in 2012, and the maximum in 2014. The maximum yield was over 50% higher than the minimum. The yield recorded a weak growth rate, less than one percent.

The average annual production of sugar beet was slightly less than 3,000,000 t. The variation of production (as well as the area) in the analyzed period was very pronounced, as evidenced by the high coefficient of variation. The minimum production of sugar beet was recorded in 2015 and the maximum in 2010. The maximum annual production was 63% higher than the minimum, ie 23% higher than the average production in the analyzed period. Sugar beet production shows a tendency of moderate decline at an average annual rate of almost 2.5 %.

Table 7. Descriptive analysis of sugar beet production characteristics in AP Vojvodina (2015-19)

Production Parameters	Average Value	Interval of variation		Coefficient of variation (%)	Rate of Change (%)
		Minimum	Maximum		
Area (ha)	60,055	41,937	83,292	19.81	-3.23
Yield (t/ha)	48.28	36.00	54.90	10.29	0.79
Production (t)	2, 871. 686	2, 178. 487	3, 542. 521	16.30	-2.47

Source: Own Calculations

The results of prediction of harvested areas, production and yield of sugar beet for the period from 2020 to 2024 are shown in Table 8. The area under sugar beet in 2024 in Vojvodina will fall to the level of about 36,000 ha. That surface

is at the level of 60% of the average areas in the analyzed period. Areas under sugar beet will be less than the average by over 24 thousand acres, ie less by more than 6,000 ha than the minimum harvested area in the period 2005-2019. Practically, it is predicted that in 2024 the harvested area under oilseed rape will be larger than the harvested area under sugar beet.

The prediction shows that in 2024, sugar beet production will fall to the level of about 2 million tons. That is 1,500,000 t less than the maximum production, 800,000 t less than the average and 270,000 t less than in 2019. Expressed in relative terms, sugar beet production will fall to the level of 57% of maximum production, 70% to the level of average production, ie to the level of 88% of production in 2019.

It is predicted that the sugar beet yield in 2024 will reach the level of 56.5 t/ha. This is 3% (1.6 t) more than the maximum yield, 17% (8.2 t) more than the average yield, or 4% (2.2 t) more than the realized yield in 2019.

Table 8. Prediction of sugar beet harvested areas, production and yield in Vojvodina (2020-24)

Year	Area (ha)	Production(t)	Yields (t/ha)
2020	40,890	2,239,368	54.73
2021	39,568	2,184,145	55.16
2022	38,288	2,130,284	55.59
2023	37,051	2,077,751	56.02
2024	35,853	2,026,514	56.46

Source: Own Calculations

Analysis and prediction of tobacco production characteristics

Tobacco, unlike other analyzed industrial plants, is not used for food or energy. After drying, sorting and fermentation, tobacco leaves serve as the basic raw material for making cigarettes, cigars, pipe tobacco and other means of enjoyment. Of the chemical constituents of the leaves, the most important is nicotine, a highly toxic alcaide, which, when smoked or otherwise introduced into the human body, in moderation, has a calming or irritating effect, depending on the condition of the nervous system. Other leaf ingredients also contribute to the enjoyment of tobacco: ether ointment, resins and others. Growing and processing tobacco achieves great economic benefits. Varieties of the following types of tobacco are widespread in our country: oriental aromatic cigarette, semi-oriental, American large-leaved and Central European large-leaved. About half of the total production is exported in processed form. Tobacco cultivation intensively uses land that is less suitable for other plants, mainly due to the relief and lower fertility.

Descriptive statistics of tobacco production parameters are shown in Table9. The average area under tobacco in the observed period in Vojvodina was about 3,500 ha . This accounted for about 57% of the total harvested area under tobacco in the Republic of Serbia. The minimum areas under tobacco were recorded in 2010 and the maximum in 2007. Areas under tobacco are characterized by a moderate coefficient of variation. The maximum areas were over 50% larger than the minimum. Areas under tobacco show a tendency of slight growth at an average annual rate above one percent.

The average yield of tobacco was over 1.5 t/ha. The coefficient of variation was moderately high. The minimum yield was recorded in 2019 and the maximums in 2010 and 2014. The maximum yield was over 58% higher than the minimum. Tobacco yields recorded a moderate rate of decline, of about two percent. The yield in Vojvodina was about 100 kg higher than the national average.

The average annual production of tobacco was about 5,300 t. The variation of production in the analyzed period was similar to the variation of the area, of moderate intensity. The minimum tobacco production was in 2018, and the maximum in 2014, when one of the maximum tobacco yields was achieved.

The maximum annual production was about 44% higher than the minimum, ie 22% higher than the average production in the analyzed period. In the total tobacco production in Serbia, Vojvodina participated on average with about 62%. Tobacco production shows a tendency to fall slightly, at an average annual rate of less than one percent.

Table 9. Descriptive analysis of tobacco production characteristics in AP Vojvodina (2015-19)

Production Parameters	Average Value	Interval of variation		Coefficient of variation (%)	Rate of change (%)
		Minimum	Maximum		
Area (ha)	3,453	2,858	4,325	10.19	1.15
Yield (t/ha)	1.55	1.2	1.9	12.87	-2.02
Production (t)	5,345	4,546	6,538	10.82	-0.65

Source: Own Calculations

The results of prediction of harvested areas, production and yield of tobacco for the period from 2020 to 2024 are shown in Table 10. In 2024, the area under tobacco in Vojvodina will reach the level of four thousand acres. This area is 550 ha, or 16% larger than the average area in the analyzed period. The projected areas under tobacco in 2024 will be higher by 220 ha, or 5.5% of those achieved in 2019. The projected areas will not reach the maximum areas achieved in the analyzed period. It will be 320 ha less.

The prediction shows that in the forecast period, the annual tobacco production will fall by 120 t, and in 2024 it will fall to the level of about 4,500 t. This is about 850 t less than the average, or 2,500 t of maximum tobacco production in the analyzed period. Compared to 2019, tobacco production in 2024 will be lower by 670 t. Expressed in relative terms, tobacco production will fall to the level of 60% of maximum production, 75% to the level of average production, and to the level of 86% of production in 2019.

It is predicted that the tobacco yield in 2024 will symbolically fall by 40 kg/ha compared to 2019. That is, it is less by 390 kg/ha than the average, or 740 kg/ha less than the maximum yield of tobacco achieved in Vojvodina in the analyzed period. Expressed in relative indicators, the yield of tobacco will fall to the level of 61% of the maximum yield, 75% to the level of the average yield, ie to the level of 97% of the yield achieved in 2019.

Table 10. Prediction of tobacco harvested areas, production and yield in Vojvodina (2020-24)

Year	Area (ha)	Production(t)	Yields (t/ha)
2020	3,826	4,642	1.19
2021	3,870	4,612	1.18
2022	3,915	4,582	1.18
2023	3,959	4,552	1.17
2024	4,005	4,523	1.16

Source: Own Calculations

Discussion and Conclusion

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

- Sunflower has a tendency to increase production, area and yield. The average area was 173.000 ha, the average yield was 2.5 t/ha, and the average production was 444,000 t. In 2024, an area of 201,000 t, a yield of 4.2 t/ha as well as production in the amount of 858,000 t is projected. The upward trend is present in all three production parameters (area, production and yield).

- Soybeans show a tendency to increase area, production and yield. The average area was 160,000 ha, the average yield was 2.7 t/ha, and the average production was 435,00 t. It is predicted that in 2024 the area under soybeans will be 258,000 ha, the yield at the level of 3.2 t/ha, the production will amount to 816,000 t. This means that in 2024 the expected area under soybeans will be larger than the area under sunflowers, ie that soya will be the densest industrial crop in Vojvodina.

- Oilseed rape has a very high tendency to increase area, production and yield. The average area was 14,000 ha the average yield was 2.6 t/ha, and the average production was 39.000 t. In 2024, the projected area under oilseed rape will be 37,000 ha, production 115,000 t and a yield of 3.2 t/ha. This means that in 2024 the area of oilseed rape will be larger than the area under sugar beet, and it will take third place in terms of harvested areas of industrial plants in Vojvodina.

- Sugar beet shows a tendency to decrease areas and production, but also an increase in yield. The average area was 60,000 ha, the average yield was 48.3 t/ha, and the average annual production was at the level of 2.9 million tons. In 2024, it is projected to reduce the area to the level of 36,000 ha, yield at the level of 56.5 t/ha and production of about 2,000,000 t. This means that in 2024, the projected area of sugar beet will be smaller by the area under oilseed rape, ie in the fourth place in terms of representation of industrial plants in Vojvodina.

- Tobacco shows a tendency to decrease yields and production, while an increase in areas is noticeable. The average area for the period from 2005 to 2019 is 3,450 ha, the yield was 1.6 t/ha, and the production was 5,300 t. In the last year of forecasting (2024), it is predicted that the area will increase to 4,000 ha, the yield will fall to the level of 1 t/ha, and for production it will fall to the level of 4,500 t.

Conflict of interests

The authors declare no conflict of interest.

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THE IMPACT OF FOOD AND WINE HARMONIZATION ON THE EXPERIENCE AND FUTURE INTENTIONS OF THE GUEST

Ivana Ćirić[1], Dragan Tešanović[2], Vesna Vujasinović[3], Miloš Ćirić [4]

**Corresponding author E-mail: jankovic.ivanaaa@gmail.com*

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ABSTRACT

In order to find out whether the guests like to pair food and wine, a research was conducted on the basis of experiences on harmonization of food and wine in Belgrade. The aim of the research was to determine whether sociodemographic characteristics influence the factors of gastro-oenological offer. In order to contribute to the development of catering facilities and their offerings, one of the main research factors was the factor of future intention to revisit and verbally promote the restaurant. A structured field survey questionnaire was conducted on a sample of 226 guests of catering facilities on the territory of Belgrade. The generated data was processed by the SPSS software package, including MANOVA analyzes and descriptive statistics. The obtained results show that sociodemographic characteristics influence the selection of gastro-oenological offer and experience related to the harmonization of food and wine and future intentions.

Introduction

The interest in food and wine dates from the 18th century, and recent raising interest in their harmonization increases the demand for improving the offer in hospitality facilities

1 Ivana Ćirić, Teacher, High School of Tourism Novi Beograd, Otona Župančiča 4, Belgrade, Serbia., Phone: +381690213377, E-mail: jankovic.ivanaaa@gmail.com, ORCID ID (https://orcid.org/0000-0002-4758-5160)

2 Dragan Tešanović, Full Professor, Department of Geography, Tourism and Hotel Management, Faculty of Sciences, Trg Dositeja Obradovića 3, Novi Sad, Serbia, Phone: +38163541436, Email: dragan.tesanovic@dgt.uns.ac.rs, ORCID ID (https://orcid.org/0000-0003-1675-5654)

3 Vesna Vujasinović, Assistant Professor, Department of Geography, Tourism and Hotel Management, Faculty of Sciences, Trg Dositeja Obradovića 3, Novi Sad, Serbia, Phone: +381 21 485 2884, E-mail: vesna.vujasinovic@dgt.uns.ac.rs, ORCID ID (https://orcid.org/0000-0001-7307-2126)

4 Miloš Ćirić, Teacher, The College of Hotel Management, Academy of Vocational Studies Belgrade, Kneza Višeslava 70, Belgrade, Serbia, Phone +381638336873, E-mail: milos.ciric.gastronom@gmail.com, ORCID ID (https://orcid.org/0000-0003-4182-448X)

(Lecat, Chapuis, 2017). Wine tourism provides an unforgettable experience for every visitor to a destination (Brochado et al., 2021). Gastronomy has become very popular in the tourism industry (Santich, 2004), while in our country its inportance has been rasing recently. The absolute rules for pairing wine and food are not defined, therefore the recommendations of gastronomes are considered as a very important segment (Lecat, Chapuis, 2017). Recommendations for pairing food and wine guarantee quality and success, both in the catering facility and in retail (Paulsen et al., 2014). The main focus should be on the choice of wine and the preparation of various gastronomic specialties, and one of the principle rules of pairing is to use exclusively the same wine for food preparation and consumption (Mačević, Todorović, 2005).

Wine is an alcoholic beverage produced by the fermentation of grapes, the fruit of the vine plant (lat. Vitis Vinifera), but it can also be obtained from other fruits (sometimes from cereals). It represents one of the most popular alcoholic beverages in the world, and it is also seen as one of the most important ingredients in European and all Mediterranean cuisines (Beckett, Lingwood, 2005).

Gastro-oenology deals with the harmonization of food and wine in hospitality facilities, and is integrated so that the harmony and elemental pairing of food and wine are adequate. The biggest focus in the field of gastronomy is on the specification of wine and its presentation to the guest, i.e. quality presentation, which will provide the guest with an incentive to choose a gastronomic product and supplement their own choice with appropriate wine (Beckett, Lingwood, 2005). Janković et al. (2021) point out that restaurants and other catering facilities should be adapted to the wishes of consumers.

The paper aims to determine whether the socio-demographic characteristics such as gender, marital status, age, education and occupation affect both gastronomic offerings and experience in food and wine harmonization and their future intentions. The main research questions are:

Q1: Does the gender of the respondents influence the factors of the gastro-oenological offer of Belgrade?

Q2: Does the age of the respondents affect the factors of Belgrade's gastronomic offer?

Q3: Does the level of education affect the factors of gastro-oenological offer in Belgrade?

Q4: Does the marital status of the respondents affect the factors of Belgrade's gastronomic offer?

Q5: Does the occupation of the respondents influence the factors of Belgrade's gastro-oenological offer?

Based on the research questions, the basic hypothesis of the paper is:

H: Socio-demographic characteristics affect the choice of gastro-oenolic offer and experience regarding the harmonization of food and wine and their future intentions.

Pairing of food and wine

Pairing of food and wine is an extremely complex process, and studies that have dealt with this topic have proven that there are disagreements between experts and lay examiners. Namely, experts claim that not everyone can be a person who understands the structure and specification of food and wine, but that there are certain trained and qualified people who deal with this for many years (Bastian et al., 2009). The combination of food and wine can be approached from several different angles, which makes this process even more complex and important to learn (Harrington, 2005). Harmonization also depends on the goals or in other words why individuals decide to visit one catering facility. Individuals come to catering establishments for work, some do it for fun and enjoyment, so the threshold of harmonization is different. There are studies that revealed that there is a difference between enjoying and harmonizing food and wine (Meillon et al, 2010). Therefore, the proposal to link wine to food could reduce the financial and social risks associated with ordering wine. On this basis, it is assumed that the proposal to pair wine with food is a direct sale in restaurants (Wansink et al., 2006). People have been enjoying and experimenting with food and wine combinations for years, and research has shown that consuming wine can increase guest satisfaction in a restaurant and thus contributes to coming back to the same restaurant (Bastian et al., 2010). Popovic et al., (2020) points out that the agri-food sector in the countries of the Western Balkans deserves special attention due to coronavirus pandemic based on the conjunction that the agri-food sector is in big trouble.

Experiences related to consumption significantly affect the guest's experience of a destination and loyalty tourists who want to experience the gastroeniological experience (Kustos et al., 2021).

Increasing consumer interest in pairing food and wine suggests that the booming desire to consume food and wine. Empirical research has also been conducted on this topic, with the aim of researching which combinations of food and wine are the best and why. Also, there isn't much information about the preferences of individuals with limited knowledge of pairing food and wine. This knowledge is crucial and that is why relevant industries must be better educated in a way that is both consumer-friendly and profitable for the industry. Studies such as these largely contribute to future research ideas and suggestions on the topic of pairing of food and wine. Each person can recommend food and wine and choose the appropriate combination, and since individuals with more experience in pairing food and wine have assessed that some combinations have better profitability for the restaurant and other catering facilities, they decide to visit the restaurant again and pair food and wine (Koone et al., 2014).

Oenology and gastronomy are closely related, because without gastronomic passion there is no real love for wine. Wine can be tasted and evaluated beyond meals, but it is indisputable that wine and food are complementary. The pairing of food and wine is successful only if both gain quality in it. Wine is properly consumed right after first swallowed bite of food, where that sip of wine should complete its taste. This way of

consuming wine really requires knowledge of stacking wine and food, which is very important. There is no factor such as 'personal taste' except in the case of delicious aromas, which are important, but not the most important factor in the arrangement of food and wine (Šijački, 2004).

In order to get acquainted with the rules by which food and wine are paired, it is first necessary to clarify what can be felt in the mouth, and what is most important for matching wine with food, because no matter how food is prepared, certain tastes always come to the front side. There are six key tastes of food: salty, sour, bitter, spicy, smoked and sweet, i.e. two ways of pairing: pairing food of the same or opposite taste (Ninković, 2007).

Influence of socio-demographic factors on food consumption

The development depends on the integrated guests' feedback which led to many changes made by entrepreneurs as well as organizations in recent years. Over time, it has been suggested that feedback should be obtained in order to be able to possess insights from your guests, especially online where the perfect example would be comments on the map. Tourism is one of the most important sources of income and a significant factor of economic stability, because it contributes to the increase and inflow of new jobs (Dašić et al., 2020).

Socio-demographic factors typically include indicators such as gender, age, marital status, level of education, occupation, and household income to maintain the socioeconomic and demographic status of individuals. Although closely related to cultural background, socio-demographic factors allow the study of socio-economic and demographic variables within the cultural determinants of food consumption (Pizam, Sussmann, 1995). Research suggests that tourist food consumption may be heavily influenced by socio-demographic factors: research results have found that guest age is negatively correlated with the number and scope of their culinary research (Tse, Crotts, 2005). This suggests that older guests can consume a shortlist of available food and wine (Kim et al., 2009). Besides this, identified gender, age, and education are shown as three sociological-demographic variables that affect food and wine consumption. Specifically, it was concluded that female respondents are more interested in harmonization than male respondents. Older respondents and respondents with a higher level of education are more concerned about health, and have a stronger desire to understand and experience a foreign culture through harmonization. In research, conducted up to now, the results suggest that women are more likely to engage in food or wine-related activities than men are (Ignatov, Smith, 2006). Women are more price sensitive than men and at the same time more willing to try unknown or unusual fruits and vegetables (Mitchell, Hall, 2004).

Income is directly related to the status and the occupation. The results of a Canadian study showed that guests who have professional and expert occupations, participate more in wine and gastronomic tourism than other employees. Guests, who are involved in food and wine activities, compared to those who are only interested in food or only wine, had a higher percentage of retirees (Ignatov, Smith, 2006).

Food and beverage consumption

Tourists' interest in food and wine has progressed significantly over the years, with more and more people who wants to have a real experience while consuming (Rachão et al., 2021).

Food consumption is the most important form of consumption, but it is largely neglected in the hospitality and tourism's literature. So far, no research on this topic has been conducted in the Republic of Serbia, but only research that includes examining the quality of hotel services (Blešić et al., 2014). The position of the wine on the list or menu also affects the sale of wine. Food and drinks are sometimes presented in two different menus or one after the other (Terrier, Jaquinet, 2016).

In order to provide the right level of comfort in restaurants, it is necessary to ensure that the conversation at one table can be held in a mutually understandable way, all in order to avoid background noise from conversations at neighbouring tables (as a rule, the level of exposure in ambience in such rooms, has proven that noise from external sources is negligible). When you host several groups of customers at the same time, restaurants are affected by a very unpleasant background noise, which forces each speaker to raise their voice in an effort to hear people sharing the same table, and thus intimacy is guaranteed to the guest. Harmonization requires peace and harmony at the table for the guest to enjoy (Leccese et al., 2015). The Internet is currently considered the best tool that can also help build the image of both restaurants and the harmonization of drinks and food culture (Ab Karim, Chi, 2010). Wine consumption and culture have been established over many centuries and date back to ancient times, when wine spread from its homelands to different parts of the world through trade and wars (Tang et al., 2015).

The price of food is quite problematic. The price factor is important in decision making process when it comes to the selection of wine and food, whether buying local or foreign wine. Considering that today people have less and less time to prepare food, convenience - how to use - is more important than it has ever been before. The choice of food and wine depends on both availability and family habits. The choice of dishes is greatly influenced by the way in which they are prepared and marketed (Cohen, Avieli, 2004).

Food and wine consumption refer to the amount consumed, and is usually stated in terms of mass, energy value (kJ) or total amount of macro and micro nutrients in food and wine research (Logue, 2014). Previous research has shown that liking, preference, choice, and consumption are not adequate equivalents in terms of behaviour in food and wine consumption (Logue, 2014). In the literature, their relationship is described as follows: "taste is the main determinant of preference, and preference is the main determinant of consumption, but many other variables intervene (Rozin, 2006).

Materials and methods

During the period from December 2020 to July 2021 a field survey was conducted using a modified structured survey questionnaire (Jalis et al., 2009a; Jalis et al., 2009b)

on a total of 226 guests of catering facilities on the territory of Belgrade selected using the Trip-Advisor *app*. The structured questionnaire contained two parts, where the first part included a demographic description of the respondents, while the second part contained questions related the attitudes of the guests toward gastro-oenological offer and its impact on the guest's experience and future intentions. The questions were asked and evaluated on the basis of a five-point Likert scale (with grades from 1- strongly disagree, 2 – disagree, 3- undecided, 4 – agree, 5- strongly agree). The obtained results were statistically processed using the software package SPSS 22 (SPSS, 2013) which included analysis MANOVA and descriptive statistics.

Results and Discussions

In order to examine the differences in sociodemographic characteristics and habits in relation to the factors of gastro-oenological supply, the one - way MANOVA method (one way between MANOVA groups) was used. In all models, the dependent variables are factors of gastro-oenological offer: consumption of food and beverages, consumption of food and wine in restaurants in Belgrade, experiences related to the culture of food and wine harmonization, attractiveness of gastronomic offer, overall satisfaction and future intention of the guest to visit again or orally promote the restaurant. Dependent variables are operationalized as a sum of questions on subscales, which refer to a certain factor of gastro-enological offer.

Differences in the gender of the respondents in relation to the factors of gastro-enological offer

In terms of demographic indicators, it can be stated that in the sample, despite a slightly higher share of women among respondents compared to men (55,50% vs. 44,50%), respondents of both sexes were evenly represented. In Table 1 measures of central tendency and variability, by factors of gastro-oenological supply for males and females are presented.

Table 1. Descriptive statistics of gastroenterological supply factors by sex of respondents

		M	SD	N
Consumption of food and beverages	Female	23,4720	5,70735	125
	Male	24,7300	5,51189	101
Consumption of food and wine in restaurants in Belgrade	Female	30,0560	7,82604	125
	Male	30,8300	7,46447	101
Experiences related to the culture of food and wine harmonization	Female	35,1520	7,85663	125
	Male	36,1100	8,41103	101
Attractiveness of gastro-oenological offer	Female	14,4080	3,47130	125
	Male	14,1900	3,51245	101
Total satisfaction	Female	11,3280	2,22078	125
	Male	10,9900	2,43499	101
The future intention of the guest to revisit or verbally promote the restaurant	Female	7,1200	1,68772	125
	Male	7,2600	1,52832	101

Note: N—number of respondents, M—arithmetic mean, SD—standard deviation,
Source: Authors' research

It can be seen that females and males are uniformed in the assessment of gastroenterological supply factors. On average, males are more likely to consume food and drink (M = 24.73; SD = 5.51), consume food and wine in restaurants (M = 30.83; SD = 7.46), have more experience in relation to the culture of food and wine harmonization (M = 36.11; SD = 8.41) and have a greater future intention to revisit or verbally promote the restaurant (M = 7.26; SD = 1.53). Females, on average, have higher scores on the subscales of attractiveness of gastronomic offer (M = 14.41; SD = 3.47) and overall satisfaction (M = 11.33; SD = 2.22).

Based on the obtained results, it can be stated that the factor - food and beverage consumption as an option to visit a restaurant was more determined by male respondents, and somewhat less by female respondents. By looking at the table, the factor of food and beverage consumption as an option to visit a restaurant was more determined by male respondents, and less by female respondents. Factor of experience related to culture and harmonization of food and wine, a larger number of male respondents are keen to it than female respondents. The overall satisfaction as the overall impression of the guest was more determined by the female person, and less by the male person. The future intentions of the guest to revisit or orally promote the restaurant were more determined by the males and less by the females.

Differences in the age of the respondents in relation to the factors of gastro-oenological offer

In terms of age, the survey predominantly (73,1%) included respondents of younger age categories (up to 30 years), while the share of those older than 51 years is 4,4%. Table 2 shows the measures of central tendency and variability, by factors of gastro-oenological supply in relation to the age of the respondents.

Table 2. Descriptive statistics of gastro-oenological supply factors in relation to the age of the respondents.

		M	SD	N
Consumption of food and beverages	31-40	23,7500	5,76468	28
	41-50	25,1818	4,58399	23
	51 and more	26,1000	6,26188	10
	18-30	23,8000	5,71711	165
Consumption of food and wine in restaurants in Belgrade	31-40	28,0357	7,88098	28
	41-50	33,9091	6,54588	23
	51and more	31,9000	5,13052	10
	18-30	30,2424	7,76024	165
Experiences related to the culture of food and wine harmonization	31-40	33,6429	7,07743	28
	41-50	36,9545	6,83463	23
	51 and more	34,9000	9,44516	10
	18-30	35,7636	8,34317	165

		M	SD	N
Attractiveness of gastro-oenological offer	31-40	13,8214	3,33393	28
	41-50	14,9545	2,08115	23
	51 and more	13,9000	3,03498	10
	18-30	14,3333	3,68473	165
Total satisfaction	31-40	11,0357	2,61735	28
	41-50	11,0909	2,56179	23
	51 and more	11,3000	2,66875	10
	18-30	11,2061	2,23197	165
The future intention of the guest to revisit or verbally promote the restaurant	31-40	7,2857	1,60686	28
	41-50	7,2273	1,41192	23
	51 and more	6,9000	1,28668	10
	18-30	7,1758	1,67096	165

Note: N—number of respondents, M—arithmetic mean, SD—standard deviation,
Source: Authors' research

Based on Table 2 it is found that the respondents evaluate food consumption in the following way: Middle-aged respondents assign lower rates to the factors of food and beverage consumption (M = 23.75; SD = 5.76) and food and wine consumption in catering facilities in Belgrade (M = 28.04; SD = 7.88). The factor of future intention to revisit or verbally promote the restaurant is rated the lowest by the oldest respondents (M = 6.90; SD = 1.29). Factors, experience related to the culture of food and wine harmonization (M = 33.64; SD = 7.08), attractiveness of the gastro-oenological offer (M = 13.82; SD = 3.33) and overall satisfaction (M = 11.06; SD = 2.61) is rated the lowest by middle-aged respondents (from 31 to 40 years). The most satisfied are the respondents from 41 to 50 years of age. By analyzing the respondents, most of the survey was filled out by respondents aged 31 to 40 years. On average, it is considered that these are business people, who are employed, and that their assessment is extremely important for the future intentions and promotion of the restaurant.

Differences in the education of the respondents in relation to the factors of gastro-oenological offer

The obtained data indicate that a negligible number of respondents with completed primary school (3,1%) participated in the survey, the most represented were respondents with completed secondary school (33,5%) and vocational school (35,7%), and a significant share of respondents with completed academic studies (27,8%). Table 3 shows the measures of the central tendency and variability according to the factors of gastro oenological offer in relation to the education of the respondents.

Table 3. Descriptive statistics of gastro oenological supply factors in relation to education

		M	SD	N
Consumption of food and beverages	Vocational School	23,6790	5,68513	81
	Doctoral Studies - PhD	30,5000	3,10913	4
	Master or Master's Degree	21,6667	6,65081	21
	Primary School	27,2857	5,67786	7
	High School	24,9054	5,08602	74
	Faculty (Bachelor's')	23,1053	5,44153	38
Consumption of food and wine in restaurants in Belgrade	Vocational School	29,2593	7,01209	81
	Doctoral Studies - PhD	37,5000	8,96289	4
	Master or Master's Degree	28,4286	7,51380	21
	Primary School	41,2857	7,56559	7
	High School	31,7568	7,37788	74
	Faculty (Bachelor's')	28,5263	7,41706	38
Experiences related to the culture of food and wine harmonization	Vocational School	34,6667	7,91202	81
	Doctoral Studies - PhD	40,2500	11,87083	4
	Master or Master's Degree	31,6667	7,68332	21
	Primary School	45,4286	7,27684	7
	High School	37,1757	7,63438	74
	Faculty (Bachelor's')	34,2632	7,56122	38
Attractiveness of gastro-oenological offer	Vocational School	13,9506	3,53518	81
	Doctoral Studies - PhD	16,7500	1,70783	4
	Master or Master's Degree	12,5238	3,35588	21
	Primary School	17,8571	2,11570	7
	High School	14,9730	3,40013	74
	Faculty (Bachelors')	13,8684	3,22298	38
Total satisfaction	Vocational School	11,1852	2,08633	81
	Doctoral Studies - PhD	13,0000	1,15470	4
	Master or Master's Degree	11,0000	2,02485	21
	Primary School	10,7143	3,59232	7
	High School	11,5135	2,50612	74
	Faculty (Bachelor's')	10,5000	2,28686	38
The future intention of the guest to revisit or verbally promote the restaurant	Vocational School	7,2346	1,57537	81
	Doctoral Studies - PhD	8,5000	,57735	4
	Master or Master's Degree	6,8095	1,28915	21
	Primary School	8,1429	8,9974	7
	High School	7,2703	1,69849	74
	Faculty (Bachelor's')	6,7895	1,75773	38

Note: N—number of respondents, M—arithmetic mean, SD—standard deviation,
Source: Authors' research

According to results in Table 3 it can be stated that the factors of future intention to visit or orally promote the restaurant are well assessed by the respondents, which is of great importance for restaurants (M = 8.50; SD = 0.58). Factors - total satisfaction (M = 13.00; SD = 1.15) and consumption of food and beverages (M = 30.50; SD =

3.11) are mostly assessed by doctors of science, while the attractiveness of the gastro-oenological offer is assessed by a good grade (M = 16, 75; SD = 1.70) which has a very good effect on the image of the restaurant. The experience factor related to the culture of food and wine harmonization is rated slightly lower (M = 14.25; SD = 11.87). When it comes to the factor - food and wine consumption in catering facilities in Belgrade, it can be stated that the respondents rate it extremely high (M = 37.50; SD = 8.96), while the factor-food and beverage consumption is rated solidly (M = 30.50; SD = 3.10). Based on the obtained results, it can be stated that the respondents best assess the factor of food and wine consumption in catering facilities in Belgrade.

Consumption of food and wine in catering facilities in Belgrade (M = 41.29; SD = 7.57) and experiences related to the culture of harmonization of food and wine (M = 45.43; SD = 7.27), attractiveness of gastronomic offer (M = 17.85, SD = 2.12) are mostly rated by respondents with primary education. Factors food and beverage consumption (M = 27.28; SD = 5.67), overall satisfaction (M = 10.71; SD = 3.59), future intention to revisit or promote the restaurant (M = 8.14; SD = 8.99) are the factors that are most assessed by respondents with doctoral education.

Respondents with a university degree rate well the factor - food and beverage consumption (M = 23.10; SD = 5.44), food and wine consumption in catering facilities in Belgrade (M = 28.52; SD = 7.41), while experiences in relation to the culture of food and wine harmonization (M = 34.26; SD = 7.56) are rated as one of the best factors. Factors assess the attractiveness of the gastro-enological offer (M = 13.87; SD = 3.22) solidly; overall satisfaction (M = 16.50; SD = 2.28) is evaluated worse than the previous factors and the factor future intention of the guest to revisit or verbally promote the restaurant (M = 6.78; SD = 1.75) is rated very poorly by the respondents.

Respondents with secondary education rate food and beverage consumption well (M = 24.90; SD = 5.08), and all of these results can contribute to encouraging restaurants for future purposes. Respondents rate the factor of food and wine consumption in catering facilities in Belgrade with an average grade (M = 31.75; SD = 7.37), experiences related to the culture of food and wine harmonization with a very high grade (M = 37.17; SD) = 7.63), and based on these results it can be concluded that most respondents answered that the reason for visiting the restaurant is related to the experience with culture and harmonization of food and wine. The factor of attractiveness of the gastro-oenological offer as a factor of restaurant visit is rated lower (M = 14.97; SD = 3.40), overall satisfaction (M = 11.51; SD = 2.50) is rated significantly lower by the respondents. Future intention of the guest to revisit or verbally promote a restaurant which is not good for restaurant policy (M = 7.27; SD = 1.69) is rated by respondents as extremely low. Many existing studies have shown future intentions to visit the festival among visitors tasting food and wine and the overall experience of local potential hundred certainly contributes to the local population (Masella et al., 2021).

Respondents with master studies evaluate the factor of food and beverage consumption with a solid grade (M = 21.66; SD = 6.65), the factor of food and wine consumption in

catering facilities in Belgrade (M = 28.42; SD = 7.51) with a high grade, experiences related to the culture of harmonization of food and wine (M = 31.66; SD = 7.63) are rated extremely high, which is good for the further development of the restaurant. The attractiveness factor of the gastro-enological offer (M = 12.52; SD = 3.35) was not assessed well by the respondents, and based on that it can be concluded that the offer was not completed. Overall satisfaction (M = 11; SD = 2.02) is not well rated, which means that restaurants must work harder on the overall impression of the guest, while the factor is the future intention of the guest to revisit or verbally promote the restaurant (M = 6.80; SD = 1.28) rated very poorly.

Respondents with higher education rate food and beverage consumption well (M = 23.67; SD = 5.68), factors of food and wine consumption in catering facilities in Belgrade (M = 29.25; SD = 7.01) and experiences in in relation to the culture of harmonization of food and wine, they rate extremely well (M = 34.66; SD = 7.91), the attractiveness of the gastro-oenological offer is assessed by the respondents with a worse grade (M = 13.95; SD = 3.53), overall satisfaction (M = 11.18; SD = 2.08) and the factor future intention of the guest to revisit or verbally promote the restaurant (M = 7.23; SD = 1.57) was assessed by the respondents as extremely bad. Based on this analysis, it can be concluded that to a large extent the visit to the restaurant and the choice to consume and harmonize food and wine depends on the level of education.

Differences on marital status of the respondents in relation to the factors of gastro-oenological offer

In terms of demographic indicators, it can be stated that sample has a similar share (about 30%) of single, married and respondents in a relationship. In Table 4 measures of central tendency and variability, according to the factors of gastro-oenological offer in relation to the marital status of the respondents are presented.

Table 4. Descriptive statistics of gastro-oenological quality factors by marital status of respondents

		M	SD	N
Consumption of food and beverages	Living with a partner	24,8889	5,41120	18
	Married	24,2459	6,37091	61
	Single	23,6944	5,68328	72
	In a relathionship	23,9730	5,08011	74
Consumption of food and wine in restaurants in Belgrade	Living with a partner	32,6667	7,12081	18
	Married	30,7869	8,26461	61
	Single	30,0694	7,73200	72
	In a relationship	29,8514	7,22189	74
Experiences related to the culture of food and wine harmonization	Living with a partner	36,3333	7,05441	18
	Married	35,6721	9,22627	61
	Single	34,7083	8,45608	72
	In a relationship	36,1622	7,01081	74

		M	SD	N
Attractiveness of gastro-enological offer	Living with a partner	15,4444	3,32941	18
	Married	14,3443	3,65552	61
	Single	13,9444	3,59925	72
	In a relationship	14,3649	3,25860	74
Total satisfaction	Living with a partner	12,3889	1,75361	18
	Married	10,9016	2,61218	61
	Single	11,0972	2,38044	72
	In a relationship	11,1892	2,05856	74
The future intention of the guest to revisit or verbally promote the restaurant	Living with a partner	7,5556	1,38148	18
	Married	7,1475	1,60038	61
	Single	7,0278	1,75204	72
	In a relationship	7,2703	1,55535	74

Note: N—number of respondents, M—arithmetic mean, SD—standard deviation,
Source: Authors' research

In Table 4, it can be noticed that, on average, respondents who are in a relationship, give higher marks to the factors of the quality of the gastro-enological offer. The highest assessment of food and beverage consumption is given by respondents who are In a relationship (M = 24.89; SD = 5.41), and the lowest by singles (M = 23.69; SD = 5.68), consumption of food and wine in catering facilities in Belgrade are mostly practiced by respondents who are In a relationship (M = 32.67; SD = 7.12), and the least by respondents who are related (M = 29.85; SD = 7.22), experience related to by harmonizing food and wine, respondents who are In a relationship have the most (M = 36.33; SD = 7.05), and singles have the least (M = 34.71; SD = 8.46). The situation is the same with the assessment of the attractiveness of the gastro enological offer. It is rated the highest by respondents who are in an extramarital union (M = 15.44; SD = 3.33), and the lowest by singles (M = 13.94; SD = 3.60). The experience of total satisfaction is mostly experienced by respondents who are in a relationship (M = 12.39; SD = 1.75), and the least married or married respondents (M = 10.90; SD = 2.61). The future intention to revisit or verbally promote the restaurant is highest among respondents who are out of wedlock (M = 7.55; SD = 1.38), and lowest with respondents who are single (M = 7.03; SD = 1.75).

Differences in the occupation of the respondents in relation to the factors of gastro-enological offer

In terms of occupation, the survey predominantly (60,4%) included employed respondents, while the share of those unemployed was 14,5% The significant share of 23,3% of respondents were students. Table 5 shows the measures of central tendency and variability by factors of gastro-enological supply in relation to the occupation of the respondents.

Table 5. Descriptive statistics of quality factors of gastro-enological offer in relation to occupation

		M	SD	N
Consumption of food and beverages	Employed	24,7407	5,45123	135
	Unemployed	22,1212	5,33712	33
	Student	23,1132	6,07853	53
Consumption of food and wine in restaurants in Belgrade	Employed	30,8889	7,27874	135
	Unemployed	29,9394	6,83255	33
	Student	28,9623	8,78802	53
Experiences related to the culture of food and wine harmonization	Employed	35,4519	7,85001	135
	Unemployed	35,4848	7,04947	33
	Student	35,2453	8,92685	53
Attractiveness of gastro-oenological offer	Employed	14,4519	3,21080	135
	Unemployed	14,1212	3,96672	33
	Student	13,9623	3,91723	53
Total satisfaction	Employed	11,3778	2,21550	135
	Unemployed	11,2121	2,50945	33
	Student	10,9057	2,33093	53
The future intention of the guest to revisit or verbally promote the restaurant	Employed	7,4296	1,57186	135
	Unemployed	7,3030	1,48923	33
	Student	6,5472	1,65908	53

Note: N—number of respondents, M—arithmetic mean, SD—standard deviation,
Source: Authors' research

Based on the research, looking at Table 5 it can be stated that employees best assess the factor of food and beverage consumption (M = 24.74; SD = 5.45), factors of food and wine consumption in catering facilities in Belgrade (M = 30, 89; SD = 7.28), attractiveness of gastro-enological offer (M = 14.45; SD = 3.21), overall satisfaction (M = 11.38; SD = 2.21) and future intention to revisit or promote restaurant (M = 7.43; SD = 1.57) is most evaluated by employed respondents and experiences related to the culture of food and wine harmonization are mostly evaluated by unemployed respondents (M = 35.48; SD = 7.05).

The unemployed rate slightly worse factors in the consumption of food and beverages (M = 22.12; SD = 5.33), the consumption of food and wine in catering facilities in Belgrade is assessed very well by respondents (M = 29.93; SD = 7.04), Experiences related to culture and food and wine harmonization are rated by the unemployed as very high (M = 35.48; SD = 7.04), the attractiveness of the gastronomic offer is assessed by the respondents as slightly lower (M = 14.12; SD = 3 , 96), the overall satisfaction (M = 11.23; SD = 2.50) and the factor of future intention to visit the restaurant again and promote it orally (M = 7.30; SD = 1.48) were assessed by the respondents as extremely bad.

Based on the research conducted by students, the following results were obtained: the factor of food and beverage consumption was evaluated with a solid grade, which is a good sign for future visits to restaurants (M = 23.11; SD = 6.07), consumption of food

and wine in restaurants in Belgrade (M = 28.96; SD = 8.78) rated good, experiences related to culture and harmonization of food and wine (M = 35.24; SD = 8.92) respondents rated very well, the attractiveness of gastro-enological offers (M = 13.96; SD = 3.91), overall satisfaction (M = 6.90; SD = 2.33) and future intentions to visit the restaurant again and promote it orally (M = 6.54; SD = 1.65) respondents did not rate well, based on which it can be concluded that respondents do not intend to visit or promote the restaurant in the future. The research shows that the respondents, who are employed, are very frequent guests of the restaurant and this proved to be a good indicator for the long-term operation of the restaurant and regular guests.

Conclusion

The raising interest in harmonization of food and wine increases the demand for improving the offer in hospitality facilities. In order to find out whether sociodemographic characteristics influence the factors of gastro-oenological offer a structured field survey questionnaire was conducted on a sample of 226 guests of catering facilities on the territory of Belgrade. After the analysis of the obtained data, the following can be concluded, which gives the answer to the set of research questions:

- Analyzing the impact of gender differences in relation to gastro-oenological supply factors, it can be concluded that males emphasize a higher level of agreement in almost all factors compared to females, except for factors on overall satisfaction where females stand out with a higher degree of agreement in relation to male respondents.

- Differences in marital status are very diverse. People out of wedlock value food and beverage consumption, food and wine consumption in restaurants, experience in the culture of food and wine harmonization, attractiveness of gastronomic offer and overall satisfaction, while the factors of future intentions of the guest to visit or promote orally restaurant respondents have the highest degree of agreement.

- Taking into account differences based on the age of the respondents, the highest degree of agreement occurs in the group of respondents aged 31-40, while the lowest level of agreement in all factors has the group of respondents aged 18-30.

- The level of education is crucial for expressing the opinion. according to the results the respondents with completed doctoral studies express the highest degree of agreement in all factors. The lowest degree of agreement with the factors is diverse. Respondents with a master's or master's degree express the lowest degree of agreement in the factors of food and beverage consumption, food and wine consumption in Belgrade's catering facilities, experience in the culture of food and wine harmonization and the attractiveness of gastronomic offer. While the lowest degree of agreement with other factors such as overall satisfaction and future intentions to revisit or verbally promote the restaurant occurs with respondents with a university degree or Bachelor's'.

- Considering differences in occupation of respondents, it can be concluded that respondents who are employed evaluate all factors more than the factor of experience

related to the culture of food and wine harmonization, where the highest level of agreement have unemployed. When we talk about the lowest degree of agreement, the lowest level of agreement is very diverse. The unemployed point out the lowest level of agreement with the factors of food and beverage consumption, while students express a lower level of agreement with other factors.

Based on the conducted research and the basic hypothesis, it is confirmed that the sociodemographic characteristics of guests of catering facilities affect the choice of gastro-oenolic offer and experience regarding the harmonization of food and wine and their future intentions.

Conflict of interests

The authors declare no conflict of interest.

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THE MAIN DEMOGRAPHIC CHARACTERISTICS OF CUSTOMERS AND THE FREQUENCY OF PURCHASES ORGANIC FOOD

Vladimir Mitić[1], Milica Čolović[2]

**Corresponding author E-mail: vmitic@singidunum.ac.rs*

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ABSTRACT

The essential research goal is to determine the frequency of purchases organic food in general and the basic demographic characteristics of typical buyers of organic food. Sample consists of 571 respondents of different sex, age, and educational level, area of living, material and marital status. The research was conducted online using a Google. The SPSS program was used for data processing. The Man Witney U and the Kruskal – Wallis tests were applied in order to determine the statistical significance of the obtained differences in scores between groups of subjects. The obtained results showed that the frequency of purchasing organic food in Serbia is still low. Typical buyers of organic food are mostly women, older, have higher education and income. They usually live in urban areas, in big cities, while their marital status seems to have no influence on their decision to purchase an organic food and products.

Introduction

The main goal of the research is to examine the basic characteristics of typical buyers of organic food in Serbia. In that sense, in addition to the general frequency of organic food purchases in Serbia, all important characteristics and differences that exist between people of different gender, age, educational level, rural or urban area, material and marital status are determined. Therefore, it is not surprising that there has been a large change in the orientation of agricultural producers in these countries and an increasing turn towards the production of organic food. As a result of that, about 33% of organic food produced comes from developing countries (Yadav, 2016).

The organic industry is one of the fastest growing sectors, and in the period from 2013

1 Vladimir Mitić, PhD student, Singidunum University, Faculty of Business in Belgrade, Danijelova 32, 11000 Belgrade, Phone: +381691133201, E-mail: vmitic@singidunum.ac.rs, ORCID ID (https://orcid.org/0000-0002-5488-0256)

2 Milica Čolović, Assistant professor, Singidunum University, Faculty of Business in Belgrade, Danijelova 32, 11000 Belgrade, Phone: +381642784078, E-mail: mcolovic@singidunum.ac.rs, ORCID ID (https://orcid.org/0000-0002-8393-2158)

to 2015 it recorded a growth of as much as 400% (Froehlich et al., 2018). Between 2000 and 2017, a demand for organic products has been increased by 330%, while the area of organic land has also been increased by 200%, as well as the value of the organic food market in 2017 has been astimated aproximately about $ 97 billion (Bazaluk, et al., 2020). Considering the fact that the Organic Food Market has a tendency of constant growth, in 2019 the value of this market amounted to 106 billion euros (IFOAM, 2021). In previous years organic food was present exclusively in the markets of the most developed countries, in order to gradually expand to third world countries market (Rana & Paul, 2017). In Serbia the organic food market could be described as small and very modest (März et al., 2012). This is indicated by the growth rate of the organic food market, that is only 2 to 3% per year that is very small, if we keep in mind that this market in the EU is growing by an average of 10 to 15% per year (Končar et al., 2019).

The crucial goal of this research is to determine the frequency of organic food purchases in general and the basic demographic characteristics of typical buyers of organic food. The group of authors conducted research on the socioeconomic status and characteristics of organic food buyers (Onyango et al., 2007). In 2003, the aforementioned researchers conducted 1201 randomly selected telephone interviews in the United States. The results showed that on that sample 44% of respondents are regular buyers of organic food (permanently or occasionally) while 56% of respondents rarely buy organic food. Organic buyers are more often women, younger buyers (18-32 years) and mostly have higher education and income, while religiosity, political affiliation and ethnicity do not influence the decision of purchaise an organic food. Similar results were obtained in 2006 in the USA on a sample of 44.000 households, in which the correlation among certain demographic characteristics and the probability of organic food purchases was examined (Dimitri & Dettmann, 2012). The results showed that factors such as higher income and education, marriage and easier approach to increasing of the organic food as well as the probability of organic food purchase.

In one study, in two large cities in Canada as a sample it was used 324 respondents, both in person (95%) and online (5%) (Hamzaoui-Essoussi & Zahaf, 2012). The results showed that regular consumers of organic products mostly live in city centers, work as professionals and have higher education and income, while occasional buyers of organic products mostly live in the suburbs and have lower income. As far as marital status is concerned, most consumers of organic products are in marriage and have 1 child. The results of the mentioned research showed that regular customers spend at least 100 dollars a month on organic products. However, other conducted research did not show that consumers from urban areas are more frequent buyers of organic meat than residents of rural areas in the UK (McEachern & Willock, 2004).

A large number of research have shown that a majority of women have positive opinion of organic food comparing to men (Lockie et al., 2002; McEachern & McClean, 2002; O'Donovan & McCarthy, 2002; Storstad & Bjørkhaug, 2003; Diamantopoulos et al., 2003; Lea & Worsley, 2005; Đokić et al., 2014; Eisinger-Watzl et al., 2015; Vittersø & Tangeland, 2015; Petrescu et al., 2016; Kranjac et al., 2017; Azzurra et al., 2019;

Stojić & Dimitrijević, 2020). However, a study conducted in Serbia showed that men have more positive attitudes about organic food and that they buy and consume it more often than women (Perić et al., 2017). Certain authors (Marreiros et al., 2010) disagree with previous research based on their results in a study of organic food consumers in Germany and Portugal, which has shown that gender does not have much influence in the process of making decision of buying organic food.

Some authors have found a connection between years of life and increased tendencies to buy an organic food (Mintel, 2000; Durham & Andrade, 2005; Rimal et al., 2005; Geen & Firth, 2006; Roitner-Schobesberger et al., 2008; Eisinger-Watzl et al., 2015; Singh & Verma, 2017). However, a large number of authors (Fotopoulos & Krystallis, 2002; Hughner et al., 2007; Hassan et al., 2009; Torjusen et al., 2010; Aertsens et al., 2011) argue that age has no effect on consumers in a decision to buy an organic food or has a minimal influence on it purchase (Lea & Worsley, 2005).

Consumers who buy organic food generally have higher social status according to a study conducted in Germany on 500 consumers (Eisinger-Watzl et al., 2015). Also, typical buyers with high revenues are more likely to buy organic products according to research results (Singh & Verma, 2017; Rizzo et al., 2020), but others find that income is uncorrelated with the probability of purchaising an organic food (Durham, 2007).

Some other research shown a positive correlation among the educationoal level and decision to purchase an organic food (O'Donovan & McCarthy, 2002; Sandalidou et al., 2002; Denver et al., 2007; Yue et al., 2008; Baudry et al., 2016; Singh & Verma, 2017). In accordance with the study that is conducted in France (Kesse-Guyot al., 2013), regular organic food buyers are more educated and more physically active than occasional organic food buyers. Unlike previous, the results of other research have shown that there is no statistically significant cennection between education levels and organic food purchases (Thompson & Kidwell, 1998; Lea & Worsley, 2005; Rimal et al., 2005).

Even 71.8% of the consumers prefer to buy Serbia from the organic products over the conventional (Dašić et al., 2019). The majority of respondents state that very rarely (46%) or never (8.5%) buy organic products. Another study of socio-demographic characteristics of organic food buyers and the frequency of organic food purchases was conducted in Serbia. About 300 respondents aged 20 to 65 were interviewed in larger cities in Serbia in 2013. The results of the research showed that consumers who buy an organic product at least once a week make up 28.3%, while people who stated that rarely or never buy an organic products make up 71.7%. Organic food buyers are mostly women, married, have higher education and income, have children and live often in larger households (Đokić et al., 2014). Another study confirms that consumers of organic products are mostly of higher education, but unlike the results of previous authors, they live in smaller households – up to 4 members (Kranjac et al., 2017).

Another research was conducted in Serbia in April 2020 through an online survey on a sample of 1022 respondents (Ćirić et al., 2020). The results showed that the most common buyers of organic food are aged 25 to 39 years and that they have a higher

level of education, that is in accordance to the study of which buyers of organic food are most often beetwen 21 to 40 years (Kranjac et al., 2017). According to the previous research, consumers under the age of 21 the least buy an organic food, which is also confirmed by results of another research according to which more than 60% of the youngest respondents do not pay much attention to the origin of organic food (Stojić & Dimitrijević, 2020). It is interesting, even when only higher education is considered, that people with undergraduate and master studies buy organic food more often than people with a PhD. Also, consumers who have higher revenues often tend to purchaise an organic products, which is in line with other research (Vehapi & Dolićanin, 2016; Končar et al., 2019).

Materials and methods

Some of the most important issues that are increasingly asked in scientific frameworks are:

1) What is the average frequency of buying organic food in general?

2) Who are the typical buyers of organic products? (their gender, education, age, area, material status)

The purpose of actual study is to give an answers to these questions in order to understand better the basic demographic characteristics of a typical organic food buyer as well as the presence of a tendency for a healthy lifestyle reflected in the purchase of organic food among people from Serbia.

The main goal and significance of this research is reflected in the determination of relevant information on the frequency of purchases and typical characteristics of organic customers. Besides the obvious theoretical significance which is reflected in a better understanding of the examined phenomena, the obtained information can also be used for practical purposes by various stakeholders. These can primarily be: traders, producers, distributors, importers, policy makers, various interest groups and others, in order to adequately and properly design strategies in accordance with the interests and perceptions of organic food buyers. Based on a better insight into who the typical buyers of organic food are and what their main preferences are, producers can organize the production of adequate products, which will meet the their expectations. Based on this information appropriate marketing strategies are available to the marketers and distributors, which can be usefull to them in order to increase the number of customers and sales value.

The basic hypotheses of curent research can be defined in the following way. There are statistically significant differences in scores when it comes to the frequency of organic food purchases in general (H1), but also depending on gender (H2), education (H3), age (H4), material status (H5), rural or urban area (H6) and marital status (H7).

The sample consisted of 571 respondents, of different gender, education, age, material and marital status, as well as area. In addition to the list of basic data on the respondent, a specially designed questionnaire was used for the needs of current research, which

was conducted online via Google Forms. It consists of 20 items of five-pointe Likert scale concerning different variants related to nutrition, frequency consumer purchases, motives, barriers and habits. The reliability of this questionnaire in research on this and similar topics (Čolović and Mitić, 2021; Čolović et al, 2021) measure of internal consistency ranged from 0.71 to 0.81 of Cronbach's alpha. In addition to descriptive statistics, the Man Witney U test was used to determine differences between two groups of subjects and the Kruskal–Wallis one-way analysis of variance test was used to examine differences in scores between larger number of groups subjects.

Results and discussion

Frequency of organic food purchases

Based on the obtained results on the frequency of purchasing organic food, it can be seen that in our culture there is still no developed awareness of the importance of a healthy nutrition and the benefits it brings. Thus, in the examined sample, only 5.4% of respondents stated that they buy organic food every day, 13.5% two to 3 times a week, while the largest part are made of those who stated that they never buy organic food, even 28.2%. There is a very high percentage of those who rarely buy organic food. Thus, 27.9% state that they buy once a month, while 25.0% do so once a week (Table 1).

Table 1. Frequency of organic food purchases

	Frequency	Percent
Never	161	28.2
Once a month	159	27.9
Once a week	143	25.0
2-3 times a week	77	13.5
Daily	31	5.4
Total	571	100

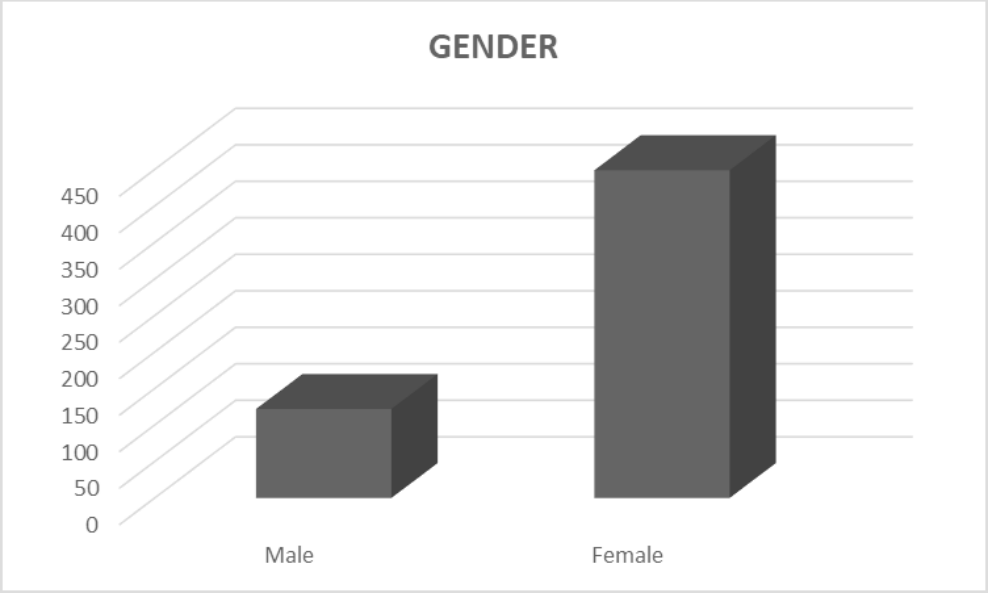
Source: Authors' calculations

One of the possible reasons for such results may be insufficient information of consumers about the importance and significance of quality nutrition, as well as all the benefits it brings. Also, some of the potential reasons that are common in our population can be: unavailability of organic products, distrust in certification, taste, various psychological factors, etc. The biggest obstacle for consumers in buying organic food is certainly the high price, which is not surprising given the lower standard of our population compared to more developed countries (Čolovic & Mitic, 2021). The results of mentioned research are in line with the results according to which 2.3% of respondents often buy organic products, while over 50% do not buy or rarely buy organic products (Dašić et al., 2019) and research according to which as many as 71.7 % of consumers rarely or never buy organic food (Đokić et al., 2014).

Demographic characteristics of organic food consumers

Current research involved 571 respondents of which 449 female and 122 male (Figure 1).

Figure 1. Gender of the respondents in the sample



Source: Authors' calculations

Statistically significant gender differences in scores were obtained in favor of women, who proved to be more frequent buyers of organic food (Mann-Whitney U=24861.000; $p<0.05$) (Table 2).

Table 2. Result of Mann-Whitney U test – statistical significance of gender differences

	FREQUENCY OF PURCHASING ORGANIC FOOD
Mann-Whitney U	24861.000
Sig.	.000

Group variable: gender

Source: Authors' calculations

A possible reason for this results may be greater attention and commitment to physical appearance by women than men. Also, the reason for the obtained results may be the fact that women go shopping more often and pay more attention in planning purchases and checking the quality of food they intend to buy, in order to maintaine better self as well as the health of their their families (Table 3).

Table 3. Gender differences in the purchase of organic food

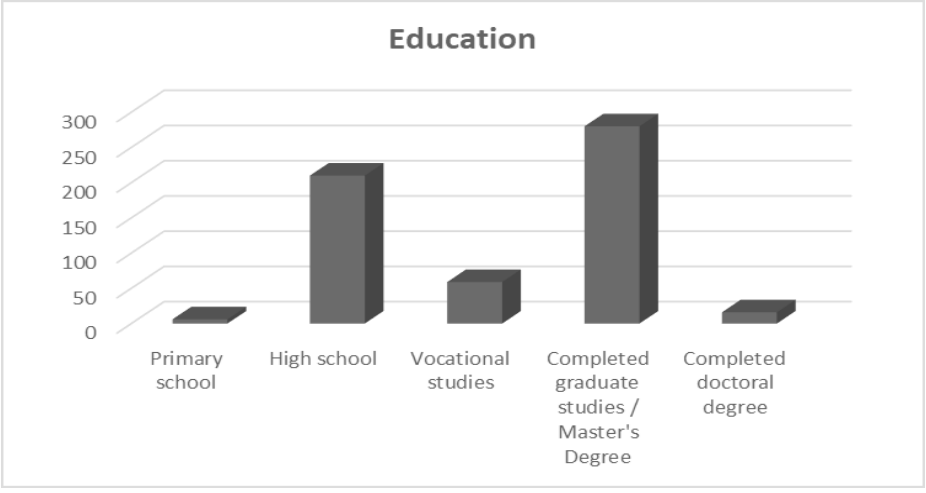
	GENDER	N	MR	∑R
Frequency of Purchasing organic food	Male	122	265.28	32364.00
	Female	449	324.89	145876.00
	Total	571		

Source: Authors' calculations

This result is consistent with research (Lockie et al., 2002; McEachern & McClean, 2002; O'Donovan & McCarthy, 2002; Storstad & Bjørkhaug, 2003; Diamantopoulos et al., 2003; Lea & Worsley, 2005; Onyango et al., 2007; Đokić et al., 2014; Eisinger-Watzl et al., 2015; Vittersø & Tangeland, 2015; Petrescu et al., 2016; Kranjac et al., 2017; Azzurra et al., 2019 ; Stojić & Dimitrijević, 2020), and is not in line with research according to which gender has no effect on the frequency of organic food purchases (Marreiros et al., 2010), nor research, according to which men buy more often then women organic food (Perić et al., 2017).

In the current research, there are 6 persons (1.1%) witch completed only primary school, 210 (36.8%) with secondary education, 59 persons or 10.3% have completed vocational studies or higher education, while 280 persons (49%) have higher education and 16 persons have a PhD diploma, which present 2.8% of the total sample (Figure 2).

Figure 2. Education of the respondents in the sample



Source: Authors' calculations

As far as education is concerned, the frequency of organic food purchases has shown to increase with the level of education, which can be related to the increasing awareness of the importance of a healthy nutrition and plenty advantages of organic food in relation to conventional and GMO. A higher level of education is mostly associated with higher income (which proved to be true in the current research), ie a higher possibility of buying organic food.

More precisely, people with a PhD are the most frequent buyers of organic food, while people who have only completed primary school are the least likely to buy this type of food (Table 4).

Table 4. Educational differences in the purchase of organic food

	EDUCATION	N	MR
Frequency of purchasing organic food	Primary school	6	232.89
	High school	210	260.31
	Vocational studies	59	286.79
	Completed graduate studies / Master's Degree	280	301.87
	Completed doctoral degree	16	333.34
	Total	571	

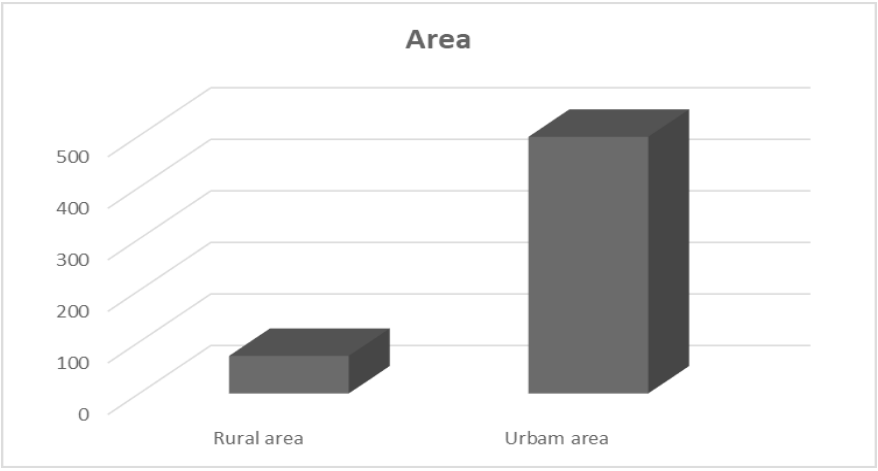
Source: Authors' calculations

The magnitude of the obtained differences, measured by the Kruskal-Walis test, was at a statistically significant level ($\chi^2 = 10.32$; $p < 0.05$).

This results are consistent with result obtained in some research (O'Donovan & McCarthy, 2002; Sandalidou et al., 2002; Denver et al., 2007; Yue et al., 2008; Kesse-Guyot al., 2013; Baudry et al. al., 2016; Singh & Verma, 2017) while are not in line with another results (Thompson & Kidwell, 1998; Lea & Worsley, 2005; Rimal et al., 2005) according to which the level of education does not affect the frequency of organic food purchases.

Most of the people in the sample live in the city, as many as 498 of them, which is 86.7%. Only 73 respondents are from rural areas, or 13.3% (Figure 4).

Figure 3. Area of living of the respondents in the sample



Source: Authors' calculations

People who live in the urban areas – big cities, tend to often buy an organic food (Table 4).

Table 4. Differences in the purchase of organic food regards to area

	AREA	N	MR	∑R
Frequency of purchasing organic food	Rural area	73	251.70	20564.00
	Urbam area	498	296.63	162742.00
	Total	571		

Source: Authors' calculations

One of the possible reasons is the fact that people who have been living in the cities have a much more enable information and greater availability of organic food stores. The size of the received differences is at a statistically significant level (Mann-Whitney U=17863.000; $p<0.05$) (Table 5).

Table 5. Result of Mann-Whitney U test – statistical significance of purchasing organic food regards to area

	FREQUENCY OF PURCHASING ORGANIC FOOD
Mann-Whitney U	17863.000
Sig.	.000

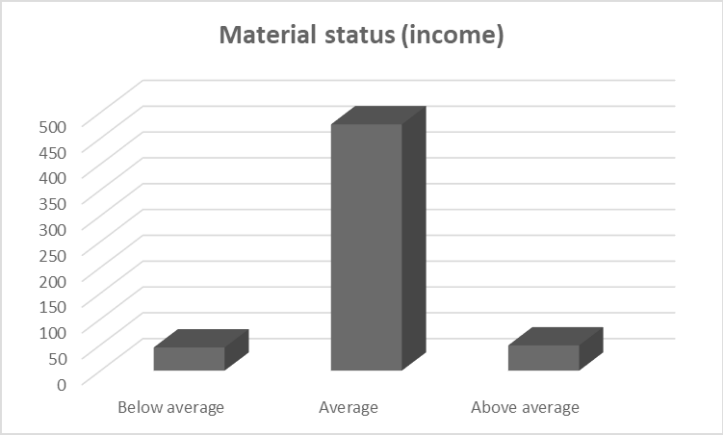
Group variable: area

Source: Authors' calculations

The results of the current research are in line with research according to which customers in cities are more likely to buy organic food than customers in rural areas (McEachern & Willock, 2004) as well as with another according to which customers from the city center tend to buy an organic food more often than those who live in the suburbs (Hamzaoui-Essoussi & Zahaf, 2012).

Over 83% of respondents in our sample stated that they have an average income (477 to be precise). 49 persons rated their income as above average, which represent 8.6%, while 45 persons stated that they had income below average (7.9%) (Figure 4).

Figure 4. Material status (income) of the respondents in the sample



Source: Authors' calculations

It has been shown that with better material status, that is with the increase of income, the frequency of buying organic food generally increases. People who reported to have an above-average income tended to buy organic food the most (Table 6).

Table 6. Result of Kruskal–Wallis test
(significance of differences regards the material status – income)

	MATERIAL STATUS (INCOME)	N	MR
Frequency of purchasing organic food	Below average	45	270.07
	Average	477	298.77
	Above average	49	332.04
	Total	571	

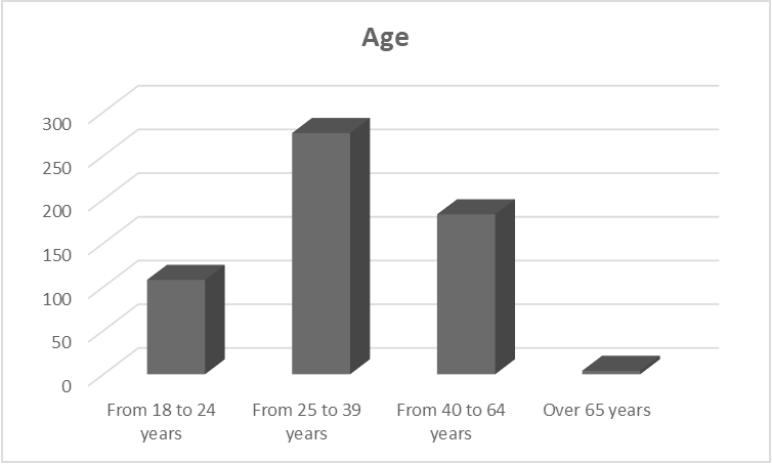
Source: Authors' calculations

This can be related to the higher price of organic products, respectively the inability of people with lower material status to afford an organic food and products. The obtained differences in the scores of the respondents are at a statistically significant level (χ^2=5.311, p<0.05).

The results of the current research are in line with the results of other research (Eisinger-Watzl et al., 2015; Singh & Verma, 2017; Rizzo et al., 2020).

In the current sample, the largest number of respondents is aged 25 to 39 years (48.5%). People between the ages of 40 and 65 are in second place (32%), followed by younger respondents (18.9%), while older respondents make up 0.6% of the sample (Figure 5).

Figure 5. Age of the respondents in the sample



Source: Authors' calculations

The obtained differences in the scores of respondents of different ages are at a statistically significant level (χ^2=5.311; p<0.05).

With age, the frequency of buying healthy food increases. Thus, the oldest respondents most often buy this type of food. The turning point in making this decision is probably related to the appearance of certain diseases and the decline of vital functions, which consequently lead to increased care for one's own health and awareness of the importance of a healthy nutrition. Considering the majority of older respondents have a regular income, it becomes clear that this further facilitates and contributes to the purchase of organic food in this age group.

The following table shows the magnitude of the obtained differences.

Table 7. Differences in the purchase of organic food regards to age of respondents

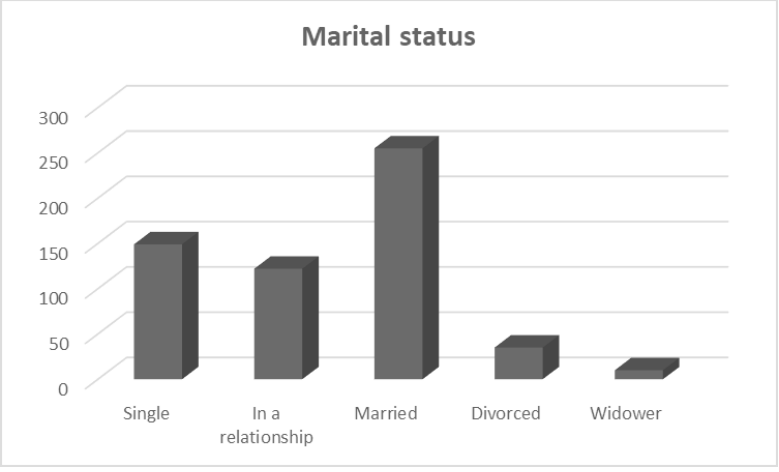
	AGE	N	MR
Frequency of purchasing organic food	From 18 to 24 years	108	275.32
	From 25 to 39 years	276	283.08
	From 40 to 64 years	183	296.15
	Over 65 years	4	311.88
	Total	571	

Source: Authors' calculations

The obtained results are in accordance with the group of research (Mintel, 2000; Durham & Andrade, 2005; Rimal et al., 2005; Geen & Firth, 2006; Roitner-Schobesberger et al., 2008; Eisinger-Watzl et al., 2015; Singh & Verma, 2017), but are inconsistent with the results of other studies (Fotopoulos & Krystallis, 2002; Hughner et al., 2007; Hassan et al., 2009; Torjusen et al., 2010; Aertsens et al., 2011).

In a sample of 571 respondents, by far the largest number of respondents are married (44.7%). They are followed by persons without a partner (26.1%), then persons who are in a relationship (21.4%). Only 6.1% of respondents are divorced, while widows make up only 1.8% of the total number of respondents (Figure 6).

Figure 6. Marital status of the respondents in the sample



Source: Authors' calculations

No statistically significant differences were obtained in the scores of respondents of different marital status (χ^2=6.01; p>0.05).

This result is not in accordance with the results of previous research according to which married people are most often buyers of organic food (Hamzaoui-Essoussi & Zahaf, 2012; Dimitri & Dettmann, 2012; Kranjac et al., 2017).

Table 8. Differences in the purchase of organic food regards to marital status

	MARITAL STATUS	N	MR
Frequency of purchasing organic food	Single	149	275.33
	In a relationship	122	303.20
	Married	255	285.70
	Divorced	35	252.83
	Widower	10	358.90
	Total	571	

Source: Authors' calculations

Conclusion

A conclusion can be drawn from all the above that the awareness of the importance and purchase of organic food in our environment is still at a very low level, due to which the frequency of purchasing this type of food is also very low.

Yet it can be concluded that the certain level of awareness the importance and significance of a healthy nutrition in order to improve and preserve the health and quality of one's own life and life of their family memebrs existence and it is most evident in certain groups of our respondents. So it turned out that the typical buyers of organic food are mostly female, with higher education and income, from the urban environment, and older age.

The results are not surprising if we keep in mind that females generally spend more time in shopping, and that high income make it easier to include organic food in the daily nutrition, given the fact that it is more expensive than conventional. Also, more educated customers who live in cities have more information and are better informed about the benefits of organic food, so they more often decide to buy organic food. Over the years, consumers take more and more care of their health, and therefore more often decide to buy and consume organic food in order to contribute better to their own health.

The significance of this research is reflected in providing, based on the obtained results, better insight into who are the buyers of organic food and what are their main socio-demographic characteristics. This is very important considering the fact that socio-demographic characteristics have a great influence on consumers in making a decision to purchaise an organic food.

The limitation of current research represent an uneven sample, primarily by gender and area, and it would be useful to equalize the number of respondents according to the mentioned variables in future research. Also, it would be interesting to extend researches

to other socio-demographic characteristics in order to see the influence they have on making the decision to buy an organic food, or even to conduct research in the others market in order to identify any difference in the most important socio-demographic characteristics of consumers, as well as, examine whether the frequency of purchaising an organic food is at approximate level in the other countries. Another interesting fact that would be good to investigate is the possible change that occurse in the frequency of baying an organic food after the Covid-19 Pandemic and whether has there occured a reassignment of the main demographic characteristics among buyers of organic food.

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Conflict of interests

The authors declare no conflict of interest.

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MODERN AGRIBUSINESS WITHIN THE FRAMEWORK OF SOCIETY 5.0

Cariša Bešić[1], Mihalj Bakator[2], Dejan Đorđević[3], Dragan Ćoćkalo[4], Sanja Stanisavljev[5]

**Corresponding author E-mail: mihalj.bakator@uns.ac.rs*

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ABSTRACT

The domestic agribusiness sector has an important role in economic development and in economic growth. The goal of the paper is to analyze potential influencing factors on sustainable agribusiness. The research methodology included qualitative correlation and causation analysis, categorization and deduction. Datasets from credible sources were analyzed a Sustainable Agribusiness Trend Index (SATI) model was developed. Through analyzing the existing body of literature, analyzing previous and newest available data in the domain of agriculture and macro-economic indicators, as well through the developed SATI model, potential future trends in the domain of sustainable agribusiness are noted. Based on the results of the study it can be concluded that modern agribusiness requires a multi-aspect approach. Factors such as renewable water sources, human development index, GPD growth and many other present integral parts of sustainable agribusiness development.

1 Cariša Bešić, Ph.D., Full Professor, University of Kragujevac, Faculty of technical science Čačak, 32000 Čačak, Svetog Save 65, Republic of Serbia. Phone: +381 60 369 96 96, E-mail: carisa.besic@sbb.rs, ORCID ID (https://orcid.org/0000-0001-5370-5328)

2 Mihalj Bakator, Ph.D., Teaching Assistant, University of Novi Sad, Technical faculty "Mihajlo Pupin" in Zrenjanin, 23000 Zrenjanin, Đure Đakovića bb, Republic of Serbia. Phone: +381 61/180-61-69, E-mail: mihalj.bakator@uns.ac.rs, ORCID ID (http://orcid.org/000-0001-8540-2460)

3 Dejan Đorđević, Ph.D., Full Professor, University of Novi Sad, Technical faculty "Mihajlo Pupin" in Zrenjanin, 23000 Zrenjanin, Đure Đakovića bb, Republic of Serbia. Phone: +381 62 801 97 26, E-mail: dejan.djordjevic@tfzr.rs, ORCID ID (https://orcid.org/0000-0001-9453-9207)

4 Dragan Ćoćkalo, Ph.D., Full Professor, University of Novi Sad, Technical faculty "Mihajlo Pupin" in Zrenjanin, 23000 Zrenjanin, Đure Đakovića bb, Republic of Serbia. Phone: +381 62 801 97 41, E-mail: dragan.cockalo@tfzr.rs, ORCID ID (http://orcid.org/0000-0003-2085-5420)

5 Sanja Stanisavljev, Ph.D., Assistant Professor, University of Novi Sad, Technical faculty "Mihajlo Pupin" in Zrenjanin, 23000 Zrenjanin, Đure Đakovića bb, Republic of Serbia, E-mail: sanja.stanisavljev@tfzr.rs

Introduction

Serbia has a significant amount of agricultural resources. However, the full potential of these resources is not achieved. This has to be addressed as agribusiness plays an important role in economic development and economic growth (Sedlak et al., 2016). If the globalization of markets and the intensified competitive relations between enterprises across industries are taken into consideration (Bakator, Đorđević, & Ćoćkalo, 2019), then it becomes evident that in order to increase national competitiveness, the development of modern agribusiness in rural areas and the development of rural tourism in neglected rural areas is an imperative (Cvijanović, 2020). Rural areas are going through crisis and traditional lifestyles are disappearing. Therefore, tourism in these areas presents a driving factor of development of these areas. Rural tourism relies on history, heritage, and tradition. However, natural characteristics are often more important for sustainable development of these areas (Leković et al. 2020). With the goal to increase competitiveness on a regional and national level, the idea and concept of tourism clusters should be considered. These clusters can contribute to the increase of quality of service, innovation implementation, increase in the number of potential tourists, increase in profits, better cooperation with other enterprises, and development of local communities (Đoković et al., 2017; Pejanović et al., 2016). Overall, modern agribusiness integrates the application of modern management tools and techniques, advanced technologies, sustainable solutions, and support from the government in the form of incentives and strategic support.

Achieving national competitiveness has to be accompanied with sustainability and long-term positive improvements are an imperative. This notion is in accordance with the concept of Society 5.0, which not only addresses the economic aspects of prosperity, but also the prosperity of society in a sustainable way (Narvaez Rojas, 2021). It derives from the fourth industrial revolution - Industry 4.0 (Potočan, Mulej, & Nedelko, 2021). The concept of Society 5.0 moves further forward and presents an important perspective for the upcoming fifth industrial revolution - Industry 5.0 (Skobelev, & Borovik, 2017). Modern agribusiness has to encapsulate the application of advanced technologies that characterize Industry 4.0, and simultaneously it is necessary to address sustainability and the socio-economic aspects of agriculture within the frameworks of Society 5.0.

The main goal of this paper is to analyze the factors that affect sustainable agribusiness within the framework of Society 5.0 that takes into consideration not only economic goals (profit), but also the social aspects (society's prosperity and wellbeing). Based on the available data a Sustainable Agribusiness Trend Index (SATI) is modelled and discussed. This index takes into consideration a large set of indicators ranging from macro-economic indicators, to specific agricultural indicators. This way, a significant overview on the modern agribusiness potential in Serbia is obtained, and this contributes to the existing body of literature.

The paper consists of four main sections (excluding the Introduction and Conclusion sections). The first section provides details on the research approach. Next, a

theoretical background regarding the Society 5.0, sustainable development, and modern agribusiness is provided. The third section addresses and graphically presents the Sustainable Agribusiness Trend Index (SATI). In addition, potential future trends are discussed. Finally, in the fourth section, suggestions and guidelines regarding the competitiveness and improvements of the domestic agro-sector are discussed.

Materials and methods

Research framework: The research framework relies on four main phases. The first phase was obtaining literature sources and data sources. National and international databases were accessed via the public domain, and institutional credentials were used where required. The KoBSON service (Consortium of digital libraries of Serbia that includes domestic and international scientific journals and conferences) was used to access literature sources, which was used for providing a theoretical background of the paper.

The second phase included the development of a theoretical background and data overview of the collected datasets. The theoretical background includes studies in the domain of agribusiness, rural area development, Society 5.0, sustainable development, and modern agribusiness strategies. This way an adequate overview on the analysed trends in modern agribusiness is provided.

Third phase included data analysis such as deduction based on the available datasets, categorization of data, qualitative analysis where information from other studies and existing data were cross-analysed, qualitative correlation and causation. Within the third phase a simple linear model is developed in order to try and predict future trends in sustainable agribusiness.

The fourth phase includes suggestions and guidelines regarding modern agribusiness in Serbia. The suggestions are based on the evaluated literature background and on the developed model. In additions, several suggestions and guidelines are derived from assumptions that are based on the existing body of literature and are not directly in causational relation with the analysed datasets.

Data sources: Data from the Food and Agriculture Organization of the United Nations - FAO (FAO, 2021), and data from the Statistical Office of the Republic of Serbia - SORS (RZSS, 2021) was analysed. The datasets from these sources provided sufficient detail regarding sustainable modern agribusiness in Serbia.

The data sources included archives from previous years thus enabling comparisons in different domains of economic and agricultural development. Based on the available data and the aim of the paper, datasets were extracted and exported via spreadsheets. This has enabled further analysis and significant information could be derived regarding sustainable agribusiness in Serbia.

***Method of data analysis*:** The exported datasets were used to model a linear equation that presents a unified index of indicators called Sustainable Agribusiness Trend Index

(SATI) is modelled based on the obtained datasets from the FAO and SORS. The index included indicators regarding:

- Agricultural waters
- Society development and standard of living
- Scientific research and development
- Employment and risk of poverty
- Macroeconomic indicators

In sum, 26 indicators were taken into consideration when the linear model was developed. The model didn't take into consideration the potential "weights" of specific indicators but only their direct positive or negative influence on sustainable agribusiness. The indicators included GDP, GDP per capita, net salaries, national debt, inflation rates, gross domestic of agriculture, risk of poverty, organizations and researchers that conduct R&D in the domain of agriculture, agricultural water withdrawal and efficiency of irrigation, human index development, renewable water resources overall and per capita. The details regarding the noted indicators are given in Table 7, in the *Results* section of the paper.

The SATI was modelled through grouping the 26 indicators, and then three to four lettered labels were introduced. The corresponding data for each indicator was viewed for 2017, 2018, 2019, and 2020 (newest available data). Indicators are labelled and a unified coefficient is derived from them. The unified coefficient are presented via diagram and future potential trends are analysed. The model is developed in order to attempt to predict future sustainable agribusiness trends.

Hypotheses: Based on the aim of this paper, and the research methodology, the following hypotheses are proposed:

- H_1: Higher macro-economic values of GDP, GDP per capita, net salaries, investments, and gross domestic value of agriculture positively affect sustainable agribusiness.
- H_2: Higher macro-economic values of national debt, inflation rates, and risk of poverty negatively affect sustainable agribusiness.
- H_3: Research and development in the domain of agricultural sciences positively affect sustainable agribusiness.
- H_4: Higher values in the domain of agricultural water irrigation efficiency, GVA of irrigated agriculture, and renewable water resources positively affect sustainable agribusiness.
- H_5: Higher values of the human development index, total population that has access to drinking water, and total renewable water resources per capita positively affect sustainable agribusiness.

Overall, the proposed hypotheses are addressed through the analysis of existing studies in the domain of sustainability, agribusiness, Society 5.0, and through the analysis of datasets obtained from the Food and Agriculture Organization of the United Nations - FAO (FAO, 2021), and data from the Statistical Office of the Republic of Serbia - SORS (RZSS, 2021). In addition, the SATI model is developed in order to provide a significant overview on the indicators that affect sustainable agribusiness.

Theoretical background on Society 5.0, sustainable development, and agribusiness

In 2016, the Japanese government has proposed the concept of Society 5.0 that focuses on the wellbeing of society, preserving and protecting the environment, human security, and the application of advanced cyber-physical systems. The implementation and application of these cyber-physical systems aims at integrating and improving the collaborative relations between economic, social, and political systems (Shiroishi, Uchiyama, & Suzuki, 2018). The tremendous volume of data that is shared, stored, and chaotically distributed across cyberspace, presents the basis of the Society 5.0 concept. In these data centres, cloud-based computing technologies, business applications, service solutions, supply chain management services, and other technological solutions are aimed at socio-economic problems in various industries (Onday, 2019). As previously noted, Society 5.0 aims at improving the wellbeing of humans, increasing the standard of living and improving rural and urban environments.

The concept of Society 5.0 integrates the sustainable development approach into its core mechanism. Thus, financial and technological development have to be long-term strategic solutions that are sustainable on all levels in order to organically improve social, economic, and environmental ecosystems, (Shiroishi, Uchiyama, & Suzuki, 2108). Sustainable development within the framework of Society 5.0 includes (Serpa, & Ferreira, 2018; Zhai et al., 2020):

- New advanced and agile manufacturing systems;
- Development of global innovation ecosystems;
- Development of resilient and adaptable infrastructures;
- Energy value chains and efficient value chains;
- Smart agriculture for increasing food production;
- Smart maintenance systems and infrastructure update systems;
- Observation centres for water and land management;
- Observation and monitoring centres for climate change and disease prevention;
- Developing smart food chains and supply chains in agriculture;
- Developing advance social security systems;

- Integration of smart logistics and distribution centres;
- Implementing advanced ICTs across industries and decision support systems;
- Standardization of formats and processes in relevant industries in order to increase compatibility.

Society 5.0 addresses every sustainable development goal (directly or indirectly) and integrates the relations between social, economic, and environmental dimensions with the main goal to develop sustainable mechanisms across industries (Pereira, Lima, & Charrua-Santos, 2020; Roblek et al., 2020). Further, the situation in Serbia regarding sustainable development includes various improvements, status quos, and negative results. Improvements are noted in healthcare services, gender equality, and access to electric power, fiscal policies, and partnerships with other countries (RZSS, 2020b). Status quos or little to no change is noted in economic growth, employment strategies, youth employment, sustainable industrialization, preservation of forests and mountains (RZSS, 2020b). Negative changes from the aspect of sustainability include the increase of poverty rates, inadequate percentage of how manufacturing resources are used, low productiveness of resources, inadequate percentage of recycling, and severe lack of optimal water management (RZSS, 2020b). Overall, Society 5.0 aims at sustainable development across all industries, and doesn't put economic aspects before social aspects. Furthermore, when Society 5.0 is taken into consideration, then the current agribusiness sector in Serbia is not developed enough, it doesn't live up to its potential, and there is a lot of room for improvement. The globalized international market in the agribusiness sector (and other sectors as well) is characterized by intensified competitive relations (Đorđević, Ćoćkalo, & Bogetić, 2016). The current agribusiness sector in Serbia lacks competitiveness due to low productivity, old farming and manufacturing equipment, and low standardization rates (Ćoćkalo et al., 2019).

Modern agribusiness solutions and strategies within the frameworks of Society 5.0 include organic agribusiness models, where sustainbale organic farming is practiced on larger scale with the aim to provide healthier agro-products for customers without over-exploiting natural resrouces (Shiri, 2021).

Further, the implementation of technological innovations in enterprises and organizations that conduct business in the agro-food sector is an imperative for increasing competitiveness and sustainability (Jokić, et al., 2018; Vujović & Vujović, 2021). These technologies have to addresses the sustainability aspect of adopted and applied agribusiness methods. Therefore, adequate research and development of new flexible and sustainable strategies is important.

Modern agribusiness also includes the development of eco-tourism in rural areas of Serbia. This requires economic policies that address entrepreneurial activities in this domain, but also in other sectors as well (Petrović, & Vuković, 2016; Simić et al., 2021). In previous studies it was noted that small and medium-sized enterprises (SMEs) are important for the development of Serbia's agribusiness sector and are necessary for

improving exports of agro-food products (Đurić et al., 2017; Sagić et al.,2019). Natural resources are not effectively exploited and there is not enough value distribution within the existing agribusiness sectors (Erić, Đuričin, & Pantić, 2015). Effective agribusiness models have to consider the existing challenges and barriers of the domestic agro-food sector. Based on the evaluated situation, effective solutions can be introduced such as the development of new and useful products and increased labor productivity through innovative solutions that rely on market trends, partnerships, cluster, value chains, agricultural research centers, educational institutions, and forming innovative infrastructures (Saiz-Rubio, & Rovira-Más, 2020; Sokolova, & Litvienko, 2020). Advanced modern agribusiness solutions can also include the application of modern information-communication technologies, robotics, data analysis, unmanned aerial technologies, 3D mapping, smart farming, real-time data analysis and field evaluation (Kovalev, & Testoyedov, 2020; Vapa-Tankosić et al., 2021). Other approaches includes innovative and new agrochemicals that contribute to sustainable food production, land efficiency, crop yield sustainability, quality of agro-food products, lower production costs, and contribute to sustainable income for farmers (Maienfisch, & Stevenson, 2015). Significant aspects of modern agribusiness practices are supply chains and value chains. Organized value chains connect raw material producers, intermediaries, manufacturing enterprises, wholesale, retail, services providers and other organizations and individuals that contribute to the value of distribution chains (Keshelashvili, 2018). Besides value chains, soil databases can be used for evaluating soil characteristics. Classification of soil types and large data analysis provides significant insight into the potential crop yields, and can support supply chains and distributive centers on a national and international level (Eremia, 2018). Besides the noted technological solutions, universities and research institutions have their role in modern agribusiness, too. Universities, research organizations, and consulting organizations have to provide scientific research and consultations for improving crop yield, productivity, and higher quality products (Eremin, & Skipin, 2018).

In sum, modern agribusiness requires multiple approaches that includes innovation, advanced technology implementation, modern management methods and techniques, and research and development.

Results

The modern agribusiness approaches noted in the previous section, the framework of Society 5.0, and necessity for sustainable development outline the potential of the domestic agribusiness environment. Sustainable agribusiness trends in this paper include macroeconomic indicators that are presented in Table 1.

Table 1. Macroeconomic indicators

Indicator	2015	2016	2017	2018	2019
GDP (billions of euros)	35.7	36.7	39.2	42.9	45.9
GDP (%)	1.8	3.3	2.0	4.4	4.2
GDP per capita (euros)	5034	5203	5581	6138	6610
Net salaries (growth in %)	-2.1	2.5	0.9	4.4	8.5
Investments (% of GDP)	16.8	16.9	17.7	20.1	22.4
National debt (% of GDP)	70.0	67.8	57.9	53.7	52.0
Inflation rates	1.5	1.6	3.0	2.0	1.9

Source: (RZSS, 2021)

It is evident that there is a steady increase of GDP, GDOP per capita, and reduction of inflation rates and national debt. According to CEKOS inflation rates for 2020 are 1.3% (CEKOS, 2021a) and 6.6% for 2021 (CEKOS, 2021b). Further, in Table 2., the gross domestic value percentages by sectors are presented.

Table 2. Gross domestic value - by sectors

Sector	2015	2016	2017	2018	2019
Agriculture	2.9	2.9	2.4	2.4	2.2
Mining	4.8	3.7	4.5	4.2	3.9
Manufacturing	28.5	28.8	28.9	28.2	27.6
Electricity production	8.2	11.1	9.7	8.5	7.7
Water supply	2.6	2.3	2.2	2.2	2.0
Construction	6.9	6.3	6.3	6.7	8.2
Wholesale and retail	17.6	17.4	18.1	17.0	17.9
Traffic and infrastructure	7.8	7.7	7.5	9.8	7.0
Accommodation and food	1.2	1.1	1.1	1.3	1.4
Information and communication	9.3	8.8	8.6	8.5	9.4
Finance	0.2	0.1	0.1	0.1	0.2
Real estate	1.1	1.0	1.1	1.0	1.2
Scientific work	4.9	4.4	4.6	5.0	5.3
Public organizations	0.0	0.0	0.0	0.0	0.0
Education	0.1	0.2	0.2	0.2	0.2
Healthcare and social work	0.0	0.0	0.0	0.1	0.1
Art and entertainment	0.7	0.8	0.9	1.0	1.0
Other services	0.2	0.2	0.2	0.2	0.2

Source: (RZSS, 2021)

Based on the data in Table 2., the agriculture sector is not achieving its full potential as its gross domestic value is only 2.2. By implementing modern agribusiness models and approaches, GDV for the agriculture sector could increase significantly. Next, sustainable modern agribusiness within the frameworks of Society 5.0 has to take into consideration the wellbeing of society regardless of employment status. Thus, the risk of poverty rates by employment status are presented in Table 3.

Table 3. Risk from poverty rates by employment status

Employment status	2017	2018	2019	2020
Employed (other)	10.8	10.0	9.2	7.8
Employed - private enterprise	6.8	6.8	6.5	6.2
Business owner	35.5	31.0	25.9	18.8
Unemployed	50.7	49.0	47.5	46.7
Retired	17.5	17.1	17.2	19.4
Other inactive	33.4	35.7	33.5	32.6

Source: (RZSS, 2021)

The data in Table 3., indicates that improvements regarding risk from poverty should be faster and not in status-quo. Modern agribusiness relies on technological advancement and innovation. Therefore, research and development in the domain of agriculture is a significant factor for long-term sustainability. The number of organizations that conduct R&D by scientific field and sector in 2019 and 2020 is presented in Table 4.

Table 4. Number of organizations that conduct R&D in 2019 and 2020

2019					
Scientific field	Total	Business sector	Public sector	Education sector	Non-profit sector
Total	337	165	57	112	3
Science	64	35	12	16	1
Engineering and technology	129	95	10	23	1
Medical sciences and health sciences	25	13	3	9	/
Agricultural sciences	33	15	11	7	1
Social science	64	7	10	46	/
Humanities	22	/	11	11	/
2020					
Scientific field	Total	Business sector	Public sector	Education sector	Non-profit sector
Total	335	159	59	113	4
Science	63	33	13	16	1
Engineering and technology	128	93	10	23	2
Medical sciences and health sciences	18	6	3	9	/
Agricultural sciences	32	14	12	6	/
Social science	72	13	10	48	1
Humanities	22	/	11	11	/

Source: (RZSS, 2020a)

Additionally, the number of researchers that work on R&D positions by scientific field in 2019 and 2020 is presented in Table 5.

Table 5. Number of researchers that work on R&D in 2019 and 2020

Scientific field	2019	2020
Total	16399	16662
Science	3968	2552
Engineering and technology	4335	2641
Medical sciences and health sciences	2768	1882
Agricultural sciences	1176	961
Social science	2671	2136
Humanities	1481	973

Source: (RZSS, 2020a)

Modern agribusiness within the frameworks of Society 5.0 focuses on the improvement of the economic aspects of agriculture, and at the same time takes into consideration sustainable development of agribusiness models, and the well-being of society. Therefore, indicators regarding agriculture, water resources, and human development are presented in Table 6.

Table 6. Agriculture, water resources, and human development indicators

Indicator	2003-2007	2008-2012	2013-2017	2018-2022
Agricultural water withdrawal as % of total renewable water sources	0.079	0.385	0.407	0.440
Irrigated Agriculture Water Use Efficiency (US$/m^3)	/	0.148	0.165	0.166
Agriculture, value added (% GDP)	6.119	6.435	6.014	6.343
% of agricultural GVA produced by irrigated agriculture (%)	/	3.376	4.337	4.258
Human Development Index (HDI) [highest = 1]	0.754	0.772	0.794	0.799
Total renewable water resources (10^9 m3/yr)	162.2	162.2	162.2	162.2
Agricultural water withdrawal (10^9 m3/year)	0.128	0.624	0.661	0.712
Total population with access to safe drinking-water (JMP) (%)	99.3	99.2	99.2	99.2
Total renewable water resources per capita (m3/inhab/yr)	17 822	18 143	18 370	18 426

Source: (FAO, 2021)

Based on the noted indicators in Table 1-6, a unified indicator called "Sustainable Agribusiness Trend Index (SATI)" is modelled. The indicators and labels and for calculating the SATI is presented in Table 7.

Table 7. Sustainable Agribusiness Trend Index (SATI) indicators

Indicator	Label	2017	2018	2019	2020
GDP (billions of euros)	GDP	39.2	42.9	45.9	44.2 est.
GDP per capita (euros)	GDPC	5581	6138	6610	6450 est.
Net salaries (growth in %)	NETS	0.9	4.4	8.5	2.5 est.
Investments (% of GDP)	INV	17.17	20.1	22.4	24.1 est.
National debt (% of GDP)	NATD	57.9	53.7	52.0	50.0 est.

Inflation rates	IFR	3.0	2.0	1.9	3.7 est.
Gross domestic value - Agriculture (%)	GDVAG	2.4	2.4	2.2	2.0 est.
Risk of poverty: • Employed (other) • Employed - private enterprise • Business owner • Unemployed • Retired • Other inactive	• RPEO • RPEP • RPBO • RPUN • RPRE • RPOI	• 10.8 • 6.8 • 35.5 • 50.7 • 17.5 • 33.4	• 10.0 • 6.8 • 31.0 • 49.0 • 17.1 • 35.7	• 9.2 • 6.5 • 25.9 • 47.5 • 17.2 • 33.5	• 7.8 • 6.2 • 18.8 • 46.7 • 19.4 • 32.6
Organizations that conduct R&D - Total	RDT	/	/	337	335
Organizations that conduct R&D - Agriculture	RDAG	/	/	33	32
Number of researchers that work in R&D - Total	RETO	/	/	16399	16662
Number of researchers that work in R&D - Agricultural sciences	REAG	/	/	1176	961
Agricultural water withdrawal as % of total renewable water sources	AGWRE	0.407	0.440	0.440	0.440
Irrigated Agriculture Water Use Efficiency (US$/m^3)	IAGW	0.165	0.166	0.166	0.166
Agriculture, value added (% GDP)	AVGDP	6.014	6.343	6.343	6.343
% of agricultural GVA produced by irrigated agriculture (%)	GVAAGIR	4.337	4.258	4.258	4.258
Human Development Index (HDI) [highest = 1]	HDI	0.794	0.799	0.799	0.799
Total renewable water resources (10^9 m3/yr)	TRW	162.2	162.2	162.2	162.2
Agricultural water withdrawal (10^9 m3/ year)	AGWW	0.661	0.712	0.712	0.712
Total population with access to safe drinking-water (JMP) (%)	DRINK	99.2	99.2	99.2	99.2
Total renewable water resources per capita (m3/ inhab/yr)	RENPC	18 370	18 426	18 426	18 426

Source: Authors

The Sustainable Agribusiness Trend Index (SATI) calculation is based on the following equation:

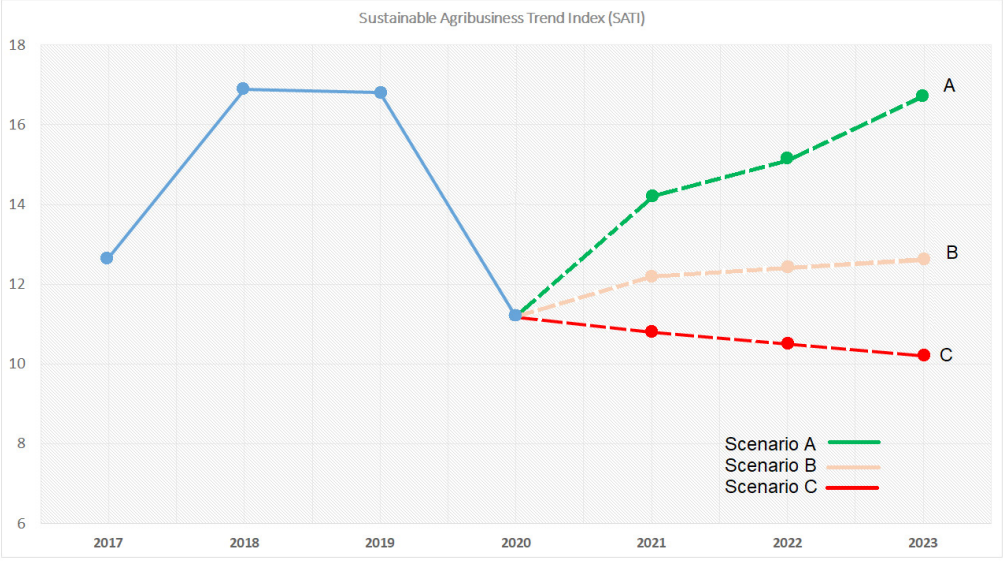
SATI =[**(GDP+GDPC+NETS/100+INV/100+GDVAG/100+RDAG/RDT+**
+REAG/RETO+AGWRE+IAGW+AVGPD+GVAAGIR+HDI+TRW+
+AGWW+DRINK+RENPC) / *(GDP*NATD/100+GDPC*IFR/100+*
+(RPEO+RPEP+RPBO+RPUN+RPRE+RPOI)/100)] /10

It is important to note that the SATI calculation is based on the assumption of linear effects of indicators that positively affect SATI **(bold part of the calculation)** and indicators that negatively affect SATI *(italic part of the calculation)*. This calculation is not directly addressing causation, nor does it take into consideration the different intensity (weight) of influence. Based on the data in Table 7. the SATI results are:

- $SATI_{2017}$=12.66
- $SATI_{2018}$=16.89
- $SATI_{2019}$=16.81
- $SATI_{2020}$=11.18

The SATI results and potential future trends are presented on Figure 1.

Figure 1. SATI values and potential future outcomes (scenarios)



Source: Authors

Figure 1. depicts the SATI from 2017 to 2020. In addition, three scenarios of potential future SATI are noted. Every scenario takes into consideration the potential of future sustainable development of the domestic agribusiness sector. The predicted potential scenarios are based on logical and analytical assumptions derived from the theoretical background and evaluated data.

Scenario A is the most favourable where the SATI is increasing over the coming years. This scenario is possible if renewable water sources are optimized, new technologies and innovations are applied in the agriculture sector, the government provides incentives and support via logistics and reducing bureaucracy, the standard of living is improved, GDP is increased, GDP per capita is increased, and risk of poverty is reduced. Overall, scenario A requires improvements across all the noted economic and social indicators.

Scenario B is the most probable outcome if the global economic crisis is taken into consideration. Scenario B includes little to no change in the noted economic and social indicators. It can also include worsening of some metrics, and improvements in others. However, sustainable development is not evident. There are no mechanisms that could lead to significant improvements.

The worst-case outcome, scenario C, is the result of overexploitation of natural resources, where GDP is decreasing, where water is not managed optimally, and there are no strategic solutions or plans in place for changing the unwanted outcomes of unsustainable agribusiness processes. This scenario, similarly to scenario A, has lower probability compared to scenario B.

Discussion

Domestic agribusiness in the domestic sector is not developed and it doesn't comply with the sustainable development goals. The analysed data and the calculated SATI values indicate that improvements are necessary when it comes to renewable water source exploitation, economic development, standard of living, and other indicators. Improvements in the domain of agribusiness rely on modern agribusiness solutions that are based on technological innovation, research and development, advanced agrochemical use, advanced logistics and value chains. Based on the theoretical background, the analysed datasets, and the SATI model, the proposed hypotheses are addressed as follows:

- H_1: Higher macro-economic values of GDP, GDP per capita, net salaries, investments, and gross domestic value of agriculture positively affect sustainable agribusiness. **is failed to be rejected.**
- H_2: Higher macro-economic values of national debt, inflation rates, and risk of poverty negatively affect sustainable agribusiness. **is failed to be rejected.**
- H_3: Research and development in the domain of agricultural sciences positively affect sustainable agribusiness. **is failed to be rejected.**

- H_4: Higher values in the domain of agricultural water irrigation efficiency, GVA of irrigated agriculture, and renewable water resources positively affect sustainable agribusiness. **is failed to be rejected.**
- H_5: Higher values of the human development index, total population that has access to drinking water, and total renewable water resources per capita positively affect sustainable agribusiness. **is failed to be rejected.**

Additionally, as the proposed hypotheses are failed to be rejected / proven, it can be noted that sustainable agribusiness requires a systematic approach from policymakers. More precisely, if sustainable agribusiness is viewed on a national level, then policymakers are the key actors, have to be the key contributors in creating an environment where sustainable agribusiness development can occur. Significant change can only happen if core policies are introduced regarding government incentives for agritourism, modern ICT implementation in agribusiness, and providing structural support when it comes to export of agriproducts.

Furthermore, based on the theoretical background of existing studies, data analysis, and the SATI model, the following suggestions and guidelines for improving the domestic agribusiness sector are noted:

- Assessing the current situation in the agro-food sector on a national level and determining the issues that are present and that hinder competitive ability;
- Water sources for irrigation have to mainly come from renewable resources;
- Rural tourism has to be further developed through government incentives and tourism clusters;
- Increasing awareness ICT importance in agribusiness and increasing the rates of ICT implementation in the agro-food sector;
- Increasing the number of processed products and reducing the export of raw or semi-finalized products;
- Developing nation-wide strategies for agricultural water supply and infrastructure;
- Developing clusters for different sub-sectors and small farms;
- Increasing the number of organic products and developing effective campaigns that promote these products on an international level;
- Focus should be on sustainability regardless of what type of crop is cultivated what type of finalized products are manufactured;
- Universities and R&D organizations should provide support (compensated, subscription-based, and/or free) for introducing modern agribusiness solutions;
- Advanced agrochemicals should be considered nation-wide and replacing harmful and unsustainable practices that involve pesticides, herbicides and other agrochemicals;

- Adequate infrastructure should be provided for small, medium and large farms, and reduce the monopoly effect of large farms and manufacturers;
- Environment preservation, economic growth, and the well-being of society should we synchronized and not exclusive from one another;
- Value chains should be clearly defined and determined, and financial instruments that would allow smaller investors to participate in the modern agribusiness sectors should be developed.

In sum, the domestic agribusiness sector requires structural and systematics changes for it to be sustainable and competitive. The implementation and application of modern technologies and agrochemicals are an imperative for increasing crop yields, quality, and productivity. Effective water and field management is required for sustainable development of the agro-food sector and to ensure that there is enough drinking water for the population. As noted earlier, policymakers have a key role in the conducting the necessary changes and actions listed above. Team of experts are an imperative to form effective and efficient workgroups. These workgroups can address the noted issues and challenges of the domestic agribusiness sector. Based on the evaluated data, systematic policies can be formed that will provide a solid basis from change and improvement.

Modern agribusiness in the context of Society 5.0, besides economic dimensions, has to take into consideration social and environmental dimensions as well in a sustainable manner. Generating value and profits should not be followed by overexploitation of water, fields, and other natural sources. Advanced technologies can improve some aspects of agricultural cultivation, however nation-wide, systemic approaches are necessary for sustainable agriculture development.

Conclusion

The domestic agribusiness sector involves a large number of indicators and factors. In this paper, modern agribusiness in the context of Society 5.0 is analysed. In addition, a Sustainable Agribusiness Trend Index (SATI) is modelled. The SATI provides an overview on how the domestic agribusiness sector can develop in the future. It can be concluded, that the current situation in the domestic agribusiness sector is not adequate and requires systematic changes and improvements in order to increase productivity, quality, and sustainability.

The main advantage of this paper that it manages to concisely present a complex issue that is modern agribusiness in the context of Society 5.0. The presented model and potential future trends contribute to the existing body of literature and provide a strong basis for future research. The main limitation of the paper is the lack of direct causational data between several indicators and potential outcomes. The current propositions are derived from an analytical approach and from deduction of the analysed. This can further indicate that the SATI model could be biased towards one or multiple indicators. In addition, datasets were obtained through existing external databases and there was

no surveying. However, these limitations don't affect integrity of this current study, but rather it implies guidelines for future research. SMEs could be investigated through structured surveys and meta-analyses could be conducted. Macro-economic indicators should be given less "weight" in certain situations, and additional factors could be introduced such as R&D-to-GVA ratio, modern agricultural solutions implementation rates, non-formal education of agribusiness owners, and import-export dynamics of agriproducts.

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Conflict of interests

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SUPPLY AND DEMAND OF FISH IN BOSNIA AND HERZEGOVINA

Nemanja Jalić[1], Aleksandar Ostojić[2], Nebojša Savić[3]

**Corresponding author E-mail: nemanja.jalic@agro.unibl.org*

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ABSTRACT

The primary goal of the paper was to analyze the fish market of Bosnia and Herzegovina (B&H). The paper presents the level of self-sufficiency and import dependence of fish for the period 2014-2020. The source of data was the data of the B&H Agency for Statistics and Indirect Taxation Authority of B&H. The following methods were applied: descriptive statistics, trend data and balance sheet method. On average, 3.161 tons of trout were produced in B&H per year, 82% of total fish production. Carp were produced 510 tons per year. Other freshwater fish are becoming less and less attractive for production. B&H's fish self-sufficiency is low (54%) and the average rate of import dependence is about 76%. The consumption of fish per capita is 2 kilograms. It is necessary to improve the education of the population throughout B&H about the importance of fish nutrition and the health aspects of its consumption.

Introduction

Fisheries and aquaculture are important sectors, whose main task is to provide food of animal origin for human consumption. The production of fish, crustaceans, molluscs and other aquatic animals in 2018. in the world amounted to 178.5 million tons, which is an increase of 3.4% compared to 2017. (FAO, 2020). The estimated production of freshwater aquaculture in the EU in 2018. had a value of about 910 million euros, with France, Poland and Italy being the main producers (by volume and value) with about

1 Nemanja Jalić, MA, Senior Assistant, University of Banja Luka, Faculty of Agriculture, Republic of Srpska, Bosnia and Herzegovina, Bulevar vojvode Petra Bojovića 1a, Phone: +38751330926, E-mail: nemanja.jalic@agro.unibl.org, ORCID ID (https://orcid.org/0000-0002-3094-5289)

2 Aleksandar Ostojić, Full professor, University of Banja Luka, Faculty of Agriculture, Republic of Srpska, Bosnia and Herzegovina, Bulevar vojvode Petra Bojovića 1a, Phone: +38751330926, E-mail: aleksandar.ostojic@agro.unibl.org, ORCID ID (https://orcid.org/0000-0001-6923-7602)

3 Nebojša Savić, Full professor, University of Banja Luka, Faculty of Agriculture, Republic of Srpska, Bosnia and Herzegovina, Bulevar vojvode Petra Bojovića 1a, Phone: +38751330977, E-mail: nebojsa.savic@agro.unibl.org, ORCID ID (https://orcid.org/0000-0002-3094-5289)

40% of total freshwater production. EU carp production in 2018. was around 70,000 tonnes, but rainbow trout is the leading freshwater produced species in Europe, with an estimated trout market in the EU in 2018. around 237,200 tonnes (EUMOFA, 2021).

The importance of fish as an agricultural commodity, which has become an important global commodity, is reflected in the steady increase in demand for fish (Kura et al., 2004). Aquaculture is practiced in almost every European country with the largest producers being Spain, France, UK, Greece and Italy (Bostock et al., 2016) Kranai (2018) states that the importance of freshwater fish production is growing at the European level as well as in Hungary, given that in global meat production, the position of fish and fish products is becoming increasingly important because a quarter of the world's supply of animal protein is produced by fisheries and aquaculture.

For decades, trends in fish hunting and aquaculture production have been analyzed and observed to understand changes in fish supply that affect the demand for these resources from rich urban to poor rural areas, and aquaculture has grown steadily since the 1970s making it one of the fastest-growing sectors in the world in whole agriculture (Rosegrant et al., 2004). According to the same authors, the structure of global supply and demand for fish has changed significantly in the last few decades. The gap in global fish demand and supply can be used to measure the growth potential of aquaculture globally because aquaculture is expected to be the main, if not the only source of growth in fish supply. However, in addition to domestic aquaculture, the supply of fish in one country may also be from imports (Cai & Leung, 2017).

The freshwater sector is by far the oldest in European fish farming, it is divided into 2 main components, those of rainbow trout and common carp. This distinction principally reflects climatic conditions where rainbow trout is more suitable for temperate environments with carp being better in the more extreme continental conditions seen in Central Europe (Bostock et al., 2016). Based on intra-EU-28 trade, Denmark is considered a major exporter, followed by Romania and Hungary. Based on market circumstances and consumer habits in the EU, it can be concluded that the market share of trout products is constantly increasing (Karnai, 2018).

The conditions of the aquaculture industry should be more favorable by switching to a healthy lifestyle, with the trend of increasing fish consumption per capita, and with the stabilization or decline of wild fish catches (Oikonomou & Polymeros, 2015). Maciel et al. (2019) state that regular consumption of fish can be associated with a healthier lifestyle that leads to a better perception of quality of life. De Bruyn et al. (2021) state that it is essential to ensure that increases in national fish supply translate to nutritional benefits for the most vulnerable.

EU trade in fishery and aquaculture products (imports and exports) in 2019. amounted to 33.37 billion euros and 8.55 million tons, making the EU the second largest trader in the world, after China. Imports, which accounted for around 80% of the total, amounted to EUR 27.21 billion and 6.34 million tonnes. Most countries, and the EU as a whole, remain highly dependent on resources from outside EU waters. Since 2000, the EU28

member states have reduced their degree of self-sufficiency by 7% – a significant decline (Carpenter and Owen, 2018).

B&H foreign trade in fishery products for the period 2010-2014. indicates that the value of imports exceeds the value of exports, which B&H, within chapter 3 of the harmonized system of customs tariffs, records a deficit in foreign trade (Pavličević et al., 2015). B&H in the period 2014-2017. had a surplus (quantitatively and in value) in the foreign trade of trout (domestic production exceeds domestic needs) which makes the self-sufficiency of this product positive (Ostojić et al., 2019).

In 2018. the world consumption of fish per capita was 20.5 kg (FAO, 2020), while in the EU in 2019. it was 23.82 kg (EUMOFA, 2020).

The EU trout self-sufficiency in 2018. was about 90% and the average consumption of trout was 0.42 kg per capita (live weight equivalent). The highest consumption of carp per capita is in Hungary with 1.41 kg, followed by the Czech Republic with 1.15 kg, Lithuania with 0.9 kg, Poland and Romania with 0.56 kg per capita (EUMOFA, 2021).

The amount and frequency of fish consumption can be increased by certain policies, such as training, advertising, and various marketing strategies (Can et al., 2015). Kaygisiz and Eken (2018) state that insufficient activity of marketing services leads to non-transparency of the fish market. Ostojić et al. (2017) state that during the analysis of the fish market in the city of Banja Luka (B&H) 41% of respondents stated that they are not sufficiently informed about fish as food and 59% of respondents state that they are informed about fish as food through various media, promotion and oral recommendations.

This paper aims to describe the situation in the B&H fish market for the period 2014-2020. in terms of quantity through the analysis of supply and demand.

Material and method

Through the analysis of supply and demand, it was aimed to estimate the level of self-sufficiency on the domestic market as well as the import dependency. The research was conducted based on available official secondary data, the so-called "desk research method". Certain data were taken from the website of the Agency for Statistics of Bosnia and Herzegovina and referred to:

- fish production in B&H for the period 2014-2020.
- estimated population in B&H for the period 2014-2020.

Foreign trade of Bosnia and Herzegovina, in quantitative terms, is observed according to the harmonized system of product classification (HS) within chapter 3 (fish and crustaceans ...) for customs tariffs 0301 to 0305 (trade in live, fresh or chilled, frozen fish, fish fillets as well as dried, salted, smoked fish, etc.). Data of international fish exchange were obtained on request from the Ministry of Agriculture, Forestry and Water Management of the Republic of Srpska and based on data from the Indirect Taxation

Authority of B&H. Basic indicators of descriptive statistics were used to assess the dynamics and stability of production, exports and imports. Based on the collected data, the import dependency ratio, self-sufficiency ratio and the indicative consumption of fish per capita were calculated. The calculation of these indicators is based on the FAO methodology (2012).

The starting equation in the above methodology is the following:

$$Production + Import = Consumption + Export$$

The assessment of the Import Dependency Ratio (IDR) was calculated according to the formula (neglecting the impact of stocks), (FAO, 2012):

$$IDR = \frac{Import}{Production + Import - Export} \times 100$$

Self-sufficiency is the capacity of the state to satisfy the demand from its production, and it is calculated as the ratio of domestic production to domestic consumption (EUMOFA, 2020). The Self Sufficiency Ratio (SSR) was calculated according to the formula (FAO, 2012):

$$SSR = \frac{Production}{Production + Import - Export} \times 100$$

The indicative consumption of fish per capita is calculated using the following formula:

$$Per\ capita\ consumption = \frac{Production + Import - Export}{Estimated\ population}$$

The success and accuracy of the calculation largely depend on the reliability of the data as the basic inputs in the model.

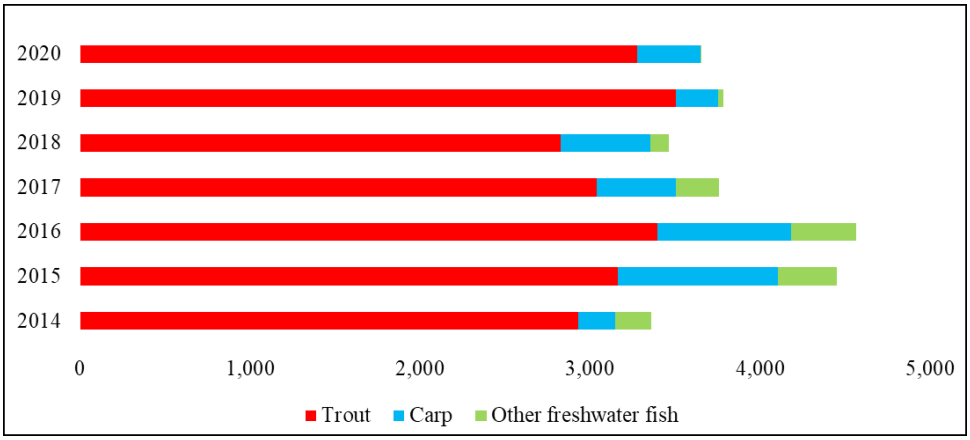
Results and discussion

Fish production in Bosnia and Herzegovina

Freshwater fish species production in Bosnia and Herzegovina has a long tradition, while farmed marine fish species have a negligible share in total fish production, and catches of fish from the sea have not been registered. The production of trout, carp and other freshwater fish species at the level of B&H is shown in *Figure 1*. It is noticeable that in the structure of fish production, trout dominates. Average annual production of freshwater fish species in B&H (trout, carp and other freshwater fish) for the period 2014-2020. was 3,862 t, of which the share of trout was 3,161 t (82%), carp 510 t (13%) and other freshwater fish species 190 tons (5%) of the total production of freshwater fish species. Trout production in Bosnia and Herzegovina increased at an average annual rate of 1.9%. Carp had an even more pronounced growth for the analyzed period,

growth of 9.3%, but with modest produced quantities. In general, fish production at the level of B&H had a significant growth rate of 1.42% in the observed period and varied 12.09%, which shows that the production depends on yearly conditions of production. Aquaculture has been growing steadily since the 1970s, making it one of the fastest-growing sectors in agriculture (Rosegrant et al, 2004).

Figure 1. Fish production (t) in Bosnia and Herzegovina



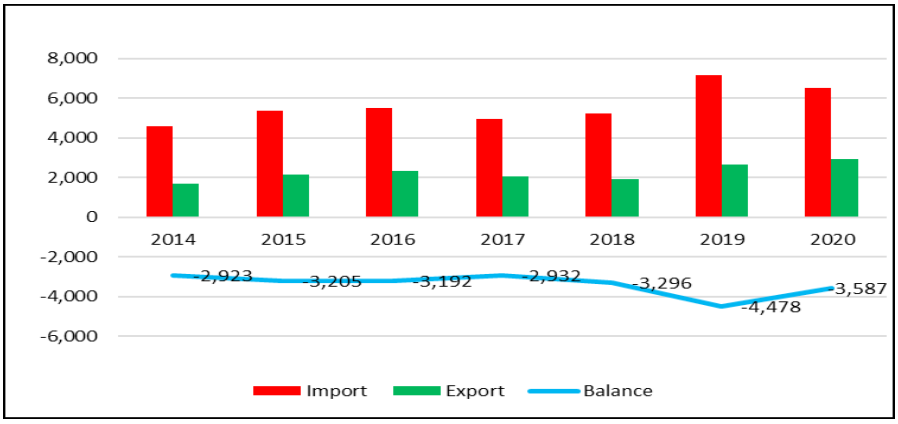
Source: Agency for Statistics of Bosnia and Herzegovina, authors calculation

Karnai (2018) and the data of EUMOFA (2021) showed that trout is the species that is mostly grown in Europe, which is also the case for B&H as well. When it comes to carp production, it is modest in B&H. EUMOFA (2021) states that of the total world production in the EU is produced only 2% of carp (about 4.2 million tons in 2018), and most of that production (71%) is concentrated in Central and Eastern Europe (the Czech Republic, Poland and Hungary).

Bosnia and Herzegovina's fish trade exchange

The foreign trade of fish of Bosnia and Herzegovina was analyzed only quantitatively. In the analyzed period, B&H imported on average 5,479 t of freshwater and marine fish, while export was much lower and averaged 2,141 t. *Figure 2* shows the foreign trade deficit, which averages about 3,400 tons per year for the analyzed period. The largest deficit is presented in 2019. and the smallest was in 2014. i.e. the foreign trade balance is increasingly unfavorable because the deficit grows every year at an average rate of 3.5%. The presented results confirm the previous research of Pavličević et al. (2015) on the deficit in B&H foreign trade in fishery products. Fish imports to Bosnia and Herzegovina from 2014. to 2020. grew by 6.0% per year. Exports also grew on average at 9.8%. The stability of imports and exports is relatively stable because there were no pronounced oscillations in the exchanged quantities (Cv_i = 16.02% and Cv_e = 19.49%).

Figure 2. Fish trade exchange balance of Bosnia and Herzegovina



Source: Ministry of Agriculture, Forestry and Water Management of the Republic of Srpska, based on data from the Indirect Taxation Authority of B&H, author's calculation

It is interesting to note that B&H exports almost 59% of the produced quantities of fish on average (2014-2020.). One of the reasons is probably the higher price when exporting fish, and the other fact is that trout dominates in production and that the duty-free quota for trout exports to the EU market is up to 500 tons (Savić et al, 2018). Kura et al. (2004) state that the growth of demand for fish is pronounced, while Cai and Leung (2017) point out that globally is expected that aquaculture will be the main, if not the only source of growth in fish supply. In addition to domestic aquaculture, fish supply in one country can also be from imports.

Fish self-sufficiency of domestic market

Table 1 shows the elements of the relationship between the supply and demand of fish on the domestic market (B&H) for the observed period. The rate of dependence on imports was the most unfavorable in 2020. B&H had the lowest dependence on imports in 2015. The average dependency rate in the analyzed period was 77.66%. In the observed period, it is noticeable that with the increase in domestic production, self-sufficiency is also increased, according to Carpenter and Owen (2018), which also conclude that the EU level of self-sufficiency in 2016. was around 52%. On average, slightly more than half of the domestic needs (54%) can be satisfied from own production. B&H had the lowest self-sufficiency in 2019. and the highest in 2016.

According to the OECD-FAO (2019) Agricultural Outlook in Europe, consumption in the world is projected to increase by about 0.5 kg per capita by 2028. In comparison with these values, it can be concluded that the consumption of fish per capita in B&H is extremely low. According to the author's calculation, it is estimated that in B&H for the analyzed period on average 2.07 kg of fish per capita was consumed. EUMOFA (2020) data can also be used as a comparison of fish consumption, where it is stated

that per capita consumption in the EU decreased from 24.79 kg in 2017. to 24.36 kg in 2018. which means that EU citizens consumed on average 0.43 kg less fishery and aquaculture products.

Fish dependence is a powerful concept that illustrates how much excessive consumption exceeds domestic resources (Carpenter and Owen, 2018). Bosnia and Herzegovina produced 1.1 kg of fish per capita in the observed period. Babović et al. (2011) also reported low fish production in Serbia (1.7 kg/capita) while total consumption was 5.7 kg/capita. This indicates that the requirements of the fish market in our country and the region are significantly higher than the quantities of produced fish. Global increases in consumption of food fish will predominantly take place in developing countries where the population is growing and higher-income allow the purchase of high-value fisheries items for the first time by many people (Rosengrant et al., 2004)

Table 1. Basic indicators of fish self-sufficiency in B&H (2014-2020.)

Parameter/Year	**2014.**	**2015.**	**2016.**	**2017.**	**2018.**	**2019.**	**2020.**
Production, t	3,358	4,450	4,564	3,761	3,465	3,782	3,655
Import, t	4,609	5,362	5,534	4,977	5,232	7,158	6,545
Export, t	1,686	2,157	2,342	2,045	1,936	2,680	2,958
Import Dependency Ratio (IDR, %)	73.38	70.06	71.35	74.36	77.39	86.66	90.38
Self Sufficiency Ratio (SSR, %)	53.46	58.13	58.85	56.19	51.25	45.79	50.47
Production per capita fish (kg)	0.95	1.26	1.30	1.07	0.99	1.08	1.05
Per capita consumption, kg	1.78	2.18	2.21	1.91	1.93	2.37	2.08

Source: Author's calculation

The degree of self-sufficiency is important because it reflects the current state of affairs, trends are also important because they reflect the longer-term implications (Carpenter and Owen, 2018). The results from **Table 1.** shows that fish production in B&H is oscillating, which is of course compensated by imports.

EUMOFA (2020) also confirms this market situation by stating that the decrease in total production is partially offset by an increase in imports. Fish consumption is also related to consumer habits, lifestyle but also the approach to consumption between and within the household (Karnai 2018., Maciel et al., 2019. and De Bruyn et al., 2021). Can et al. (2015) believe that the amount and frequency of fish consumption can be increased by certain policies, such as training, advertising, and various marketing strategies.

Conclusion

The analysis shows that the fish market of Bosnia and Herzegovina has a strong demand and needs to increase domestic fish production to harmonize the relationship between supply and demand. Production showed small variation during the seven years and a slight increase which is certainly not enough to meet domestic needs for this product.

For the observed period, imports increased more intensively than export. Bosnia and

Herzegovina showed a quantitative deficit in foreign trade exchange in fish during the analyzed period. The smallest deficit was recorded in 2014. while the largest in 2019. The foreign trade deficit increased by slightly less than 700 tons from 2014. to 2020.

During most of the observed seven-year period, there is an imbalance between production and consumption. According to the results of the research, there is a high dependence on the import of fish into the domestic market. Consumption of fish per capita in B&H is significantly below the world and European average. Consumption of fish is largely conditioned by the habits and traditions of consumers in consumption, which is not particularly pronounced in our market. To influence the higher demand and consumption of fish in the diet, it would be necessary to intensify the promotion of fish consumption from the nutritional and health aspect.

Conflict of interests

The authors declare no conflict of interest.

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DYNAMIC CORRELATION BETWEEN SELECTED CEREALS TRADED IN COMMODITY EXCHANGE MARKET IN AP VOJVODINA

Dejan Živkov[1], Biljana Stankov[2], Milijana Roganović[3], Mirela Momčilović[4]

**Corresponding author E-mail: dejanzivkov@gmail.com*

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ABSTRACT

This paper investigates the level of pairwise dynamic correlations between prices of four agricultural commodities – corn, wheat soybean and barley that are traded in Novi Sad commodity exchange market. We use DCC-GARCH model, which is specially designed for this type or research. The results of the estimated dynamic conditional correlations show that low and positive correlation exist between all the pairs of the selected agricultural commodities, where the highest correlation is recorded between wheat and barley (24%), corn-barley pair follows (20%), while all other dynamic correlations are below 20%. The results indicate that price movements of the selected agricultural cereals are independent, which means that price discovery of one agricultural commodity does not provide information about the price of another agricultural commodity. Therefore, our results strongly suggest that traders in this market do not rely on the price co-movements between particular agricultural assets when they plan their selling or buying strategies, but to analyze fundamental macroeconomic factors.

1 Dejan Živkov, Professor, Novi Sad School of Business, Vladimira Perića Valtera 4, Novi Sad, Republic of Serbia, Phone: +381601445598, E-mail: dejanzivkov@gmail.com, ORCID ID (https://orcid.org/0000-0003-2357-3250)

2 Biljana Stankov, Lecturer, Novi Sad School of Business, Vladimira Perića Valtera 4, Novi Sad, Republic of Serbia, Phone: +381605054644, E-mail: bilja.l.stankov@gmail.com , ORCID ID (https://orcid.org/0000-0001-8773-4143)

3 Milijana Roganović, Lecturer, Novi Sad School of Business, Vladimira Perića Valtera 4, Novi Sad, Republic of Serbia, Phone: +381641570331, E-mail: milijanadjordjevic@gmail.com, ORCID ID (https://orcid.org/0000-0002-8476-7086)

4 Mirela Momčilović, Lecturer, Novi Sad School of Business, Vladimira Perića Valtera 4, Novi Sad, Republic of Serbia, Phone: +38163280010, E-mail: bizniscentar@gmail.com , ORCID ID (https://orcid.org/0000-0001-5752-6992)

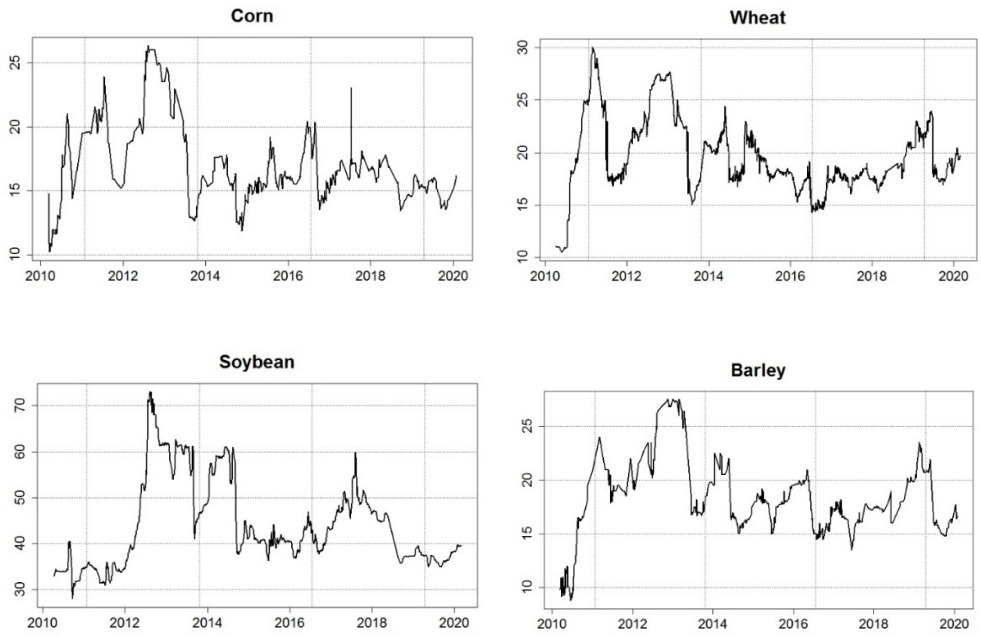
Introduction

Generally speaking, agricultural commodities are closely connected due to numerous reasons. It can be said that these commodities are close substitutes in demand, their production costs are similar and they compete for limited natural resources. In addition, increased financialization of agricultural markets in recent decades, in a form of herd and speculative behaviour, further enhanced interdependence between crop prices. Dawson and White (2002) listed several reasons why commonality between commodity futures (or cash) prices arises. They asserted that macroeconomic fundamentals, such as aggregate demand, inflation, and interest rates, are common factors in determination of commodity prices. Secondly, high correlations between prices of similar commodities may exist because some of them are substitutes or complements in supply or demand. de Nicola et al. (2016) contended that academics and policy makers have an interest to analyse agricultural commodity price co-movements due to potentially large welfare and policy implications. They explained that the presence of synchronized changes in the behaviour of agricultural commodity prices may cast doubts on the competitiveness and efficiency of these markets. Similarly, farmers that grow multiple crops may face themselves with strong income fluctuations owing to the synchronized changes in agricultural prices. As for countries which are dependent on import of agricultural commodities, a simultaneous increase in several commodity prices may generate inflation pressures in these economies, while agricultural commodity exporting countries may experience high volatilities in their export incomes.

Serbia is a country with relatively significant production in agricultural sector, which particularly applies for autonomous province of Vojvodina. According to Gulan (2014), the weight of agricultural production in Serbian GDP is relatively high, ranging between 11.8%-15.5% in the period 2002-2012. Đurić et al. (2017) and Marković et al. (2019) added that agricultural and food sector has an important role in the economic development of the Republic of Serbia, significantly participating in the structure of domestic exports. Having in mind aforementioned, this paper tries to determine a level of dynamic correlations between prices of four cereals – corn, wheat, soybean and barley, which are traded in commodity exchange market in Novi Sad. Several motives prompted us to do this research. Firstly, according to Li and Lu (2012), studies on correlation and cross-correlation in agricultural markets are rare in general, while most of them are related to North American futures contracts. To the best of our knowledge, none of the extant papers have tried to measure correlation between agricultural products traded in Serbian commodity exchange market, and this paper tries to fill this gap. The second motive is more practical. Namely, dynamic correlation coefficients gauge mutual correlation of two assets throughout the particular period and they are time-varying. This means that these measures carry significantly more information than Pearson correlation coefficient that is static by nature, and as such can offer only one average value of correlation for entire period. In addition, it is highly unlikely to assume that correlation is unchangeable throughout the time (see e.g. Onay and Ünal, 2012). Therefore, having on disposal a data about dynamic correlation is important for various

reasons. First of all, dynamic mutual correlation is a primary input in the construction of risk-minimizing portfolio (see e.g. Lee et al., 2014; Asai, 2013; Kang and Yoon, in press). Even more importantly, dynamic correlation can provide useful information for Serbian farmers in a sense that existence of high positive correlation between two agricultural commodities would imply that rise (fall) of one agricultural product means rise (fall) of the other one in some time in the future, and *vice-versa*. This type of knowledge is very useful for agricultural producer when they make their decisions about when to sell their annual harvests. Figure 1 shows empirical dynamics of the selected cereals, and it can be seen that prices of these agricultural commodities are pretty much volatile, but visually, they follow relatively common dynamics. Therefore, the task of this paper is to determine how much price movements of these cereals are synchronized, i.e. whether visual price harmonization that can be seen in Figure 1 is supported by calculated dynamic correlation coefficients.

Figure 1. Empirical dynamics of the selected cereals



Source: Authors' calculations

In order to calculate pairwise dynamic correlations between the selected cereals, we use complex and sophisticated methodology – bivariate Dynamic Conditional Correlation Generalized Autoregressive Conditional Heteroscedasticity model (DCC-GARCH) developed by Engle (2002). More precisely, we want to measure dynamic correlations as accurate as possible, so we, firstly, try to determine the best fitting DCC model. In that process, we estimate DCC-GARCH and DCC-EGARCH models, in combination with normal and Student t multivariate distributions. The former model is symmetric

in the variance, while the latter model can measure asymmetric effect in the variance. The best fitting model is selected by Akaike information criterion, and this model is used subsequently to extract the dynamic conditional correlations. We apply this methodology, because Milani and Ceretta (2014) asserted that correlation is perhaps the most traditional way of measuring the association between two variables, whereas Živkov et al. (2016) contended that it could indicate a more direct interdependence between these two assets. Many recent papers found very appealing DCC-GARCH model for their researches (see e.g. Jones and Olson, 2013; Singhal and Ghosh, 2016; Hou and Li, 2016; Jiang et al., 2019).

Besides introduction, the rest of the paper has the following structure. Second section gives an overview of the existing literature. Third section explains used methodology. Fourth section presents dataset and descriptive statistics. Fifth section presents research results. Sixth section is reserved for the discussion of the results, while the last section concludes.

Literature review

Referring to Boroumand et al. (2014), very few academic papers investigated mutual correlation between agricultural commodities, and this section presents the findings of some papers that did this type of research. For instance, Gardebroek et al. (2016) employed a multivariate GARCH approach to assess the time evolution of conditional correlations and volatility transmission across corn, wheat, and soybeans price returns on a daily, weekly, and monthly basis. They claimed that daily interactions are probably driven by financial transactions in agricultural markets. However, they asserted that this evidence is not supported by increasing trend in the conditional correlations between commodities on a daily basis, whatsoever. Similar results, regarding interdependence (conditional correlations) between markets, they reported on a weekly and monthly basis. The paper of Bonato (2019) studied the dynamics of price correlations and spillover effects in the commodity market, considering the interaction within soft and grain commodities and between these commodities and oil. They found that soft commodities were segmented prior to 2008 and became correlated thereafter, but they claimed that the nature of the increase in correlation is only temporary. On the other hand, they reported significant and positive correlations within grains. The paper of Baffes and Haniotis (2016) considered arguments that cause the agricultural price cycle. Their research focused on six agricultural commodities (maize soybeans, wheat, rice, palm oil and cotton) in order to identify the key quantifiable drivers of their prices. They found that increases in real income negatively affect real agricultural prices, which is consistent with the Engel's Law. Energy prices affect agricultural commodities the most, which is expected, taking into account the energy-intensive nature of agriculture production. Stock-to-use ratios and ex-change rate movements have a lesser extent on agricultural commodities. The cost of capital influences prices only marginally, probably because it not only influences demand, but also evokes a supply response.

Li and Lu (2012) examined the cross-correlation properties of agricultural futures

markets (soy bean, wheat, soy meal and corn) between the US and China. Their results showed that the cross-correlations between the two geographically distant markets for the selected agricultural commodities futures are significantly multifractal. In addition, they discovered that the cross-correlations in the short term are more strongly multifractal, but they are weakly in the long term. Dawson and White (2002) investigated interdependencies between several agricultural futures contracts – barley, cocoa, coffee, sugar and wheat on the LIFFE exchange market. Since barley and wheat are substitutes in demand and supply, they expected for these two to be related, while other pair-wise combinations are expected to be unrelated because they are neither complements nor substitutes. However, their results indicated that the prices of agricultural futures contracts are independent. In other words, there are no interdependencies between any two prices, that is, price discovery of one contract provides no information about others. The paper of Boroumand et al. (2014) researched the correlation structures of a large panel of agricultural commodities prices (cocoa, cotton, palm oil, hides of cattle, soya beans, corn, sugar and beef), covering the period between January 1990 and February 2014. They concluded that strong correlation exists between prices of palm oil, soya beans and corn. On the other hand, their findings suggested that prices of beef, sugar and cocoa are completely independent.

Methodology

For the construction of dynamic correlations, we use bivariate DCC model of Engle (2002). In particular, in order to be as accurate as possible in the estimation process, we consider two univariate GARCH specifications – simple GARCH(1,1) and asymmetric EGARCH(1,1) models, along with two multivariate distributions – normal and Student t. The univariate GARCH(1,1) and EGARCH(1,1) processes in the DCC framework have the form as in the equations (1) and (2), respectively:

$$\sigma_t^2 = c + \alpha\varepsilon_{t-1}^2 + \beta\sigma_{t-1}^2 , \tag{1}$$

$$ln(\sigma_t^2) = c + \beta\, ln(\sigma_{t-1}^2) + \gamma \left| \frac{\varepsilon_{t-1,i}}{\sqrt{\sigma_{t-1}^2}} \right| + \alpha \frac{\varepsilon_{t-1,i}}{\sqrt{\sigma_{t-1}^2}} , \tag{2}$$

where σ_t^2 is a conditional variance of the particular agricultural asset, whereas ε_t^2 describes squared residuals of the univariate GARCH models.

Symbol c denotes constant term, β parameter captures the persistence of volatility, α gauges an ARCH effect, while γ is the coefficient that measures asymmetric response of volatility to positive and negative shocks.

In order to avoid autocorrelation bias, all mean equations are estimated in the autoregression form of order 1, i.e. AR(1). DCC model of Engle (2002) involves two-

stage estimation procedure of the conditional covariance matrix (H_t). In the first stage, each pair of considered agricultural commodities is estimated via GARCH or EGARCH models, and subsequently estimates of standard deviations, $\sqrt{\sigma^2_{ii,t}}$, are acquired. In the second step, asset-return residuals are standardized, i.e. $v_{i,t} = \varepsilon_{i,t}/\sqrt{\sigma^2_{ii,t}}$ where the $v_{i,t}$ is then used to estimate the parameters of the conditional correlation. According to Engle (2002) procedure, the multivariate conditional variance is specified as $H_t = D_t C_t D_t$. Where $D_t = diag(\sqrt{\sigma^2_{11,t}} \dots \sqrt{\sigma^2_{nn,t}})$ and $\sigma^2_{ii,t}\sigma^2_{ii,t}$ represents the conditional variance, which is obtained from some form of a univariate GARCH model in the first stage. The evolution of correlation in the DCC model is presented as:

$$Q_t = (1 - a - b)\bar{Q} + a v_{t-1} v'_{t-1} + \beta Q_{t-1}\,, \tag{3}$$

where *a* and *b* are nonnegative scalar parameters of DCC(1,1) model under condition $a + b < 1$. These parameters measure the effects of previous shocks and previous dynamic conditional correlations on current dynamic conditional correlations, respectively. Symbol $Q_t = [q_{nm,t}]$ describes n × n time-varying covariance matrix of residuals, where i ≠ j in our bivariate model, and n equals two. Symbol $\bar{Q} = E[v_t v'_t]$ signifies a n × n time-invariant variance matrix of v_t. Q_t does not have unit elements on the diagonal, so it is scaled to obtain proper correlation matrix (C_t) according to the following form:

$$C_t = (diag(Q_t))^{-1/2} Q_t (diag(Q_t))^{-1/2} \tag{4}$$

Accordingly, the element of C_t looks like:

$$\rho_{ij,t} = \frac{q_{ij,t}}{\sqrt{q_{ii,t} q_{jj,t}}} = \frac{(1-a-b)\bar{q}_{ij} + a v_{i,t-1} v_{j,t-1} + b q_{ij,t-1}}{\sqrt{\left[(1-a-b)\bar{q}_{ii} + a v^2_{i,t-1} + b q_{ii,t-1}\right]}\sqrt{\left[(1-a-b)\bar{q}_{jj} + a v^2_{j,t-1} + b q_{jj,t-1}\right]}} \tag{5}$$

where i ≠ j and in our bivariate model n is equal to 2. All DCC models were estimated by quasi maximum likelihood (QMLE) technique, which allows asymptotically consistent parameter estimates even if the underlying distribution is not normal, as asserted by Bollerslev and Wooldridge (1992).

Dataset

This paper uses daily prices of four agricultural cereals – corn, wheat, soybean and barley, which are traded in commodity exchange market in Novi Sad. We observe relatively long time-period, from March 2010 to March 2020. All empirical agricultural time-series are transformed into log-returns according to the expression $r_{i,t} = 100 \times \log(P_t/P_{t-1})$, where P_i denotes the closing prices of the selected assets. However, significant shortcoming of these data is the fact that they are not characterized by continuous trading, that is, trading process took place in limited number of days every month, in most 10 days. Also, during one trading day, several transactions were made at different prices. Therefore, we invest a lot of work in order to make usable these data for the software in which calculation were done[5]. In other words, before computational process, we have to calculate average weighted price for every single day in which several transactions were made at different prices. In this way, we get only one trading price per day, throughout the observed sample of 11 years.

After these settings, all agricultural time-series are synchronized according to the existing daily observations, because trading process in commodity market took place in different days for different cereals. More precisely, after synchronization, following synchronized pairs – corn-wheat, corn-soybean, corn-barley, wheat-soybean, wheat-barley and soybean-barley have 1964, 1492, 563, 1298, 478 and 370 daily observations, respectively. It can be noticed that pairs with barley have the lowest number of observations, and the reason lies in the fact that trading with barley happened in the least number of days. Table 1 contains descriptive statistics of log-returns of the selected agricultural commodities, i.e. first four moments, Jarque-Bera test of normality, Ljung-Box test statistics and augmented Dickey-Fuller test of stationarity. Figure 1 shows graphical illustrations of the agricultural log-returns.

Table 1. Descriptive statistics of log-returns of the selected cereals

	Mean	Stan. dev.	Skewness	Kurtosis	JB	LB(Q)	LB(Q^2)	ADF
Corn	0.019	2.721	0.287	36.210	90283.1	0.000	0.000	-64.386
Wheat	0.030	2.667	-0.968	27.083	47769.4	0.000	0.000	-15.729
Soybean	0.062	3.979	-1.847	21.736	5621.9	0.002	0.997	-15.439
Barley	0.138	5.074	-1.753	17.026	3222.2	0.153	0.753	-22.058

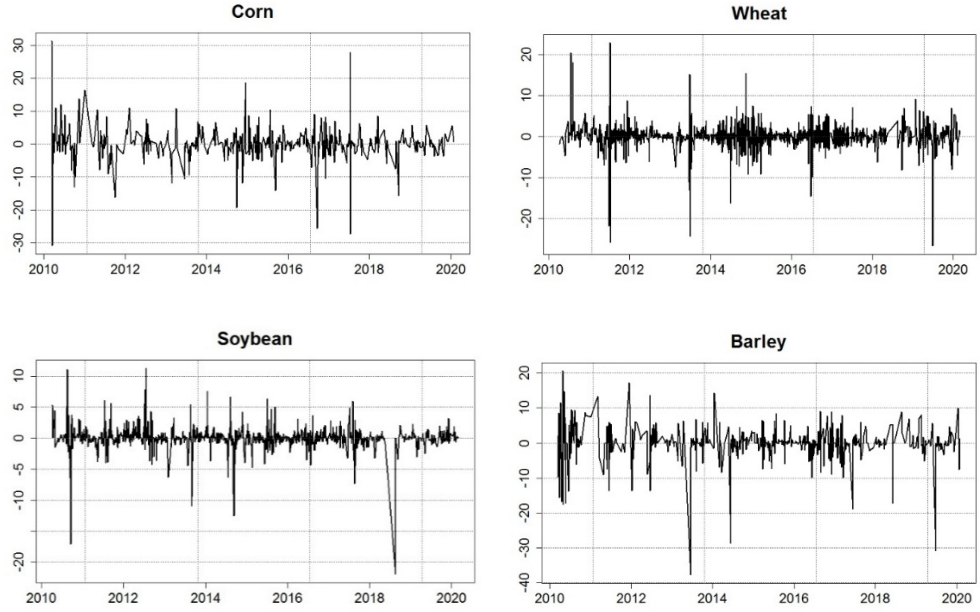
Notes: JB stands for Jarque-Bera coefficients of normality, LB(Q) and LB(Q^2) tests denote p-values of Ljung-Box Q-statistics of level and squared residuals for 20 lags. 1% and 5% critical values for ADF test with 5 lags, assuming only constant, are -3.433 and -2.863, respectively.

Source: Authors' calculations

5 We use OX metrics software for our computations.

According to Table 1, the riskiest agricultural commodity is barley, because it has the highest standard deviation. Most agricultural commodities have negative skewness, which means that most observations are placed left in regard to the mean, and all skewness values significantly deviate from zero, which is the value of the Gaussian distribution. Kurtosis value indicates the presence of fat tails, and it can be seen that all kurtosis values are very high, which means that extreme log-return measures are present. Figure 2 can verify this assertion. Both skewness and kurtosis coefficients significantly diverge from referent values of normal distribution, 0 and 3, which implies that none of the empirical agricultural commodities follow normal distribution. This is corroborated by the very high values of Jarque-Bera coefficients. The presence of serial correlation and heteroscedasticity in the empirical time-series is tested by Ljung-Box Q-statistics for level and squared residuals. All cereals, except barley, has the issue with autocorrelation, while corn and wheat have the problem with time-varying variance. These findings suggest that some form of ARMA-GARCH parameterization might be appropriate, because these models can resolve reported issues. In addition, spurious regression is evaded since ADF test suggests that all selected time-series do not contain unit root, i.e. all time-series are stationary.

Figure 2. Log-returns of the selected cereals



Source: Authors' calculations

Empirical results

This section presents the results of estimated DCC models and calculated dynamic correlations. As have been said earlier, in order to obtain reliable results, we strive to determine the best fitting model before calculation of dynamic correlations. Therefore, we choose between DCC-GARCH and DCC-EGARCH models in combination with multivariate normal and Student t distributions. The decisive criterion is the lowest Akaike information coefficient, and these values are presented in Table 2.

Table 2. Calculated AIC values

		Corn vs Wheat	Corn vs Soybean	Corn vs Barley	Wheat vs Soybean	Wheat vs Barley	Soybean vs Barley
DCC-GARCH	Normal	8.247	7.438	11.161	8.081	11.206	11.276
	Student t	7.751	6.837	10.166	7.026	10.218	10.072
DCC-EGARCH	Normal	8.291	7.396	11.641	8.064	11.501	11.702
	Student t	7.812	6.855	10.968	7.118	10.510	10.519

Source: Authors' calculations

We have six pairs because all agricultural commodities are combined with each other. As Table 2 reveals, all AIC values give an upper hand to DCC-GARCH model with multivariate Student t distribution. After determination of the best fitting DCC model, we present the results of estimated univariate GARCH and multivariate DCC parameters in Table 3.

Table 3. Estimated parameters for DCC-GARCH models

	Corn vs Wheat	Corn vs Soybean	Corn vs Barley	Wheat vs Soybean	Wheat vs Barley	Soybean vs Barley
Panel A: Univariate GARCH estimates						
	Corn	***Corn***	***Corn***	***Wheat***	***Wheat***	***Soybean***
c	0.139***	0.520***	3.865*	0.271	2.528	4.779
α	0.379***	0.642***	0.213	0.263	0.255***	0.161
β	0.697***	0.470***	0.589***	0.783***	0.656***	0.829**
	Wheat	***Soybean***	***Barley***	***Soybean***	***Barley***	***Barley***
c	0.127	0.324**	3.497**	0.625***	3.626	8.325
α	0.237***	0.561**	1.223***	1.083***	1.126***	0.221
β	0.794***	0.454***	0.241**	0.248***	0.286	0.715**
Panel B: DCC estimates						
Average ρ	0.041	0.193	0.200	0.071	0.243	0.159
a	0.007	0.024	0.000	0.021	0.000	0.000
b	0.938***	0.787***	0.908***	0.925***	0.748***	0.868
υ	3.891***	3.192***	2.635***	2.772***	2.588***	2.478***

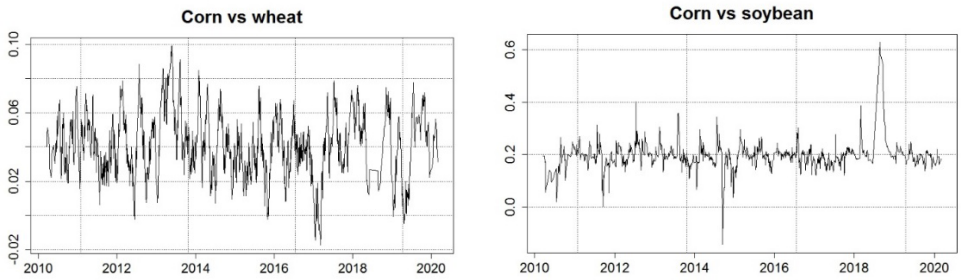
Note: ***, **, * represent statistical significance at the 1%, 5% and 10% level, respectively.

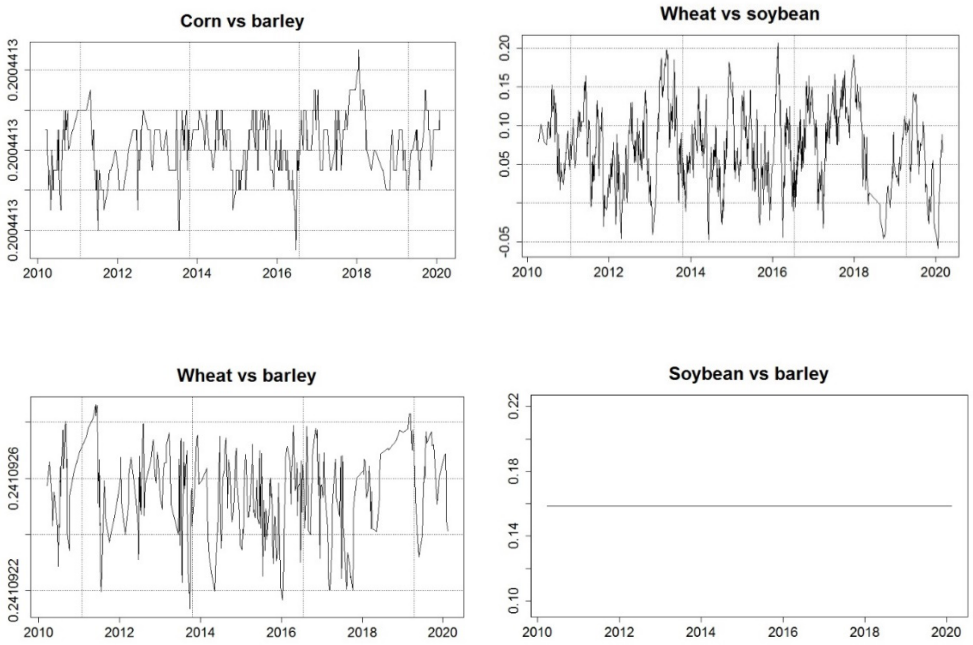
Source: Authors' calculations

Table 3 suggests that majority of the estimated parameters are highly statistically significant, but also some parameters are not significant. As for insignificant α coefficients, it means that shocks in time t-1 do not have an effect on conditional variance. In addition, in majority of estimated univariate GARCH models (Panel A), a high persistence of conditional volatility is observable, which means that $\alpha + \beta > 1$. This drawback could cause a non-stationary volatility in a single-regime GARCH models (see Frommel, 2010). In other words, our models probably bear some flaws, and the reason could line in the nature of the empirical data. In particular, due to relatively limited number of trading days in Novi Sad commodity exchange market, it is possible that high volatility persistence occurs.

As for DCC parameters (Panel b), all *a* parameters are insignificant, while all *b* parameters are highly statistically significant, except for soybean-barley pair. Insignificant *a* parameter implies that previous shocks do not have an influence on current dynamic conditional correlation. It should be said that estimation of statistically significant *b* parameters contributes crucially to the validity of dynamic conditional correlations, i.e. these correlations are then readable and can be interpreted. This contention is in line with Figure 3 presentation, which shows the plots of six dynamic conditional correlations. More specifically, it can be seen that five out of six DCCs are time-varying, while only for soybean-barley pair, DCC is static. The reason probably lies in the fact that *b* is estimated as statistically insignificant for soybean-barley pair, and this parameter is of utter importance for the creation of time-varying correlations. Symbol *υ* stands for the parameter of multivariate Student t distribution, and all these coefficients are highly statistically significant, which means that choice of this distribution is justifiable.

Figure 3. Estimated dynamic conditional correlations for the selected pairs of agricultural commodities





Source: Authors' calculations

Although the findings of the estimated dynamic conditional correlations clearly show that mutual correlations between the selected cereals are time-varying, these oscillations are not particularly significant, while in most instances they barely exist. In other words, according to plots in Figure 3, we find only in pairs of corn-wheat and wheat-soybean relatively significant fluctuations of dynamic correlations. More specifically, in the corn-wheat plot, DCCs oscillates 10% between the lowest and highest correlations, while in the wheat-soybean plot, the oscillations are more expressed, amounting 25% between the highest and the lowest value. However, looking at the corn-barley, wheat barley and soybean-barley plots, these oscillations are less than 1%. It is interesting to notice that all these correlations are estimated between barley and the other commodity grains, and barley has the least trading days in comparison to all other agricultural commodities. This means that lot of empirical observations is lost in the process of data synchronization, which could produce an estimation bias in DCC-GARCH models.

Besides, it is interesting to note that all dynamic correlations are not very high throughout the observed sample, as a matter of fact, they are pretty low. This is visible in Figure 3, while Panel B of Table 2 contains the exact average values of dynamic conditional correlations, and it can be seen that majority of DCCs are below 20%, which is very low. In other words, only wheat-barley pair has an average correlation above 20%, and it amounts 24%, whereas the lowest correlations are found for corn-wheat and wheat-soybean pairs, with the value of 4% and 7% respectively.

The findings of low correlations among agricultural commodities are not surprising, and can be related with other studies in this field. For instance, our results coincide very well with the paper of Gardebroek et al. (2016). These authors investigated dynamic correlation between three spot prices of corn, wheat and soybean, traded in the Chicago Board of Trade (CBOT). They asserted that despite the so called "financialization" of agricultural markets that happened in the past decades, a little evidence has been found that this was a major reason for a stronger interdependence in conditional returns and volatilities between agricultural commodities. They found volatility interactions in weekly and monthly returns, but not in daily returns. Their explanation is that former interactions are less likely driven by herding or speculative behaviour, but instead could be better explained by more fundamental factors such as interdependence across input and output markets and demand substitution. Also, these authors reported somewhat stronger correlation between corn and soybean, as we did, and they explained these findings by the fact that corn and soybeans have strong structural connections in land, fuel and feed markets.

In addition, we also can find the connection between our results and the paper of Bonato (2019). This author researched the changes in the dynamics of price correlations and spillover effects in the agricultural commodity market, using eight major US-traded futures prices (corn, soybeans, wheat, and soybean oil for grain commodities, and coffee, cotton, sugar, and cocoa for soft commodities). They revealed that only soft commodities were segmented prior to 2008 and became correlated thereafter, but the nature of this increase in correlation is only temporary. On the other hand, correlations within grain commodities, which were already significant and positive, remained relatively stable between 2002 and 2017, which indicates that this group has been less affected by the 2008 commodity market turmoil. Lastly, we find an explanation in the study of Dawson and White (2002) why wheat-barley combination has the highest average dynamic correlation among all the pairs. They examined long-run interdependencies between the agricultural futures contracts of barley, cocoa, coffee, sugar, and wheat, traded in the LIFFE exchange market, using Johansen's cointegration procedure. They reported long-run connection between wheat and barley because these commodity grains are substitutes in demand and supply and, thus, they are expected to be related, which coincides with our results. On the other hand, they found other pair-wise combinations as unrelated because they are neither complements nor substitutes in either production or consumption.

Discussion of the results

This section tries to explain the implications of the results as well as to see how the results can be used in practical purposes. According to the results, all dynamic correlations are positive and relatively low, with very limited scope of oscillations. From the market point of view, this means that price dynamics of the selected agricultural grains is independent, which implies that discovery of the price of one agricultural commodity does not provide information about the price of another

agricultural commodity. This results strongly indicate that participants in Novi Sad commodity exchange market, sellers and buyers, cannot rely on the price co-movements between particular agricultural assets when they plan their selling or buying strategies. Dawson and White (2002) added that low correlation between agricultural assets signals that traders in market probably put a greater effort to assess the effect of macroeconomic fundamentals on agricultural prices than to determine their selling strategies by following the dynamics of other agricultural commodities. Knowing the nature of Novi Sad spot commodity exchange market, this finding is not unexpected. In other words, the participants in this market are local farmers that act as sellers with short position and various traders that take long position with the purpose to use agricultural commodities in further production process or to resell them in the global market. Therefore, our suggestion for traders in Novi Sad exchange market is to pay more attention on the analysis of macroeconomic factors and global movements of agricultural commodities, whereas dynamic correlations of agricultural prices in Novi Sad exchange market can be disregarded, because they do not provide relevant and useful information for traders' strategies.

Another conclusion that can be drawn from low correlation findings is that speculators do not participate in Novi Sad exchange market. Speculative activities certainly contribute to the liquidity of the market and the convergence of the prices, but interest of speculators is not to use agricultural commodities for real purposes, but to make a profit in price differences. Since Novi Sad commodity exchange do not trade with futures contracts, speculative activities are not present in this market, which implies that macroeconomic factors, domestic and global, play a key role in determination of agricultural prices. We can assert that the absence of speculations in this market also means the absence of herd and panic behaviour in this market. This contention indirectly means that traders on this market tend to specialize and focus their activities in some particular commodity of their interest, and this is the reason why relatively small number of trading transactions exist in one year.

Lastly, it should be mentioned that existence of low correlation between the assets are the basic precondition for the successful portfolio diversification. In other words, combination of agricultural assets from Novi Sad exchange market in various portfolios could be potentially beneficial in the risk minimizing process. However, the problem arises because this market does not trade with futures contracts that would be used for these purposes, but only with real transactions that imply physical delivery of the purchased commodities. Therefore, continuously low correlation between agricultural commodities in Novi Sad exchange market cannot be used in portfolio construction and risk-minimizing efforts.

Summary and conclusion

This paper investigates the level of pairwise dynamic correlations between prices of four agricultural commodities – corn, wheat soybean and barley, that are traded in Novi Sad commodity exchange market, observing the period of 11 years. For the research

purposes, we use complex and elaborate methodological approach – DCC-GARCH model of Engle (2002). Before the estimation process, we have to adjust the empirical time-series and make them usable for the software. In other words, relatively low number of trading days is characteristic for all agricultural commodities, whereas some empirical data are lost in the process of time-series synchronization. This is particularly true for pars with barley. As a consequence, possible estimation bias could be present, particularly for pairs with barley.

The results of the estimated dynamic conditional correlations show that low and positive correlation exist between all the pairs of the selected agricultural commodities. In other words, the highest correlation is recorded between wheat and barley, and it amounts on average 24%, corn-barley pair follows with 20%, while all other dynamic correlations are below 20%. In addition, the oscillations of dynamic correlations are not particularly significant, while in most cases they barely exist. More precisely, only corn-wheat and wheat-soybean pairs have relatively significant fluctuations of dynamic correlations, with 10% and 25%, respectively. Our results concur very well with the finding of other studies, which also found relatively low correlation or no correlation at all between agricultural commodities. These findings indicate that price movements of the selected agricultural cereals are independent, meaning that price discovery of one agricultural commodity does not provide information about the price of another agricultural commodity. Therefore, we can firmly assert that traders in Novi Sad exchange market do not rely on the price co-movements between particular agricultural assets when they plan their selling or buying strategies. Novi Sad commodity exchange do not trade with futures contracts, thus speculative activities are not present in this market. This implies that price movements in this market do not happen as an aftermath of speculations or increased liquidity, but rather macroeconomic factors (domestic and global) play a key role in determination of these prices.

This study provides an insight about the nature of dynamic correlations between the selected agricultural commodities in Novi Sad exchange market, and these results can be interesting for traders in this market. Also, the paper explains what is the relevance of the results and how (whether) they can be used in practical purposes. Due to the existence of possible estimation bias in some estimated dynamic correlations that is probably caused by discontinuous trading in this market, future papers can address this topic, applying different methodological approaches. Extended research in this subject will confirm or refute our results, contributing significantly to the robustness of overall findings.

Conflict of interests

The authors declare no conflict of interest.

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POTENTIAL OF ORGANIC PRODUCTION FROM THE PERSPECTIVE OF YOUTH IN SERBIA

Marija Bajagić[1], Nemanja Stošić[2], Vera Rašković[3], Vojin Cvijanović [4], Vojin Đukić [5]

**Corresponding author E-mail: bajagicmarija@yahoo.com*

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ABSTRACT

Organic agriculture in Serbia is represented by only 0.4% of total agricultural production, which places Serbia at the back of list of European countries and countries in the region. Such production should be part of a rural development strategy. The aim of this work was to establish what would be the motivation of young people to start organic production, on which the perspective of this production depends. A survey conducted on 100 young people, students of the Unit for Agricultural and Business Studies and Tourism was used as a method of work. The results of the survey were summarized, presented as a percentage and described. The results of the survey indicate that 70% of respondents would like to engage in organic plant production, primarily due to the production of high quality food and environmental protection. However, the main shortcomings are insufficient information, insufficient financial support, difficult plant protection and insufficiently organized purchase of products. Most young people would choose to engage in fruit growing (53%).

1 Marija Bajagić, Ph.D, Assistant Professor, University Bijeljina, Faculty of Agriculture, Pavlovića put bb, 76300 Bijeljina, Republic Srpska, Bosnia and Herzegovina, Phone: +381638858185, E-mail: bajagicmarija@yahoo.com, ORCID ID (https://orcid.org/0000-0001-9537-8302)

2 Nemanja Stošić, Ph.D, Lecturer, Academy of applied studies Šabac, Unit for Agricultural and Business Studies and Tourism, Vojvode Putnika no. 56, 15000 Šabac, Serbia, Phone: +38115344580, E-mail: nemanjastosic87@gmail.com, ORCID ID (https://orcid.org/ 0000-0002-7892-9106)

3 Vera Rašković, Ph.D, Full Professor, Academy of applied studies Šabac, Unit for Agricultural and Business Studies and Tourism, Vojvode Putnika no. 56, 15000 Šabac, Serbia, Phone: +38115344580, E-mail: vera.raskovic75@gmail.com, ORCID ID (https://orcid.org/ 0000-0002-2565-5623)

4 Vojin Cvijanović, Doctoral student, Institute for Science Application in Agriculture, Bulevar despota Stefana no. 68b, 11000 Belgrade, Serbia, Phone: +381637277981, E-mail: cvija91@yahoo.com, ORCID ID (https://orcid.org/0000-0002-1347-952X)

5 Vojin Đukić, Ph.D, Senior Eesearch Associate, Institute of Field and Vegetable Crops Novi Sad, Maksima Gorkog no. 30, 21101 Novi Sad, Serbia, Phone: +381214898100, E-mail: vojin.djukic@nsseme.com, ORCID ID (https://orcid.org/0000-0002-6615-805X)

Introduction

The development of agriculture has long relied on intensive conventional production with the aim of economic, quantitative growth of agricultural production and environmental degradation. In order to reduce environmental degradation and provide health-safe food, agricultural production is undergoing certain transformations today. One of the key facts for agriculture is that it has a special ecological role due to its direct impact on ecosystems, food safety and the state of rural areas (Brzezina et al., 2017). Also, Jespersen et al. (2017) cite the need to increase the role of agriculture as a sector, as it provides not only market goods but also public goods such as the environment, biodiversity and rural sustainability.

This indicates the need to find new models of agriculture, which according to Łuczka et al. (2021) is based on economic efficiency and sustainable agriculture. The model of sustainable agriculture is based on the integration of economic, social and environmental goals. UNEP (2010) defines the principle of sustainable development, which implies the use of environmental resources in quantities that do not exceed the ability of ecosystems to renew them. The functioning of sustainable development is influenced by various alternative agricultural systems that promote low-input agriculture, integrated crop management, precision agriculture and organic farming. (Gebska et al., 2020).

According to Reganold and Wachter (2016), organic agriculture (biological or organic) is based on the integration of traditional agricultural production methods with modern technological processes in agriculture, but without the use of synthetic mineral fertilizers and pesticides. It is clearly defined by law, with a series of measures that must be respected. Research by Lernoud and Willer (2017) shows that today there are 283 certification bodies in 179 countries around the world where organic production takes place. Organic production in Serbia is becoming more and more popular and economically important, thanks to the potentials that are primarily reflected in the fragmented property and land that is not contaminated with harmful substances.

So far, small and fragmented production of organic food has been developed in Serbia. Curić and Ceranić (2011) state that this type of production has significant opportunities for growth, but very important weaknesses and limitations have been noticed. Serbia has great potential for organic production, which is reflected in favorable climatic conditions, fertile and still slightly polluted land and other natural resources, as well as the proximity of a large and ever-growing organic food market in the EU (Cvijanović et al., 2013, Lakićević et al., 2021; Simić et al., 2021). Berenji et al. (2013) conclude that in developed EU countries, the market for organic products grows by an average of 10% annually, while this increase is not accompanied by growth in production, which provides a chance for Serbian products. Lazic et al. (2008) suggest that based on the specifics of the agroecosystem on which organic ecological agriculture is performed, it is necessary to define the principles of good agricultural practice, ie the way of work and production for each produced system separately. During the last five years, the certified area has increased significantly and it is very difficult to collect reliable data

on the income of the sector because in Serbia there are still no official records of data on organic production (Stefanović et al., 2010). According to the records of the Ministry for Agriculture, Forestry and Water Management in 2018, the number of registered producers of organic products who have a certificate was 500, of which 253 producers are individual producers. Berenji et al. (2013) believe that one of the main reasons hindering the development of the organic sector in addition to the shortcomings of modern technologies is the low level of knowledge in the organic production sector and the lack of systematic cooperation and connection between the private sector and science. Organic production, although based on traditional production, differs from food production 100 years ago, since pesticides were not used at the time. On the other hand, air quality is different today, as is soil and water quality (Dubrovsky et al., 2010; Pavlović et al., 2021). Without innovative solutions applicable in our production practice, further development and raising the competitiveness of the Serbian organic sector is impossible (Cvijanović et al., 2020).

The concept of organic agricultural production represents a development opportunity for the Republic of Serbia. Namely, Serbia is a country in which agriculture is the dominant economic activity and a country that has the opportunities and resources to develop a competitive sector of organic production. In this regard, one of Serbia's chances is to place a significant amount of organic products on the market. In recent years, interest in this type of production in Serbia has grown significantly. However, in addition to the growing interest, there are still obstacles that prevent the development of this form of agriculture. Accordingly, the development of organic agriculture in Serbia depends on: increasing the area under organic products, increasing exports, interest, education and information on organic production, reducing migration to larger urban areas, preserving the environment and more..

The aim of the research

In spite of the fact that in the last few years there has been an increase in the number of young people engaged in organic farming, Serbia is still lagging behind the countries in the EU. According to the records of the Association of Young Farmers, only 5% belong to young people in total agricultural production. The data on the number of young producers who are focused on organic production is unknown. The main problem for the development of organic production is the acquisition of new knowledge and the application of innovations as well as the poor age structure of the population in rural areas. The development of organic production should be focused on animating young people and creating infrastructure in rural areas, learning about natural resources, economic viability and legal regulations.

Material and method of work

The main goal of this research is to describe and analyze the motives of young people to start organic production. In addition, the research analyzed the pace of development, production and the area of organic production.

This paper is based on the method of data collected through surveys. The survey was conducted indirectly, by filling out a questionnaire in September 2021. 100 young people, students of the the Unit for Agricultural and Business Studies and Tourism, Academy of applied studies Šabac, were selected on the basis of a completely random sample.

The survey consists of 10 questions with offered answers (*Table 1*). Interpretations of data collected by the survey are presented descriptively, tabularly and Figure ically.

Table 1. Appearance of the survey used in the research

1. Do you know anyone who is involved in organic production?	1. Yes 2. No
2. Are you informed with the basic differences between conventional and organic production?	1. Yes 2. No
3. Would you consider starting organic production?	1. Yes 2. No
4. What do you consider the risks of starting organic production? (you can choose one or more answers offered, or add another answer)	1. Inadequate location 2. Insufficient information 3. Insufficient financial support 4. Unorganized redemption 5. Lower yields 6. Difficult protection 7. Large labor force participation 8. Specify additional risk:
5. If you decided to engage in organic production, in which area would it be? (circle one or more answers)	1. Field crops 2. Fruit growing 3. Vegetables crops 4. Fodder plants 5. Medicinal and spicy herbs 6. Livestock 7. Livestock-dairy 8. Beekeeping 9. Fisheries 10. Combined organic farm with combined plant and livestock production
6. How you would certify the product?	1. Independently 2. As part of a group certificate
7. Do you think that subsidies for organic production, which are 4 times higher than subsidies for conventional production, are a sufficient motive to start organic production?	1. Yes 2. No
8. If you think that additional motives are needed to start organic production, state which ones.	1. I do not think that additional motives are needed. 2. Additional motives are:
9. If you think that organic production has advantages over conventional production, state what those advantages are.	1. I think there are no advantages. 2. The advantages are (add):
10. I think that Serbia has the potential for the development of organic agriculture and to be a significant exporter.	1. Yes 2. No

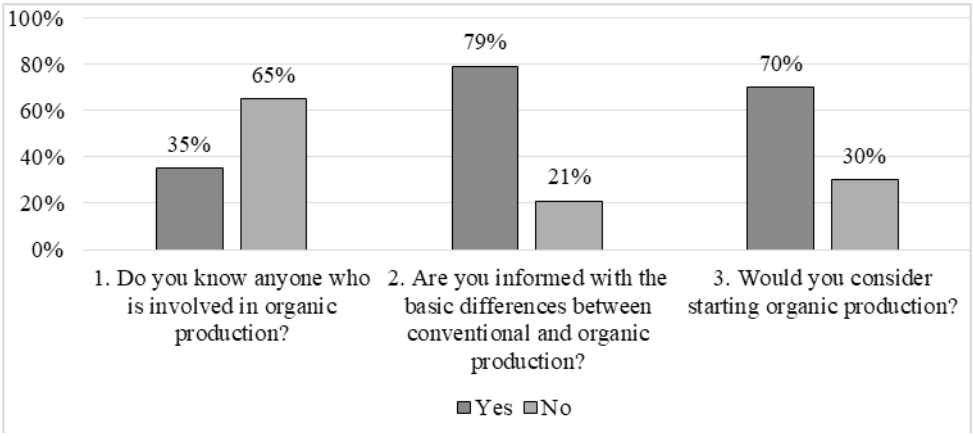
Source: Authors

Results and discussion

The results of the survey, conducted by the authors of the paper, show that 35% of students know individual producers engaged in organic production, while almost twice as many (65%) do not know anyone (*Figure 1; Question 1*). This can be explained by the fact that the production of organic food is still insufficiently developed in our country. The same chart shows a positive increase in the level of education, awareness and information of students (79%) about organic production and its products, compared to the number of respondents who answered negatively (21%), (*Figure 1; Question 2*). On *Question 3* (Would you consider organic production?), 70% of respondents have a positive opinion, while 30% of respondents are not interested (*Figure 1*). The belief of the respondents that they see their future in the production of organic products, relies on the fact of preserving the environment and the characteristic way of life and tradition of small farms, which was confirmed by Jonathan (2009).

Serbia abounds in favorable biological and climatic conditions for the development of organic production. However, there are a number of reasons that manufacturers encounter when switching or engaging in this production.

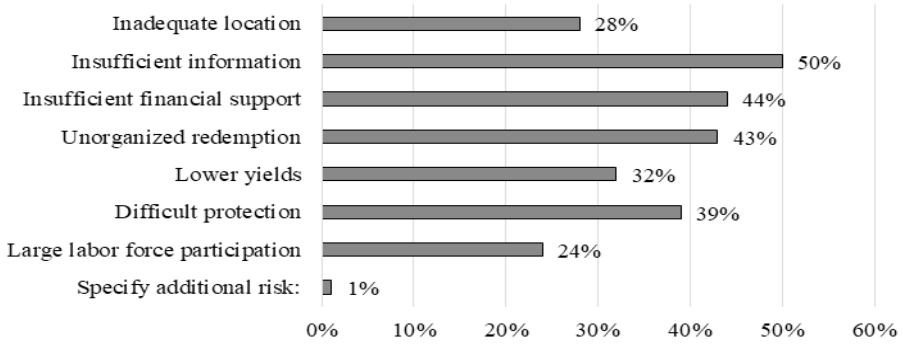
Figure 1. Results of the survey questionnaire **(***question 1, 2 and 3)*



Source: Authors

To question number 4 (*Figure 2*) „What do you consider the risks of starting organic production", respondents answered that the greatest risk is insufficient information (50%), which implies that education of all participants in organic agriculture is needed, from agricultural advisors, through farmers and consumers. Risks, such as insufficient financial support (44%) and unorganized redemption (43%) can be attributed to the action of market and political-legal factors. The results are correlated with the research of Ilić-Kosanović et al. (2019), who state that 42.7% of respondents from two villages in the municipality of Kraljevo believe that financial inputs are a significant factor in organic production.

Figure 2. Results of the survey questionnaire **(***question 4)*

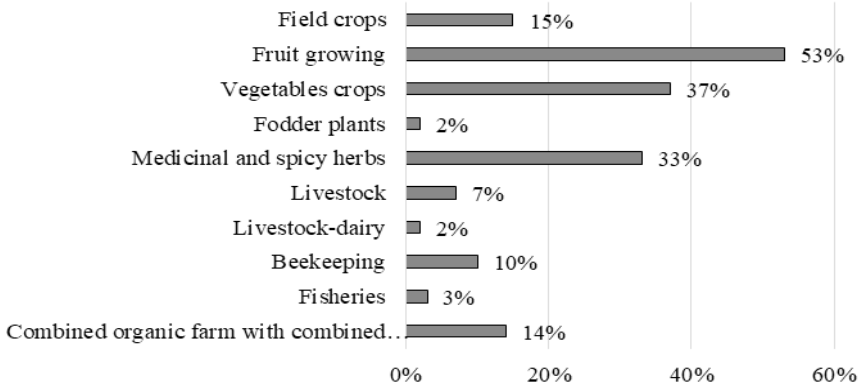


Source: Authors

According to further risk analysis, 39% of respondents believe that crop protection is a common problem. Considering that the means of protection in organic production are strictly controlled, and that there are few of them on our market, it leads to lower yields, which 32% of respondents confirm. Inadequate locations, as a risk, were mentioned by 28% of respondents, while 24% of respondents believe that it is difficult to provide a large number of manpower in production. For additional risk (1%) are global climate change, such as drought, which is increasingly negatively affecting agricultural production.

The largest number of respondents (53%) would opt for organic fruit production (*Figure 3; Question 5*). This can be attributed to the large production and export of raspberries as a fruit in the Sabac district. Furthermore, 37% of respondents are interested in vegetables, 33% in medicinal and spice plants, 15% in farming and 10% in beekeeping. A small percentage of respondents would be engaged in animal husbandry (7%), fishing (3%), forage production (2%) and dairy (2%). Combined organic farming, with combined plant and livestock production, would be chosen by 14% of respondents.

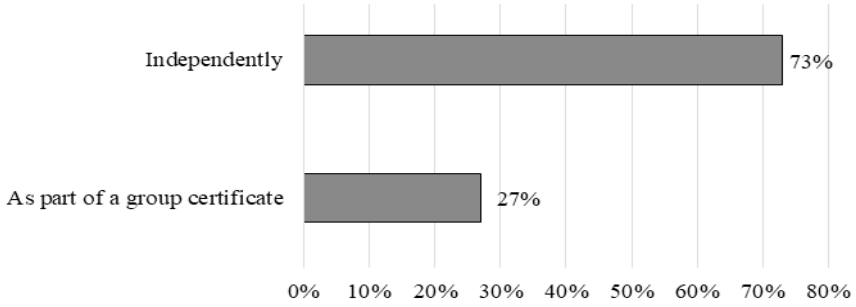
Figure 3. Results of the survey questionnaire **(***question 5)*



Source: Authors

The main difference between organic production and other production methods is in the certification process that is legally prescribed. Obtaining a certificate provides the opportunity to place products on the market at higher prices compared to conventionally produced goods. The results of the survey on the choice of obtaining a certificate show that 73% of respondents would opt for independent certification, while 27% would access group certification (*Figure 4; Question 6*).

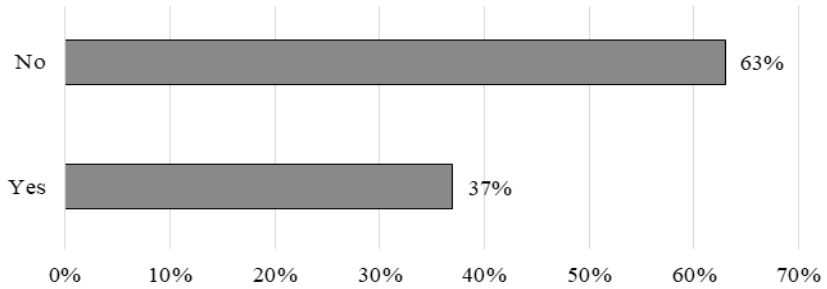
Figure 4. Results of the survey questionnaire **(***question 6)*



Source: Authors

Rozman et al. (2013) states that in order to encourage organic production, the focus should be on technology development and financing. There are various types of subsidies from the budget of the Republic of Serbia, and the possibility of financing can be through IPARD - Instrument for Pre-Accession Assistance for Rural Development (IPARD I and IPARD II). Vehapi & Dolićanin (2016) explain that organic food, products and their consumption, is a new product, and that attention should be focused on understanding the different motives and attitudes of producers and consumers. When it comes exclusively to the motive of subsidies for the start of organic production, the results of the survey show that in 37% of respondents this motive would be sufficient, while 63% of respondents answered negatively (*Figure 5; Question 7*).

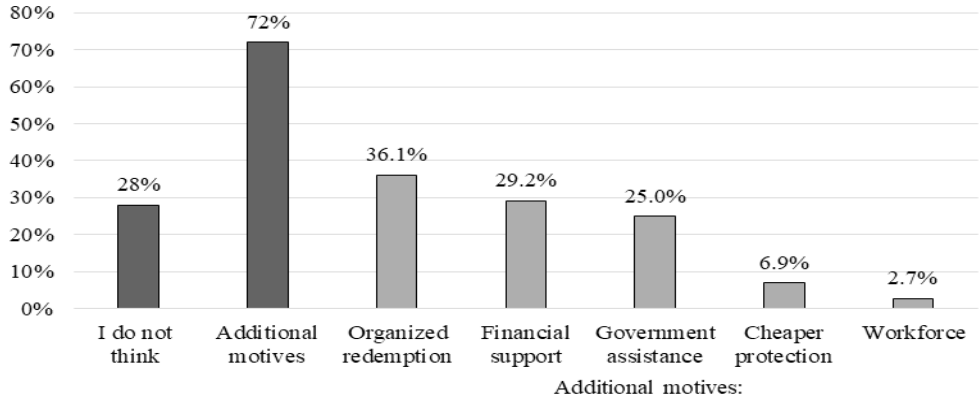
Figure 5. Results of the survey questionnaire **(***question 7)*



Source: Authors

Continuing with the previous question, 28% of respondents believe that no additional motives are needed to start organic production, while 72% of respondents attribute additional motives (*Figure 6; Question 8*). Of the additional motives, organized redemption was mentioned as the most important with 36.1% of respondents, followed by financial (29.2%) and other state aid (25%). Less important, but not negligible motives are cheaper protection (6.9%) and labor (2.7% of respondents).

Figure 6. Results of the survey questionnaire **(***question 8)*

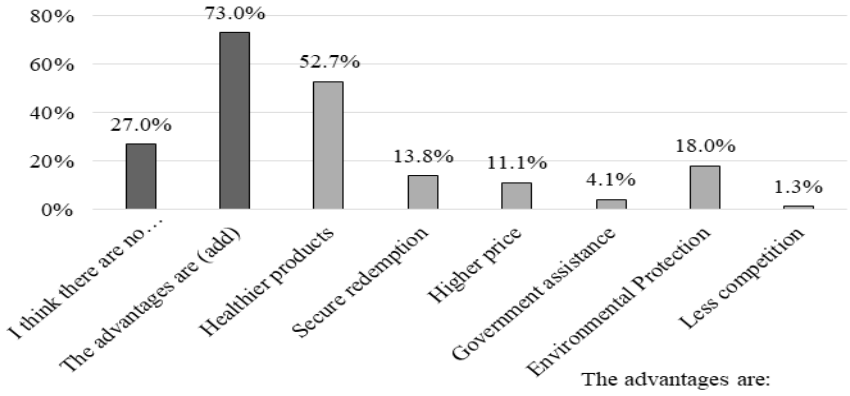


Source: Authors

The advantage of organic production compared to conventional production is present in 73% answers of respondents, while 27% of respondents think that there is no advantage (*Figure 7; Question 9*).

The advantages mentioned by the respondents in the first place were healthier and safer product (52.7% of respondents), safe purchase (13.8%), higher product price (11.1%) and environmental protection (18.0%). Somewhat less advantages are government assistance (4.1%) and less competition in the market (1.3%).

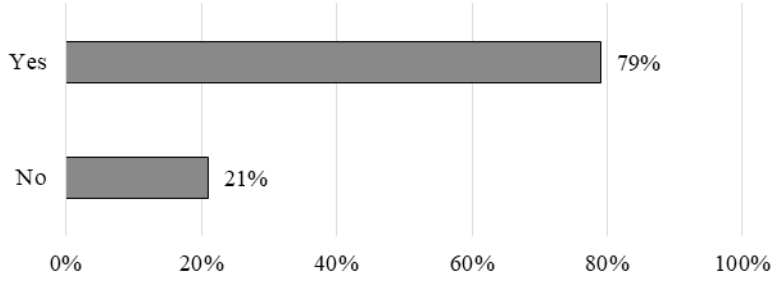
Figure 7. Results of the survey questionnaire **(***question 9)*



Source: Authors

In the case of the question 10 (Do I think that Serbia has the potential to develop organic agriculture and be a significant exporter?), which is also the last question of the survey, 79% of respondents think it has potential, while 21% of respondents think it is impossible (*Figure 8; Question 10*).

Figure 8. Results of the survey questionnaire **(***question 10)*



Source: Authors

One of the main shortcomings is the insufficiently developed awareness of the importance of organic production. In order to overcome this obstacle or problem, consumers need to be constantly informed about the benefits they receive from organic products. For example, the higher prices they pay for organic products in the long run, are not so high, since consuming unsafe food endangers health and thus allocates high financial resources for treatment. Among the disadvantages there are listed the distrust in organic products and the unrecognizability of organic products labels by consumers.

Also, another form of overcoming this obstacle and limitation is the form of acquiring a culture of consuming organic food, which is very low in Serbia, as well as educating the younger population to come to terms with the fact that organic food is a source of human health and environmental protection. This indicates the need to be initiated an action on development of awareness of an importance of the health-safe food for the younger population by educational institutions.

Analysis of the pace of development, production and areas of organic production

In the last ten years, the number of producers involved in organic production has been constantly growing (*Table 2*.). The reason for the larger number of subcontractors is the method of group certification approach, which has proven to be successful in our country because in most cases it is a production intended for export. However, during 2019, the number of subcontractors decreased, and the number of producers who have a direct contract with authorized control organizations increased, which is not a negligible figure.

Table 2. Organic producers in the Republic of Serbia in the 2010-2019 period

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number of certificate holders	137	323	237	258	291	334	390	434	500	534
Number of subcontractors	/	/	836	970	1.575	1.955	2.404	5.719	6.206	5.727
Total	137	323	1.073	1.228	1.866	2.289	2.794	6.153	6.706	6.261

Source: http://www.minpolj.gov.rs/

Total areas under organic production for the period 2010-2019 also had a trend of exponential growth. The total area under organic production in 2019 was 21,265 ha, which is 17.73% more than in the multi-year period 2010-2019 (total area 119,904 ha) (*Table 3.*). According to the data, it should be noted that the areas used for collecting organic wild plant species from natural habitats are not included, given that in Serbia there is still no official methodology based on which relevant data on the total area can be obtained (Simić, 2021).

Table 3. Organic production areas in the Republic of Serbia in the 2010-2019 period

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Organic production areas (ha)	5.855	6.335	6.340	8.228	9.548	15.298	14.358	13.423	19.254	21.265
Total cultivated area (ha)	2.784	3.007	5.364	5.355	7.999	13.398	12.929	11.875	13.723	15.915
Meadows and pastures	3.071	3.327	976	2.873	1.549	1.900	1.429	1.548	5.531	5.350

Source: http://www.minpolj.gov.rs/

According to the index level of the total organic plant production in 2019, the most represented was the category of fruit production with 5,324 ha or 33.45% (*Table 4.*). This is followed by the production of cereals with 4,788 ha, or 30.08%, while the production of vegetables has been declining since 2018 (199 ha), and in 2019 it amounted to only 184 ha.

Table 4. Structure of organic plant production in the Republic of Serbia (2012-2019)

Production type (ha)	2012	2013	2014	2015	2016	2017	2018	2019	%
Cereals	2.522	2.273	2.829	4.252	4.607	3.662	3.614	4.788	30,08
Industrial plants	541	673	1.228	2.674	2.918	2.291	1.962	2.226	13,99
Fodder plants	663	107	1.204	1.440	1.349	1.211	1.336	1.797	11,29
Vegetables	114	1.484	154	171	184	230	199	184	1,16
Fruits and vines	1.416	595	2.208	2.895	3.531	4.056	5.883	5.324	33,45

Production type (ha)	2012	2013	2014	2015	2016	2017	2018	2019	%
Medicinal and aromatic herbs	28	133	61	71	113	115	193	261	1,64
Other	80	90	316	1.895	227	312	536	1.332	8,37
Total cultivated area	5.364	5.355	7.999	13.398	12.929	11.874	13.723	15.915	100,00
Meadows / pastures	976	2.873	1.549	1.900	1.429	1.548	5.531	5.349	

Source: http://www.minpolj.gov.rs/

Regulations for organic livestock production are much more demanding than for the plant production. They refer to special methods of maintenance of facilities for keeping animals, procurement of animals from other farms and feeding and treatment of animals, as well as clearly defined conditions for processing, storage and transport in order to place on the market. The highest increase in the number of farmed animals belongs to poultry (17,880), beekeeping societies (9,969), sheep (6,099) and cattle (3,556), (*Table 5.*). The sharp increase in poultry farming, by 165% and the number of beekeepers, by 225% compared to 2018, is explained by group certification, which is increasingly represented in organic livestock production.

Table 5. Organic livestock production in the Republic of Serbia (2012-2019)

Animal species	2012	2013	2014	2015	2016	2017	2018	2019
Sheep	2.837	4.031	3.153	4.848	4.378	4.665	5.138	6.099
Pigs	206	175	76	232	283	87	284	315
Cattle	1.428	2.176	2.726	2.746	2.895	3.094	3.594	3.556
Goats	211	946	1.154	1.686	1.406	2.048	1.486	536
Poultry	2.034	1.390	1.140	1.380	3.158	5.415	6.735	17.880
Horses	66	210	173	218	165	177	114	88
Society of Beekeepers	961	1.940	894	2.504	2.878	2.307	3.061	9.969

Source: http://www.minpolj.gov.rs/

Conclusion

The opportunity for the development of organic production in Serbia is extremely great. Production is based on the rational use of renewable resources and environmental protection, which is the basis for ensuring long-term stability and quality of agricultural production and products. Serbia is rich in areas that are still unpolluted, which can provide young respondents with a faster certificate for organic plant or livestock production. In addition, producers who opt for this type of production must be prepared for larger financial investments. On the other hand, organically produced food brings great profits to producers because organically produced products are 20 to 40% more expensive than conventionally produced products, depending on the degree of processing.

In general, the survey shows that the younger population is familiar with the benefits and importance of organic production. Based on the conducted research, it can be concluded that health is the most important motive for young people to produce organic food. They are additionally acquainted with the risks, as well as the motives for a comprehensive start of dealing with this type of production, which is reflected in insufficient information, financial support, plant protection and market security.

Like most research that has limitations, mainly due to the small sample, additional and extensive research.This research could include a larger number of young people from one or more counties, due to the generation of data both to address certain challenges and to accelerate efforts to achieve the sustainable development goal defined by 2030. Also, the conclusions of the research can be useful to creators and holders of economic policy, who create and implement strategies for sustainable rural development and environmental protection, because the benefits of organic production are multiple and long-term.

Conflict of interests

The authors declare no conflict of interest.

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IS CAPITAL STRUCTURE IMPORTANT FOR THE VALUE OF AGRO-FOOD CORPORATIONS IN SERBIA?

Marina Janković-Perić[1], Dejan Jovanović[2], Aleksandra Fedajev[3]

**Corresponding author E-mail: marina.jankovic@vipos.edu.rs*

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ABSTRACT

The research aims to consider the nature of the influence of capital structure on the value of the corporations from the agro-food sector in Serbia. A panel regression analysis was used to test the hypotheses. The research covered the period from 2011 to 2018, and the sample consisted of 14 agro-food corporations whose shares are on the regulated market of the Belgrade Stock Exchange. The obtained results indicate that the capital structure has a statistically significant impact on the value of agro-food corporations and that the profitability of investment projects determines the nature of that impact. Consequently, the financial managers of agro-food corporations must consider the decision on the choice of capital structure as one of the key issues in the process of generating and increasing the corporation value.

Introduction

Given that a corporation creates value if the expected rate of return is higher than the cost of capital, it can be said that financial decisions are essential to the value creation process. Namely, financial decisions directly determine, from the aspect of origin and maturity, the structure of financing sources, which consequently has an impact on the price of the corporation's capital, as one of the drivers of value. Accordingly,

1 Marina Janković-Perić, PhD, Senior lecturer, Western Serbia Academy of Applied Studies, Vuka Karadžića 3a, 14000 Valjevo. Phone: +38114224735, +38114232644. E-mail: marina.jankovic@vipos.edu.rs, ORCID ID (https://orcid.org/0000-0003-0181-3604)

2 Dejan Jovanović, PhD, Assistant Professor, Faculty of Economics University of Kragujevac, Liceja Kneževine Srbije 3, 34000 Kragujevac, Phone: +38134303500, +38134303516. E-mail: djovanovic@kg.ac.rs, ORCID ID (https://orcid.org/0000-0002-0424-0656)

3 Aleksandra Fedajev, PhD, Associate Professor, Technical Faculty in Bor, Vojske Jugoslavije 12, 19210 Bor, Phone: +38130421078, +38130424555. E-mail: afedajev@tfbor.bg.ac.rs, ORCID ID (https://orcid.org/0000-0002-6974-6631)

in financial decision-making, management should strive to establish such a capital structure that will result in a minimum cost of capital and a maximum corporation value. Recognizing the importance of the issue of the capital structure optimization, given the return on assets of the corporation and in specific market conditions, the focus in this paper will be on corporations that belong to the agro-food sector of Serbia.

This paper aims to examine the nature of the influence of capital structure on the value of corporations from the agro-food sector in Serbia. The panel regression analysis will be used to test the constructed research hypotheses. According to the previous knowledge, prior research in Serbia has mainly focused on the conditionality of the capital structure by different determinants without a special focus on specific economic sectors. Accordingly, it can be said that there have been no papers so far, fully dedicated to the research of the impact of capital structure on the value of corporations that belong to the agro-food sector of Serbia, so this paper would be a kind of filling the evident reference list gap. Also, the references outside of Serbia do not abound with a multitude of papers dedicated to the specifics of the analyzed issues in corporations from the agricultural and/or agri-food sector, which further increases the contribution of this research.

Besides the introduction and conclusion, the paper consists of third parts. The first part of the paper will be dedicated to the previous research. The second part will elaborate the research methodology and describe the sample. The results of the research and discussions will be given in the third part of the paper.

Previous research and hypothesis development

The theoretical debates about the composition of debts and share capital that maximize the value of the corporation, which have been present for decades, still do not stop, which makes the capital structure a constantly current financial phenomenon. Actually, there is still no single position on the optimal limit of corporate debt ratio in the form of a generally valid norm that maximizes the value of a corporation. However, one thing is certain - due to the ever-present degree of risk that the corporation may face financial difficulties, the debt ratio has an objective limit beyond which it is not profitable or it is not possible to further increase the level of debt in the capital structure

Serbia belongs to the group of predominantly agrarian countries, so the agro-food sector is considered one of the most important economic sectors. The agro-food sector has a significant share in employment and gross domestic product, as well as a contribution to reducing the foreign trade deficit (Gajić and Zekić, 2013). Compared to neighboring countries that are members of the EU, Serbia has a high share of the agro-food sector in gross value added and a high share in exports (Strategy of Agriculture and Rural Development of the Republic of Serbia for the period 2014-2024). Consequently, considering the issues of capital structure optimization and its

impact on the values of corporations in this sector can be considered a significant step towards improving the business operations of agro-food corporations and the development of this sector as a whole.

Simonovska, Gjosevski, and Campos (2012) researched the effect of capital structure on financial performance on a sample of companies from the Macedonian agricultural sector. Panel data consisted of 26 Macedonian agricultural companies during the period 2006-2010. The results of the research indicate that Macedonian agricultural companies have an average debt ratio of 0.45 and follow a financial strategy that corresponds to the model of the Pecking order theory. Also, the results of the research indicate that there is no statistical evidence that would confirm the hypothesis that the growth of the debt ratio leads to an increase in financial performance. The authors explain this by the increased risk exposure conditioned by the information asymmetry between the national market, the credit market, and agricultural companies. Mugera and Nyambane (2014) analyzed the impact of debt structure on the financial performance of Broadacre farms in Western Australia using a 10-year unbalanced panel. In conclusion, they point out that the short-term debt ratio has a negative impact on ROA and the long-term debt ratio has no effect on ROA. Buluma, Kung'u, and Gichohi (2017) also concluded that the capital structure has no statistically significant impact on the financial performance of dairy co-operative societies in Nakuru North Sub country, Kenya.

When researching the effect of capital structure on the performance of agricultural and agro-allied companies in Nigeria, Grace, Sunday and Monday Nweke (2018) found out that capital structure has a positive statistically significant impact on returns on investments. Accordingly, they point out that the capital structure is the main determinant of the performance of agricultural and agro-allied companies in Nigeria and they suggest that the financial managers of these companies should have adequate plans before making the capital structure decision to avoid the negative effects of bad financial choices. The positive impact of the long-term debt ratio on the profitability of food and beverage companies in Nigeria over ten years is also confirmed by the results of the Maria and Udeh (2019) survey. Moki Masavi, Kiweu and Kinyili (2017) came to the same conclusion researching the impact of capital structure on the financial performance of agricultural companies listed in the Nairobi securities exchange and indicate that debt ratio growth affects a significant reduction in after-tax profits. The need for managers to have a strategic approach when choosing the capital structure at Food and Beverages Industry in Vietnam, Nguyen et.al. (2020) is pointed out as the conclusion of a survey conducted on a sample of 22 corporations over eight years because they found a positive impact of capital structure on the value of Food and Beverages Industry companies. Siregar, Anggraenl, and Pranowo (2019) indicate that agribusiness companies in the Indonesian stock exchange can maintain an optimal capital structure because the capital structure has a positive impact on the value of companies, which is in line with the Trade-off theory of capital structure.

However, Stekla and Grycova (2016) who observed the relationship between profitability and capital structure of agricultural holdings in the Czech Republic over a period of six years, conclude that the capital structure has a negative impact on profitability. The negative impact of capital structure on the profitability and value of corporations of food and beverage companies, listed in the Indonesia Stock Exchange during 2010-2012, was disclosed by Manurung Suhadak Nila Firdausi Nuzula (2014) in her research. The results of a study by InunJariya (2015), conducted on a sample of listed companies in the Beverage, Food, and Tobacco industry in Sri Lanka, also indicate a negative statistically significant impact of capital structure on company profitability. Sahari, Abdul Rahim and Tinggi (2019) point out that in food-producing firms in Malaysia the capital structure is inversely proportional related to firm performance.

The results of empirical studies are not unique, but they reveal that the choice of capital structure can significantly determine the survival, growth, and development of a corporation; accordingly, the first hypothesis of the research is:

H1: The capital structure has a statistically significant impact on the value of corporations in the agro-food sector

For additional analysis, starting from the position that the capital structure for which the weighted average cost of capital is minimal, unless the cash flows are very small, can provide the maximum value of the corporation and that the nature of the impact of capital structure on the corporation value depends on the profitability of investment projects (McConnell and Servaes, 1995), another hypothesis was developed. Therefore, the fact that the operating profit is a form of results before the payment of interest and taxes is taken into account and that it represents the first condition for achieving tax shield and a positive signal that the corporation will be able to increase its value. Consequently, it can be assumed that the corporation value increases with the growth of debt ratio as long as the corporation achieves a positive operating result, so the second research hypothesis is:

H2: The value of an agro-food corporation with a positive operating result increases with increasing debt ratio.

Data and Methodology

The empirical research was conducted on a sample of all corporations belonging to the agro-food sector and whose shares were traded on the regulated market (Prime listing, Standard listing, Open market) of the Belgrade Stock Exchange in the period from 2011 to 2018. The sample consists of a total of 14 corporations, while the balanced panel makes 112 observations. Testing the second hypothesis implied that observations that characterize operating loss were excluded from consideration. In this case, the

regression analysis included 88 observations that characterize operating profit. Data were collected, primarily, from the websites of the Belgrade Stock Exchange (*www.belex.rs*) and the Serbian Business Register Agency (*www.apr.gov.rs*). The structure of the sample is given in *Table 1*.

Table 1. Sample structure

Characteristics	in %
Sample structure by the size of corporations	
Large	64.29
Medium	35.71
Sample structure by age of corporations	
from 0 to 20	14.29
from 20 to 40	57.14
over 40	28.57

Source: Authors calculations

According to the official criteria and thresholds from Article 6 of the Law on Accounting *("Official Gazette of the RS", No. 62/2013 and No. 30/2018*) for classification of legal entities by size, about two-thirds of the sample are large corporations. When it comes to the ages of corporations, approximately 86% of the sample are corporations with a tradition of more than 20 years. It can be said that the sample is dominated by large mature corporations.

Before testing the hypotheses, correlation analysis, and repeated measures ANOVA analysis were performed. The correlation analysis was performed by estimating Pearson's and Spearman's correlation coefficients. The purpose of repeated measures ANOVA analysis is to take into account any deviations in the values of variables over time when making conclusions. The research is based on the market and book values of corporations at the end of the observed years.

The applied research methodology is based on the methodology used in the empirical studies Simonovska, Gjosevski and Campos (2012) and Grace, Sunday and Monday Nweke (2018). A regression panel was used to test the hypotheses. In addition to the Pooled Ordinary Least Squares Model (Pooled OLS Model), the Fix Effects Model (FE Model) and the Random Effects Model (RE Model) were used to estimate the regression coefficients. To choose between the FE Model and RE Model, the Hausman test was used.

The capital structure is approximated by two variables: long-term debt ratio (LDA) - the ratio of long-term debt to total capital and total debt ratio (DA) - the ratio of total debt and total capital. The natural logarithm of the total assets was used to

approximate the size of the corporation (SIZE). The variables of capital structure and corporation size in the regression model represent independent variables.

The value of a corporation, as a dependent variable, is measured by Tobin's Q ratio (Q), more precisely by the ratio of the total market value of the corporation and the value (cost) of replacing their tangible assets. To take into account the importance of the macroeconomic environment during the research, the inflation rate was defined as a control variable and was taken from the official documents of the Statistical Office of the Republic of Serbia (www.stat.gov.rs).

To test both hypotheses, the following regression model was formed:

$$Q_{it} = \beta_0 + \beta_1 LDA_{it} + \beta_2 DA_{it} + \beta_3 SIZE_{it} + \beta_4 INF_{it} + \varepsilon_{it} \quad (1)$$

The model allows the analysis of the influence of control and independent variables on the value of the corporation, measured by Tobin's Q.

Results and discussion

The results of the descriptive statistical analysis are presented in *Table 2.* The difference in the average value and median long-term debt ratio can be explained by the fact that half of the corporations in the sample do not have long-term debts or have a long-term debt ratio between 1% and 5%. Compared to the average level of the long-term debt ratio of agricultural holdings in the Czech Republic, it can be concluded that the observed corporations in Serbia have a lower level of the long-term debt ratio. Although the median value of the total debt ratio is close to the average value, it can be noticed that some corporations operate almost without borrowed capital, while for some almost all the capital is equal to the borrowed capital. The average level of the total debt ratio of Serbian agro-food corporations corresponds to the average level of the total debt ratio of agricultural and agro-allied companies in Macedonia, Nigeria and the Czech Republic.

Table 2. Results of the descriptive statistical analysis for analyzed corporations from 2011 to 2018

	Mean	Median	Std. Dev.	Minimum	Maximum
LDA	0.1456	0.0524	0.2235	0.0000	0.9323
DA	0.4399	0.4139	0.2633	0.0000	0.9424
Q	0.8419	0.8467	0.4296	0.0381	2.4262
SIZE	15.3665	15.4906	1.1887	12.8604	17.8831
INF	3.9000	2.1000	3.5815	1.5000	12.2000

Source: Authors calculations

The average value of Tobin's Q ratio is 0.84, which means that more must be paid for the purchase of individual assets in the product market than is paid for the entire corporation belonging to the agro-food sector in the financial market. However, based on the minimum and maximum values of Tobin's Q ratio, it can be said that the market value of some corporations is significantly lower than the value of replacing their tangible assets, while in some corporations it is significantly higher and indicates their good growth prospects. Tobin's Q ratio in Serbian agro-food corporations corresponds to Tobin's Q ratio determined on a sample of corporations from Central, Eastern, and Southeastern Europe, which averages 0.824 (Koteski, Josheski and Magdinceva-Sopova, 2015). This similarity is not surprising given the similarity in the socio-political system between Serbia and the observed group of countries, as well as the degree and speed of economic development that characterizes the transition economies to which Serbia belongs. The maximum and minimum value of the SIZE variable indicate significant differences in the size of the total assets with which the observed corporations operate. The inflation rate in the observed period averaged 3.9%, but its value ranged from 1.5% to 12.2%.

Having in mind the results of the correlation analysis given in *Table 3.*, it can be said that the value of the corporation has a statistically significant positive relationship with both variables of capital structure and asset size.

Table 3. Pearson's and Spearman's correlation coefficients for analyzed corporations from 2011 to 2018

	Q	**LDA**	**DA**	**SIZE**	**INF**
Q		0.2957***	0.4652***	0.4987***	-0.0312
LDA	0.1918**		0.4841***	0.3177***	-0.1344
DA	0.3739***	0.6896***		0.6033***	-0.0477
SIZE	0.5284***	0.3382***	0.5802***		-0.0476
INF	-0.0574	-0.0652	-0.0435	-0.0451	

Notes: Pearson's correlation coefficients are below the diagonal. Spearman's correlation coefficients are above the diagonal. Statistically significant at 5% (**) and 1% (***);
Source: Authors calculations

Repeated measures ANOVA analysis was conducted as a supplement to the correlation analysis. The results given in *Table 4.* indicate that the values of the analyzed variables do not differ statistically significantly by years, so the entire observation period can be considered representative of the conducted analysis and making correct conclusions.

Table 4. Repeated measures ANOVA for variables from a sample from 2011 to 2018

	Wilks' lambda	F - value	Partial eta-squared	p - value
LDA	0.784	2.016	0.171	0.225
DA	0.854	1.321	0.158	0.411
Q	0.818	1.794	0.124	0.154
SIZE	0.910	0.763	0.194	0.267

Source: Authors calculations

The results of testing the first hypothesis are given in *Table 5*. Having in mind the results of the Hausman test, the score of the coefficients of the observed variables was conducted using the FE Model. Accordingly, the coefficient score obtained by applying the FE Model includes individual effects specific to each corporation that is constant over time. It can be noticed that the results of the FE Model lead to almost the same conclusions as the results of the Pooled OLS Model, which confirms the robustness of the set regression model. The regression model is valid in both cases, in the Pooled OLS Model; the independent variables used in the model explain approximately 27% of the variability in the value of the corporation, while in the FE Model the explained variability is around 59%. The level of the total debt ratio has a positive statistically significant impact on the value of agri-food corporations. The impact of the long-term debt ratio is also statistically significant, but negative. The size of the corporation also has a positive statistically significant impact on the value of agro-food corporations, while the impact of inflation is not at a statistically significant level.

Table 5. Influence of capital structure on the value of Serbian agro-food corporations from 2011 to 2018

	Q (dependent variable)	
	Pooled Ordinary Least Squares	***Fix Effects Model***
C	-1.8744*** (-3.5700)	4.2341*** (3.1579)
LDA	-0.1258** (-2.2634)	-0.8519*** (-3.5819)
DA	0.2483** (2.0562)	0.4283* (1.9111)
SIZE	0.1684*** (4.6045)	0.2250** (2.5579)

	Q (dependent variable)	
	Pooled Ordinary Least Squares	***Fix Effects Model***
INF	0.0096 (0.9835)	0.0004 (0.0533)
Adjusted R^2	0.2683	0.5940
F	10.9947***	10.3809***

Notes: n=112; Statistically significant at 10% (*), 5% (**) and 1% (***). Hausman test: Chi-Sq Statistic 28.0859 (Prob. 0,000);

Source: Authors calculations

The noticed positive influence of the corporation size on the value of the corporation is in line with the attitude and results of the research of Berger and Bonaccorsi di Patti (2006) who point out that the size of the corporation is an important determinant of the value of the corporation. They also explain that the reason for the positive impact of corporate size on corporate value is that large ones are more diversified than small and medium-sized corporations; they are better managed, have a higher threshold of risk tolerance, and do not have too many difficulties in solving information asymmetry, which in this case can be explained by the fact that the sample is dominated by large and mature corporations from the agro-food sector.

Given that the results indicate that both variables to which the capital structure is approximated have a statistically significant impact on the value of agro-food corporations, it can be said that there is not enough statistically significant evidence to reject the first hypothesis. Actually, it can be said that the choice of capital structure has statistically significant implications for the value of agro-food corporations, indicating the importance of this decision by financial management.

The results of testing the second hypothesis are given in *Table 6*. As in testing the first hypothesis according to the results of the Hausman test, the score of the coefficients of the observed variables was performed using the FE Model. Based on the results of both models, it can be noticed that the robustness of the set regression model was confirmed in this case as well. The regression model is valid in both cases, in the Pooled OLS Model; the independent variables used in the model explain approximately 17% of the variability in the value of corporations, while in the FE Model the explained variability ranges around 64%. The level of debt ratio (long-term and total) has a positive statistically significant impact on the value of the agro-food corporation with operating profit. Also, the size of corporations has a positive statistically significant impact on the value of an agro-food corporation with operating profit, while the impact of inflation is not at a statistically significant level.

Table 6. Influence of capital structure on the value of Serbian agro-food corporations that make positive operating earnings from 2011 to 2018

	Q (dependent variable)	
	Pooled Ordinary Least Squares	***Fix Effects Model***
C	-1.4992** (-2.1829)	1.3691*** (5.3656)
LDA	0.2934** (2.0309)	0.9845*** (3.7978)
DA	0.3589** (2.1212)	0.6197** (2.4114)
SIZE	0.1451*** (3.0976)	0.5500*** (4.8614)
INF	0.0062 (0.5278)	0.0133 (1.5307)
Adjusted R^2	0.1658	0.6373
F	5.2243***	9.7858***

Notes: n=88; Statistically significant at 10% (*), 5% (**) and 1% (***). Hausman test: Chi-Sq Statistic 44.5313 (Prob. 0.000).

Source: Authors calculations

Taking into account that the results indicate that both variables that approximate the capital structure have a positive statistically significant impact on the value of agro-food corporations with the positive operating result, it can be said that there is not enough statistically significant evidence to reject the second hypothesis. It can be said that the increase in the level of the debt ratio of agro-food corporations that achieve an operating profit affects the growth of their value. This can be explained by the fact that an operating profit is the first precondition for interest payment and a signal that the agro-food corporation engages its operating funds and uses borrowed resources in a profitable way. The profitability of an investment project is especially important for the impact of the level of the long-term debt ratio on the value of agro-food corporations because depending on it, the nature of that impact changes. This corresponds to the conclusion of Grace, Sunday, and Monday Nweke (2018) that financial managers of agricultural and agro-allied companies should especially take into account the use of long-term debt here because of its high cost of repayment. The observed characteristic of companies in Serbia speaks in favor of the fact that financial managers should pay special attention to long-term debt, and that is that the increase in the long-term debt ratio is often accompanied by an increase in losses (Ranković, 2011).

McConnell and Servaes (1995) explain the results of their study, which are consistent with the obtained results, by the fact that the level of the debt ratio has a fundamentally

different impact on the value of the corporation depending on the return on investment; respectively profitable investment provides a positive impact of capital structure on the value of the corporation, and vice versa. In the context of the conducted research, and having in mind the numerous limitations that characterize the agricultural development and consequently the food industry in the Western Balkans, and thus in Serbia, which are reflected in low productivity, the use of outdated techniques and technology, low level of investment, low income and lack of alternative types of financing (Stojadinović Jovanović and Dašić 2015), the significance of the obtained results is even greater. Namely, they point out that agro-food corporations in Serbia that can overcome the mentioned limitations in their business can operate profitably and provide a positive effect of capital structure on the value of the corporation, even though in the agriculture and processing industry operating profitability has declined in the last three years of the observed period (Živanović, 2019 and 2018). Accordingly, it can be said that the choice of capital structure in corporations from the agro-food sector in Serbia has a significant impact on the value of corporations, but the profitability of operations significantly determines the nature of this impact.

Conclusions

The choice of the optimal capital structure is one of the essential problems faced by corporate-type companies, which is why the interest in this issue is still not waning. Although the debate over whether there is a level of the debt ratio, in the form of a generally valid norm, which maximizes the value of a corporation, has been going on for decades, there is still no single position on the optimal limit of the corporate debt ratio. However, one thing is certain - due to the ever-present degree of risk that the corporation may face financial difficulties, the level of debt ratio has an objective limit beyond which it is not profitable or it is not possible to further increase the level of debt in the capital structure.

The results of the research indicate that agro-food corporations in Serbia, compared to the results of previous research in this sector, have a lower level of the long-term debt ratio, while the level of total debt ratio corresponds to them. Testing the first hypothesis showed that the capital structure has a statistically significant impact on the value of corporations in the agro-food sector in Serbia, and therefore there is not enough evidence to reject the hypothesis. When testing the second hypothesis, the obtained results indicate that the capital structure has a positive and statistically significant impact on the value of corporations from the agro-food sector in Serbia, which operate with operating profit. Therefore, the second research hypothesis cannot be rejected. Additionally, having in mind the results of the research, it can be said that the capital structure represents a significant determinant of the value of agro-food corporations, so financial managers must have a strategic approach when choosing the capital structure. The profitability of investment projects determines the nature of the impact of the level

of debt ratio on the value of agro-food corporations, which is especially evident in the impact of the level of the long-term debt ratio, which indicates the importance of achieving a positive synergy of financial and investment decisions in agro-food corporations in Serbia.

When it comes to the contribution and significance of this paper, it can be said that the considered issues with a focus on the agro-food sector in Serbia, contribute to filling the gap in the references list. It also draws attention to the importance of the decision to choose the optimal capital structure for agro-food corporations. Apart from that, it provides financial managers of corporations from the agro-food sector in Serbia certain guidelines when making, in the first place financial, but also investment decisions; all of that to create conditions for generating and increasing the value of the corporation. Besides, taking into account the economic importance of the agro-food sector in Serbia and other transition economies, as well as many limiting factors in the development of this sector, the contribution and importance of this paper can be placed in the context of providing guidelines for improving agro-food corporations on the whole.

Despite the mentioned contributions, the conducted research has certain limitations in terms of sample size and structure, research period, an approximation of observed variables, and the applied methodology. Namely, the focus of the research was corporations whose shares were traded on the organized market of the Belgrade Stock Exchange in eight years' time. In the following research, the sample can be extended to companies from the agro-food sector that have a different legal form and the time span can be likewise extended. Also, companies from different countries that belong to the agro-food sector can be included in future research. The market value of the corporation in the research was approximated by Tobin's Q ratio. For future research purposes, accounting indicators can be used to approximate corporation performance, especially if the sample is extended to companies of different legal forms. Regarding the applied methodology, in addition to the panel analysis, the Generalized Method of Moment-GMM or Two-Stage Least Squares-TSLS can be used in future research.

Conflict of interests

The authors declare no conflict of interest

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INFLUENCE OF LIQUIDITY AND SOLVENCY ON PROFITABILITY OF AGROINDUSTRIAL COMPANIES IN THE CONDITIONS OF COVID-19

Miroslav Čavlin[1], Aleksandar Đokić[2], Vesna Miletić[3]

**Corresponding author E-mail: cmiros@gmail.com*

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ABSTRACT

Agroindustry is traditionally an unavoidable category in the analysis of any economy. The objectives of the research are to present a summary of the profit and financial positions of agro industrial companies in the period of COVID-19, and to analyze financial vitality in the context of liquidity of manufacture of food products and beverages, in the year 2020 and 2019, as well as its' average five-year parameters. The findings show that the liquidity indicators are below the desirable norms and overall liquidity assessment is unfavorable. Further analysis by subsectors has revealed differences in profit positions by subsectors, due to different effects of the crisis, so the findings can serve as an incentive to review decisions of all stakeholders, including economic creators' policy.

Introduction

The current COVID-19 pandemic has transcended the borders of nation states and regions. Numerous global and national regulators have adopted a series of measures aimed at preserving human health, but also the financial health of the economy. Preserving the vital financial health of the company denotes the strengthening the ability to maintain a dynamic balance in relation to changing external business factors, and at the same time in relation to internal business factors, which traditionally starts from liquidity as the primary measure of survival - financial position and profit as the primary measure of company growth.

1 Miroslav Čavlin, Full professor,, Faculty of Economics and Engineering Management in Novi Sad, University Business Academy, Cvećarska 2, 21000 Novi Sad, Republic of Serbia, E-mail: cmiros@gmail.com, ORCID ID (https://orcid.org/0000-0001-7465-7441)

2 Aleksandar Djokic, Ph. D, Assistant Professor, University of Pristina, Faculty of Techical Sciense, Knjaza Milosa Street No. 7, 38220 Kosovska Mitrovica, Serbia, Phone. +381649448151, E-mail: aleksandar.djokic@pr.ac.rs, ORCID ID (https://orcid.org/0000-0003-3318-6262)

3 Vesna Miletić, Ph. D., Associate Professor, Faculty of Business and Law Belgrade - Mladenovac, University "MB", Belgrade, Serbia, E-mail: vmiletic68@gmail.com, ORCID ID (https://orcid.org/0000-0003-1287-5800)

As agroindustry is an unavoidable activity in the development of the economy, the subject of the paper analyzes the short-term impact of the COVID-19 pandemic on the liquidity and solvency of agro-industrial enterprises in the Republic of Serbia. The global agro-industry has a share of 10% in the total world GDP, and more specifically, about six billion dollars is the value of sales in the food industry in the world. It is normal that there are regional differences in the average structural positioning of agro-industry, which are conditioned by the overall level of economic development of individual regions and, naturally, given resources in certain territories. In the developed regions, the share of agro-industry does not exceed 10%, and is lower than the percentage in developing countries (13%). This relationship should not be viewed only from the side of the development of agro-industry in individual countries, but also as an actual development of other industries in those countries. Agribusiness companies from developed countries generate over 60% of total operating revenues and 60% of value added, and employ almost 50% of the total employees in the EU food industry (Eurostat, https://ec.europa.eu/eurostat) Agriculture is an economic branch with a long tradition and great importance for the whole economy, and in GDP of Serbia its share ranges 3.7% to 4.3%, and together with agricultural production this sector participates in the formation of GDP from 10% to 13% in depending on the observed year. In the structure of GDP, the share of food production varies from 3.0% to 3.5%. The share of beverage production ranges between 0.7% and 0.9%. The agro-industry is labor-intensive and employs over 70,000 employees and exports from over EUR 1.5 billion, which represents about 12% of the total exports of the Republic of Serbia. It should be noted that in the group of 100 largest companies in Serbia in terms of operating income and net profit in recent years at least 10% of companies are from the agro-industry (Chamber of Commerce of Serbia, https://pks.rs/).

Therefore objectives of the paper are to provide a summary of the profit and financial position of agro-industrial companies in the period prior to COVID-19 and in times of COVID-19, to clarify the importance of liquidity within the financial position of the companies, by subsectors of food and beverage manufacture, through selected indicators for 2020 compared to the previous year, and a five-year average in the period of 2015-2019. In the next section an overview of the literature is presented. The research method, results and discussion follows the overview of the literature and the last section contains concluding remarks.

Literature review

Strong public support and macro prudential policies have helped maintain stability in Covid 19 pandemic (Echarte Fernández, Náñez Alonso, Jorge-Vázquez, Reier Forradellas, 2021; Vapa Tankosić, Čavlin, Budjevac, 2020; Čavlin, Vapa Tankosić, Egić, 2021; Cipek & Ljutić, 2021). In the Eurozone there is a risk of increased commercial defence , and the risk of permanent adverse results on worlwide supply chains (Welfens, 2020). The countries most affected by the crisis are those that largely depend on tourism, traffic and other economic activities (Marjanović, Đukić, 2020).

The current financial situation and volatility requires the preservation of the role of "last resort" that support transactions that commercial banks cannot support on their own (Kiss, Tanács, Lippai-Makra, Rácz, 2020; Vapa Tankosić, Vukosavljević, 2021). The IMF analysis of central bank measures and instruments for the effects of Covid 19 pandemic stresses monetary, external, and financial policies for banks and borrowers (IMF, 2020). Monetary policy measures of central banks have been specifically designed to control the quantity of money. Central banks have reduced interest rates (by 50-150 basis points) to stimulate economic activity and reduce the cost of borrowing funds and have supported the liquidity by lowering the mandatory's reserves for banks, softening the terms for collateral, increasing the repo operations to obtain liquidity, and extending the period of such operations, or through a program to provide additional financial support to banks (European Central Bank). Some of the above measures of monetary policy are also adopted by the National Bank of Serbia (NBS). The National Bank of Serbia provided banks with additional 41.1 billion dinars of dinar liquidity and 96.0 million euros of foreign currency liquidity through monetary policy instruments (National Bank of Serbia, www.nbs.co.rs). The ECB and the NBS have reached an agreement to establish a repo line to provide liquidity in euros to Serbian financial institutions should such a need arise in the face of market disruptions caused by the Covid-19 pandemic. Through this repo line, the ECB has provided liquidity in euros to the non-euro central banks in exchange for appropriate collateral in euros. Swap arrangements by central banks, such as arrangements between the American FED and foreign central banks have improved the visibility of the dollar (Aizenman. Ito, Pasricha, 2020; Đorđević et al., 2021). Quantitative easing has increased the money supply and help reduced long-term interest rates as well as the purchase of large amounts of securities, such as government bonds (Central Bank of Japan, European Central Bank).

Several countries have lowered their mandatory foreign exchange reserves (Central bank Indonesia and Turkey) or in-creased the availability of foreign exchange swaps and repo transactions (Central banks of Brazil, Indonesia, Mexico and Russia). Recommendation to use capital and liquidity-absorbing Basel III liquidity, easing specific regulatory requirements, postponing stress tests, limiting the payment of bank dividends, monitoring credit risk status (Yusdika, Purwanti, 2021; Alao, Gbolagade, 2020) have been adopted. Financial policies for borrowers have provided the companies with access to additional capital in the form of state-supported loans or credit guarantees encompassing lower interest rates, moratoriums on principal or interest for up to one year, loans to support the financing of companies with a grace period of two years, coverage of loans with government guarantees (Anderson, Drabancz, Grosz, 2021; Martin, 2020).

The understanding and conceptual definition of a company's liquidity is expressed by a general realtion: short-term assets/short-term liabilities. In the economic literature, there is a plethora of research on the liquidity, Rodić (2003), Malešević (2014), Stevanović et al. (2011) Mikerević et al. (2015) Tintor (2009), Belak (2014) and Žager et al. (2017). The essence is that the starting point for the liquidity analysis is the ratio

of short-term assets/short-term liabilities, which is understood as a general indicator of liquidity. Liquidity analysis is based on the following assumptions (Malešević, Čavlin, 2020) presented in Table 1.

Table 1. Overview of static and dynamic liquidity ratios

Static liquidity indicators	
Effective liquidity ratio	cash + cash short-term equivalents + short-term receivables/short-term liabilities
Current liquidity ratio	(cash + short-term securities)/short-term liabilities
Perspective liquidity ratio	Total current assets/current liabilities
Dynamic liquidity indicators - "cash flow"	
Ratio of coverage of short-term liabilities by cash flow from operations	cash flow from operating activities/average short-term liabilities
Ratio of defensive interval of liquid assets	(current assets - inventories)/average daily cash from operating activities
Cash in hand ratio	Cash and current liquid securities/average daily cash outflows for operating expenses
Ratio of average cash cycle duration	average period of inventory duration + average period of trade receivables - average payment period of suppliers
Ratio of average payout time of suppliers	suppliers x 365/annual procurement
Ratio of average inventory life	inventory x 365/sale
Ratio of average duration of receivables	receivables x 365/sales
Static and dynamic solvency	
Ratio of dynamic solvency-interest coverage	Operating profit/Interest expenses (by third parties)
Indebtedness ratio	(Total liabilities-Capital)/Total assets

Source: Authors' elaboration

Materials and methods

Since different approaches in the classification and definition of agro-industrial activities are present the authors have decided on the most typical classification which includes two areas of sector C – Manufacturing, namely: 10 - Manufacture of food products and 11 - Manufacture of beverages, defined in the national system of classification of activities stipulated by the Decree on Classification of Activities, which taken from the European standard classification of activities in the Regulation (EC) No 1893/2006. The research includes the analysis of key parameters of company liquidity in the Republic of Serbia for the period from 2019 to 2020 and the period of 2015-2019 for Sector C Manufacturing and its subsectors. For the needs of the research, a representative of companies was formed, according to the statistics of the Republic Statistical Office of Serbia and from publicly available information, i.e. official financial reports, which the companies have submitted to the Business Registers Agency of the Republic of Serbia, and from direct insight into the company's reports. The sample has included the data for 47000 companies from the sector with the majority of micro companies prevailing in the sample (84,38%). The sample size has proven to be satisfactory. The paper has the following research objectives:

1. a descriptive analysis of the profit and liquidity position based on the ratio analysis of liquidity, solvency and profitability of the sector C Manufacturing and its subsectors 10 - Manufacture of food products; 11 -Manufacture of beverages;

2. an empirical analysis of the impact of liquidity and solvency on Return on Assets (ROA) before and after COVID-19, based on traditional ratios, of the sector C Manufacturing and all its subsectors. The second research objective has been analyzed by a regression analysis of the profit and financial position of manufacturing activity (Sector C) in the period prior to COVID-19 and in times of COVID-19. The regression analysis has been using variables of current profit positions and liquidity indicators of the sector C - Manufacturing and subsectors: 10 - Manufacture of food products; 11 -Manufacture of beverages; 12 - Manufacture of tobacco products; 13 - Manufacture of textiles; 14 - Manufacture of wearing apparel; 15 - Manufacture of leather and leather products; 16 -Processing of wood and articles of wood, cork, straw and plaiting materials, except furniture; 17 - Manufacture of paper and paper products; 18 - Printing and reproduction of audio and video recordings; 19 - Manufacture of coke and refined petroleum products; 20 - Manufacture of chemicals and chemical products; 21-Manufacture of basic pharmaceutical products and preparations; 22 - Manufacture of rubber and plastic products; 23 - Manufacture of other non-metallic mineral products; 24 - Manufacture of basic metals; 25 - Manufacture of fabricated metal products, except machinery and equipment; 26 - Manufacture of computers, electronic and optical products; 27 -Manufacture of electrical equipment; 28 - Manufacture of other machinery and equipment nec; 29- Manufacture of motor vehicles, trailers and semi-trailers; 30-Manufacture of other transport equipment; 31 - Manufacture of furniture; 32 - Other manufacturing and 33 - Repair and installation of machinery and equipment.

Results and discussion

By analyzing the results obtained from Table 2 of the profit and liquidity position based on the ratio analysis of liquidity, solvency and profitability of the sector C Manufacturing and its subsectors 10 - Manufacture of food products and 11 -Manufacture of beverages, it is possible to highlight the following:

- that at the sector level, the trend of declining revenues in 2020-2019 by 15% has been accompanied by a marked increase in operating and net profit, but also a marked increase in operating and net losses, and especially unfavorable profit position when comparing the trends with the average growth rate of operating and net profit or loss for 2015- 2019.

- that the sector has a tendency to decrease revenues which has been accompanied by a lower decrease in operating and net profits compared to the decrease in operating and net losses, which implies a decrease in profitability indicators.

- that the sub-sectors have also registered a decline in operating revenues in 2020 compared to 2019, with sub-sector “10” declining at the sector level and sub-sector “11” declining by ¼;

- that in the subsector "10" the income decline trend has been accompanied by an increase in operating profit and a decrease in operating losses, while there was a decrease in net profit and an increase in net losses, which resulted in no decrease in profitability of assets but capital;

- that in subsector "11" the income decline trend has been accompanied by a smaller decrease in operating profit compared to operating loss, while there was an increase in net profit and a decrease in net losses, which resulted in no increase in asset profitability, and a slight decrease in profitability capital.

We can summarize that the profit position in the subsector as well as at the level of Sector C is unfavorable, especially when considering the trends in relation to the analyzed five-year period.

Table 2. Dynamics of operating income, operating and net profit/loss for the Sector C and subsectors 10 and 11 in the Republic of Serbia for 2019-2020 and 2015-2019

Categories	Operating income	Operating profit	Operating loss	Net income	Net loss	ROA	ROE
Sector C - 2019	3.176.463.973,00	222.013.336,00	46.182.018,00	189.749.010,00	65.599.443,00	0.06	0.12
Sector C - 2020	2.712.613.597,00	216.312.527,00	38.188.165,00	176.604.989,00	54.120.227,00	0.05	0.11
Rate +/- 2019/2020	-0.15	-0.03	-0.17	-0.07	-0.17	-0.04	-0.07
Average rate 2015 /2019	0.07	0.06	-0.03	0.09	-0.18	0.07	0.23
Subsector 10 - 2019	753.876.674,00	45.651.748,00	8.770.284,00	37.331.631,00	12.761.155,00	0.05	0.12
Subsector 10 -2020	643.194.870,00	47.785.645,00	5.509.040,00	35.957.215,00	14.320.017,00	0.05	0.11
Rate +/- 2019/2020	-0.15	0.05	-0.37	-0.04	0.12	0.01	-0.06
Average rate 2015 /2019	0.04	0.03	0.07	0.07	-0.19	0.05	0.11
Subsector 11 - 2019	115.765.340,00	11.731.406,00	1.770.091,00	10.191.143,00	3.552.960,00	0.05	0.09
Subsector 11 - 2020	86.798.058,00	9.716.870,00	984.901,00	11.009.626,00	1.593.751,00	0.06	0.08
Rate +/- 2019/2020	-0.25	-0.17	-0.44	0.08	-0.55	0.04	-0.03
Average rate 2015 /2019	0.02	0.07	0.09	0.13	-0.04	0.05	0.09

Source: Authors' calculations

By analyzing the results obtained from Table 3, of the liquidity and solvency indicators of the sector C Manufacturing and its subsectors 10 - Manufacture of food products and 11 -Manufacture of beverages it is possible to highlight the following:

- the average values of the company's liquidity ratio at the level of Sector C are far from desirable theoretical norms, which implies a threat to liquidity conditions.

- average values of the general liquidity ratio of companies in the analyzed subsectors show that they are below the preferred analytical standard (≥2).

- average values of the quick liquidity ratio of companies in the subsector "10" and "11", show that they are lower than the desired theoretical norm (≥1).

- average values of the current liquidity ratio of companies in the context of the given values of general and accelerated liquidity ratios imply that companies do not have sufficiently liquid assets to settle short-term liabilities.

- further development of the analysis, we supplement the findings on the dynamic liquidity indicators for more complete conclusions on the liquidity of the analyzed subsectors, and it is possible to note that there was a shortening of the cash cycle in the subsector "10". The shortening of the cash cycle period was mainly influenced by the extension of the payout period of suppliers;

- the extension of the cash cycle period in the subsectors in subsector "11" was mostly influenced by the extension of the period of inventories;

- the value of indebtedness indicators tends to decrease in 2020 compared to 2019, while the subsector "10" has a value higher than the desired norm, which indicates the predominance of own financing in relation to foreign sources and acquiring conditions for a favorable assessment of the debt position.

Table 3. Overview of liquidity and solvency indicators for the sector C and subsectors 10 and 11 in the Republic of Serbia for 2019-2020 and 2015-2019

Categories	Sector C - 2019	Sector C-2020	Rate +/- 2019/2020	Average rate 2015/2019	Subsector 10 –2019	Subsector 10 –2020	Rate +/- 2019/2020	Average rate 2015/2019	Subsector 11-2019	Subsector 11-2020	Rate +/- 2019/2020	Average rate 2015/2019
Current liquidity ratio	1.05	1.1	0.05	0.93	1.14	1.16	0.02	1.05	0.91	0.85	-0.06	0.76
Cash liquidity ratio	0.12	0.15	0.24	0.10	0.12	0.15	0.24	0.09	0.16	0.17	0.09	0.09
Quick liquidity ratio	0.64	0.67	0.05	0.57	0.68	0.69	0.01	0.64	0.61	0.55	-0.10	0.51

Categories	Sector C - 2019	Sector C-2020	Rate +/- 2019/2020	Average rate 2015/2019	Subsector 10 –2019	Subsector 10 –2020	Rate +/- 2019/2020	Average rate 2015/2019	Subsector 11-2019	Subsector 11-2020	Rate +/- 2019/2020	Average rate 2015/2019
Average "cash cycle" period (in days)	67.98	75.61	0.11	70.35	88.13	86.00	-0.02	87.62	43.89	54.08	0.23	21.37
Average time of collection of receivables (in days)	67.98	75.61	0.11	70.35	65.14	69.72	0.07	71.08	67.70	77.99	0.15	70.95
Average payment time to suppliers (in days)	111.56	123.40	0.11	117.47	84.99	92.35	0.09	90.85	163.39	196.01	0.20	164.22
Stock turnover time (in days)	122.10	131.16	0.07	118.83	107.98	108.63	0.01	107.40	139.58	172.10	0.23	114.64
Solvency (dynamic indicator)	12.62	17.55	0.39	8.36	7.16	12.57	0.76	6.48	13.48	13.82	0.03	12.27
Indebtedness	0.53	0.51	-0.03	0.57	0.58	0.55	-0.05	0.59	0.32	0.31	-0.05	0.42

Source: Authors' calculations

The analysis by sub-sectors of the agro-industry highlights noticeable differences in the analysis of the profit and financial position, which indicates the need to develop a deeper analysis in terms of the impact of liquidity on profitability done by linear regression (Rosner, 2011; Radović Marković, Hanić, 2018).

a) Linear regression- Impact on ROA before Covid-19

Independent variables in the regression are: Current liquidity ratio, Cash liquidity ratio, Quick liquidity ratio, Solvency (dynamic ratio) and Debt ratio. The dependent variable is Return on Assets (ROA).

Table 4. Model evaluation

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,626[a]	,392	,366	,02433

Source: Authors' calculations

In the Table 4, a value of 0.62 represents a good level of prediction and 39.2% of the variability of the dependent variable can be explained by the independent variables.

Table 5. Regression model test

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,045	5	,009	15,333	,000
	Residual	,070	119	,001		
	Total	,116	124			

Source: Authors' calculations

F-value in the Table 5, shows that our regression model is good F = 15.333, p <0.05. From the Table 6 for the period 2016-2019 quick liquidity ratio (β= ,048, p= ,044), dynamic solvency (β= ,000, Sig.= ,003) and debt ratio (β= -,109, Sig.= ,001) have provided statistically significant predictions of the variable „Return on assets before Covid-19".

Table 6. Estimates of model coefficients

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,089	,026		3,463	,001
	Current liquidity ratio	,008	,018	,070	,433	,666
	Cash liquidity ratio	-,084	,058	-,147	-1,452	,149
	Quick liquidity ratio	,048	,024	,308	2,034	,044
	Solvency (dynamic ratio)	,000	,000	,241	3,002	,003
	Debt ratio	-,109	,032	-,315	-3,359	,001

Source: Authors' calculations

a) Linear regression- Impact on ROA in times of Covid-19

In the Table 7, "R" a value of 0.83 represents a good level of prediction and 69.9% of the variability of the dependent variable can be explained by the independent variables.

Table 7. Model evaluation

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,836[a]	,699	,616	,01888

Source: Authors' calculations

F-value, in the Table 8, shows that the independent variables statistically predict the dependent variable well (Sig. = .000) and our regression model is good F =8.369, p <0.05.

Table 8. Regression model test

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,015	5	,003	8,369	,000
	Residual	,006	18	,000		
	Total	,021	23			

Source: Authors' calculations

From the Table 9 in times of Covid-19 the variable solvency (β= ,001, Sig.= ,020) and debt ratio (β= -,131, Sig.= ,010) are statistically significant predictions of the variable "Return on assets in times Covid-19".

Table 9. Estimates of model coefficients

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,098	,036		2,769	,013
	Current liquidity ratio	-,034	,026	-,444	-1,276	,218
	Cash liquidity ratio	,011	,088	,024	,130	,898
	Quick liquidity ratio	,060	,040	,505	1,500	,151
	Solvency (dynamic ratio)	,001	,000	,472	2,541	,020
	Debt ratio	-,131	,046	-,469	-2,857	,010

Source: Authors' calculations

Conclusions

Financial vitality in the context of liquidity is the ability to provide sustainable liquidity in crisis business conditions that will not endanger the survival of the company. This research has analyzed the financial vitality in the context of the liquidity of agro industrial companies in the Republic of Serbia on the basis of balance sheet data, and in the period and business conditions affected by the COVID-19 pandemic. The findings summarize that in the short run, the otherwise fragile financial vitality in the context of liquidity has deteriorated to a in the manufacture of food products and beverages. Further analysis revealed differences in the profit and financial position of the sub-

sectors, which show that the impact of the pandemic did not affect all sub-sectors equally. The recent analysis of the meat processing activity in the Republic of Serbia shows a positive impact of the solvency ratio on the ROA which is in line with the findings of this paper (Čavlin, Vapa Tankosić, Miletić, Ivaniš, 2021). The COVID-19 pandemic is a completely new type of crisis, and it is not possible to expect that the problems that have affected the economy and society as a whole will be known and solved in a short period of time. In that sense, it is necessary to continue the research by analyzing the impact on subsectors, branches and groups of activities, and the interdependence of profit and financial position categories, taking into account a number of other economic determinants, primarily the character and typology of companies. It is certain that the analysis of the impact of the COVID-19 pandemic will be the subject of research attention and that the research in question represents the beginning, and in that sense, the limitation of the research can be pointed out.

Conflict of interests

The authors declare no conflict of interest.

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UNDERSTANDING THE YOUTH TOURISTS' MOTIVATION TO ATTEND RURAL GASTRONOMIC FESTIVALS IN THE REPUBLIC OF SERBIA

Marijana Seočanac[1]

**Corresponding author E-mail: marijanaseocanac@gmail.com*

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ABSTRACT

This study aims to examine the motivation of young tourists to attend gastronomic festivals in rural areas in the Republic of Serbia. In addition, it seeks to find out whether their motivation differs depending on their knowledge of and interest in gastronomy. The research was conducted on a sample of 125 respondents. The collected data was analyzed through the Statistical Package for Social Sciences (SPSS 20), using descriptive statistics, the K-means clustering multivariate grouping technique, and nonparametric statistical procedures (Kruskal-Wallis H test and Mann-Whitney U test). The results have shown that the opportunity to try new and varied foods, as well as enjoying the atmosphere at the festival, are the main motives for young tourists to attend gastronomic festivals in rural areas in the Republic of Serbia. Additionally, it was discovered that the gastronomic motifs of young tourists are different and conditioned by their knowledge of and interest in gastronomy.

Introduction

In modern society, gastronomy is becoming increasingly important. Some authors even perceive gastronomy as a manifestation of the culture of one place (Pavlidis & Markantonatou, 2020). Such power that food has led to it becoming a tourism resource (Dancausa Millán et al., 2021), whose role is to promote and differentiate a tourism destination (Dixit, 2021). Numerous terms have been coined in the literature to explain the role of food in tourism, such as "food tourism" (Hall et al., 2003), "culinary tourism" (Henderson, 2009), "tasting tourism" (Boniface, 2003). One of the most widely accepted is the term "gastronomic tourism" which implies "visitation to primary and secondary food producers, food festivals, restaurants, and specific locations for which food tasting and/or experiencing the attributes of a specialist food production region are the primary

1 Marijana Seočanac, Research Assistant, University of Kragujevac, Faculty of Hotel Management and Tourism in Vrnjačka Banja, Vojvođanska 5a, 36210 Vrnjačka Banja, Serbia, Phone: +381365150024, E-mail: marijanaseocanac@gmail.com, ORCID ID (https://orcid.org/0000-0001-7232-3624)

motivating factor for travel" (Hall & Sharples, 2003, p. 10). Owing to the significant economic contribution it can provide, gastronomic tourism is considered particularly important for developing countries (Mgonje et al., 2017).

Although the true scale of gastronomic tourism in the Republic of Serbia is difficult to comprehend due to a lack of adequate statistics (Dimitrovski, 2016; Šapić et al., 2018), Stanišić et al. (2018) found that gastronomy is a significant tourism offer in the Republic of Serbia. Their research revealed that in 2017, a total of 241 gastronomic festivals were held. Gagić et al. (2013) also note that "a strong connection between tourism and gastronomy in the Republic of Serbia was...established through food and drink festivals" (p. 1056). Gastronomic festivals, as one of the forms of food festivals, promote local food, increase the number of tourists in the destinations where they are held, and provide an opportunity for tourists to connect with local culture and people (Viljoen et al., 2017). So, in addition to being a good way to promote the host region, gastronomic festivals are also a great opportunity for tourists to gain new experiences, enrich their knowledge, and enjoy local cuisine (Wu et al., 2014; Carvache-Franco et al., 2020). However, Robinson and Getz (2014) note that in the literature on gastronomic festivals, special attention is paid to supply, while demand is largely neglected.

Kumar (2019) points out that "local food is an important tourist attraction and central to the tourist experience, not only for those who have special interest in food but also for those who have a more casual attitude to food and eating" (p. 1). However, Pavlidis and Markantonatou (2020) note that the preferences of tourists differ significantly depending on their interest in gastronomy. Pérez-Priego et al. (2019) believe that for successful tourism management, classification of tourists based on their interest in gastronomy is needed. Björk and Kauppinen-Räisänen (2016) proposed a classification of tourists based on their attitude towards gastronomy. These authors found that there are three types of tourists. First, there are "experiencers" or tourists who are extremely interested in gastronomy and for whom gastronomy is crucial when choosing a destination. Then, there are the "enjoyers" or tourists who have a positive attitude towards gastronomy. For this type of tourists, gastronomy is important for the destination choice and pleasure, but not as important as for experiencers. Finally, there are the "survivors" or the segment that has the lowest interest in gastronomy. Kim et al. (2010) point out that the motivation of food tourists has become one of the most prominent research topics in the tourism literature. However, Su et al. (2020) think that current literature lacks an understanding of the motivation of different gastronomic segments of tourists, so further research is needed.

The aim of this paper is three-fold. First, the paper aims to examine the motivation of young tourists to attend gastronomic festivals in rural areas in Serbia. According to the United Nations World Tourism Organization and the World Youth Student and Educational Travel Confederation (2008), young tourists are an extremely important industry. Compared to other market segments, it is characterized by high spending power, significant tourist flow (accounting for over 20% of international tourist arrivals), low impact of pandemics, terrorism, or natural disasters on travel decisions,

desire to meet local people, explore new destinations, and get off the beaten track. Most of the research on gastronomic festivals so far has been conducted on a sample of older respondents, while young tourists were mostly neglected. However, a study by Dimitrovski et al. (2021), conducted in the context of slow food festivals, discovered that young tourists are also interested in gastronomic festivals and that their motivation differs significantly from the motivation of older tourists. The taste, experience, social status, change, people, family, and inspiration dimensions, which were discovered by Park et al. (2008) as the most important motives for visiting gastronomic festivals, will be used in this study to gain knowledge about the primary motives of young tourists to visit rural gastronomic festivals in the Republic of Serbia. Another aim of the paper is to cluster young gastronomic festival attendees based on the criteria that Björk and Kauppinen-Räisänen (2016) proposed. Finally, the aim is to investigate whether there is a difference in the motivation of young tourists to attend gastronomic festivals depending on which gastronomic cluster they belong to.

The current study provides insights on the motivation of young tourists to attend gastronomic festivals and adds to the current knowledge on motivation in tourism. The use of segmentation models in gastronomic tourism on the example of gastronomic festivals in the Republic of Serbia, which has not been the subject of research so far, is another contribution of this study. By providing knowledge about the motives of young tourists to the organizers of gastronomic festivals, which they can use to better organize future events, thus, the study will have practical implications as well.

Materials and methods

The target population for this study was millennial tourists who visited rural gastronomic festivals in the Republic of Serbia. The empirical research was carried out among students of the Faculty of Hotel Management and Tourism in Vrnjačka Banja, in the period from July to September 2021. The appropriate sample was considered adequate because the students correspond to the observed age group and come from different parts of the Republic of Serbia, which indicates the probability that the sample will consist of respondents who visited gastronomic festivals in various rural areas across the country. In this way, it was possible to obtain the appropriate sample in a relatively short time and with no research costs. Additionally, having in mind that Gastronomic Management is one of the study programs at the Faculty, it is expected that the segmentation of respondents based on their knowledge of and interest in gastronomy, necessary for the realization of the second research goal, will be facilitated.

The research was conducted online due to COVID-19 restrictions imposed in March 2019. A questionnaire consisting of three sections and 37 questions was prepared using Google Forms survey administration software. The first section contained questions about respondents' demographic characteristics; the second assessed their knowledge and interest in gastronomy; and the third section included questions about their motivation to attend rural gastronomic festivals, which were compiled based on relevant claims in the literature (Park et al., 2008). Respondents expressed their agreement with

the offered statements using the five-point Likert scale (1 – completely disagree, 5 – completely agree). The questionnaire was sent to students in July 2021, via email addresses obtained from the Faculty Student Services. Of the 400 surveys forwarded, 125 responses were recorded, giving a response rate of 31%. Since all questions in the survey were mandatory, there was no missing data.

The collected data was analyzed in the Statistical Package for Social Sciences (SPSS 20). The adequacy of the sample was estimated based on the answers to the questions related to age and the rural gastronomic festivals visited. The average value was calculated for each statement related to the motivation of tourists to attend rural gastronomic festivals. The internal consistency of each scale used in the research was examined with the help of Cronbach's alpha coefficient.

In order to segment the respondents based on their gastronomic preferences, the K-means clustering multivariate grouping technique was used. The number of clusters was determined based on the suggestions of Björk and Kauppinen-Räisänen (2016), and the basis for segmentation was the respondent's level of knowledge of and interest in gastronomy. A discriminatory analysis was used to confirm the correct grouping. The Kruskal-Wallis H test was used to detect significant differences between the observed groups, while the Mann-Whitney U test was used to detect between which groups a statistically significant difference in mean values exist. Descriptive statistics, i.e., frequency analysis, were used to represent the respondents who belong to each identified group. A nonparametric statistical procedure, the Kruskal-Wallis H test and the Mann-Whitney U test, was used to examine potential differences in motivational factors among the identified groups of tourists.

Results and Discussion

In order to assess the adequacy of the obtained sample, the results related to the respondents' age and the rural gastronomic festivals they have visited so far were first analyzed. All respondents correspond to the demographic cohort that is the subject of the study. Answers to the question "*Which rural gastronomic festivals in the Republic of Serbia have you visited so far?*" showed that the largest percentage of respondents visited the Cabbage Festival in Mrčajevci (40.8%), followed by the Smoked Meat Festival in Mačkat (27.2%), the Bacon Festival in Kačarevo (8.8%), the Srem Kulen Festival in Erdevik (7.2%), and the Sausage Festival in Turija (4.8%). These results showed that the sample consists of respondents who visited rural gastronomic festivals in different parts of Serbia, which is why the obtained sample is adequate for the realization of defined goals.

The motivation of young tourists to attend rural gastronomic festivals was examined with the help of seven dimensions proposed by Park et al. (2008). The calculated Cronbach's alpha coefficient for each scale is over 0.8, which, according to the authors Bagozzi and Yi (1988) and DeVellis (2012), indicates a high level of internal consistency of the scales. Based on the obtained results (*Table 1*), it was discovered

that the taste dimension, and especially the elements "the opportunity to try new foods" and "the opportunity to try various foods", are the most important motives for young tourists to attend rural gastronomic festivals. These results agree with the results of Krajíčková and Šauer (2018), who found that for visitors of gastronomic festivals, the opportunity to try new food, rather than a favorite dish, is the main motive for visiting this type of festival. After the taste dimension, the most important motive for the respondents was experience. For young tourists, as expected, the opportunity to "enjoy the atmosphere at the festival" and "have fun" are extremely important reasons why they visit gastronomic festivals. Dimitrovski et al. (2021) identified that the quality of food and the program content of the event are the main drivers of satisfaction for young tourists who attend slow food festivals. On the other hand, social status and, above all, "gaining popularity among friends and family" are the least important motives for attending rural gastronomic festivals. These results are in contrast to the study by Krajíčková and Šauer (2018), conducted during two events in the Czech Republic, which found that social status is an important component of students' motivation to attend gastronomic festivals.

Table 1. Dimensions of motivation for attending rural gastronomic festivals

Dimensions			Mean	Ranking
Taste	Cronbach's alpha (0.847); Mean (4.34)	Consumption of a favorite dish	4.22	7
		Opportunity to try new food	4.51	1
		Opportunity to try a variety of foods	4.43	2
		Opportunity to find food for future consumption	4.21	8
Experience	Cronbach's alpha (0.837); Mean (4.28)	To satisfy curiosity	4.06	13
		To have fun	4.36	4
		To enjoy the atmosphere at the festival	4.40	3
		To enjoy the environment / location where the festival takes place	4.30	5
Social status	Cronbach's alpha (0.828); Mean (2.72)	That my friends think I went to an exciting event	2.12	27
		To gain popularity among friends and family	1.82	28
		To visit an event I can tell others about when I get home	3.18	24
		To share my knowledge of the festival with others	3.75	20
Change	Cronbach's alpha (0.894); Mean (4.01)	To escape from the daily routine	3.95	15
		To relax	4.02	14
		To get rid of boredom	3.86	16
		To enjoy the day outside	4.20	9

Dimensions			Mean	Ranking
People	Cronbach's alpha (0.864); Mean (3.61)	To observe the people around me	3.17	25
		To meet new people	3.85	17
		To meet people who have the same interests as me	3.82	19
		To make new business contacts	3.59	21
Family	Cronbach's alpha (0.877); Mean (3.92)	To spend time with family / friends	4.19	10
		To be in a new environment with family / partner / friends	4.25	6
		To help my family learn more about gastronomy	3.38	23
		To help my family enjoy the festival	3.84	18
Inspiration	Cronbach's alpha (0.892); Mean (3.76)	To exchange ideas with professionals	3.52	22
		To meet a famous chef	3.16	26
		To expand my knowledge of gastronomy	4.10	12
		To develop my cooking skills	3.85	17
		To get new ideas / recipes	4.17	11

Source: Authors' calculations

In order to examine whether there is a difference in the motivation of the respondents depending on their knowledge of and interest in gastronomy, first, the respondents were divided into clusters. Clusters identified based on respondents' knowledge of and interest in gastronomy were named according to Björk and Kauppinen-Räisänen's (2016) suggestion as "survivors", "enjoyers" and "experiencers". The first segment, or survivors, consisted of 15.2% of respondents and included respondents with the lowest ratings of knowledge and interest in gastronomy. The largest segment (53.6%) consists of enjoyers, or respondents who showed moderate knowledge and interest in gastronomy, while those who have the greatest knowledge and interest in gastronomy, or experiencers, make up 31.2% of the sample. Discriminant analysis, which revealed that 96.8% of respondents were correctly classified, confirmed the validity of the performed segmentation. Based on the results of the Kolmogorov-Smirnov test for examining the normality of the distribution, the normality of the sample distribution has not been proven. For this reason, nonparametric tests were used to examine differences in knowledge and interest in gastronomy between clusters. The Kruskal-Wallis H test showed that the mean values differed significantly among the observed groups, while the Mann-Whitney U test with Bonferroni correction of alpha value found that there was a statistically significant difference ($p < 0.017$) between each identified gastronomic cluster (*Table 2*). These results show that young tourists who attend rural gastronomic festivals differ according to their level of knowledge of and interest in gastronomy.

Table 2. Characteristics of identified clusters

Gastronomic inclination	Clusters			Kruskal-Wallis H	
	Survivors	Enjoyers	Experiencers	x^2	Sig.
How would you rate your knowledge of gastronomy?	1.74	2.73	4.38	90.491	0.000
How would you rate your interest in gastronomy?	1.89	3.69	4.67	71.366	0.000

Source: Authors' calculations

The socio-demographic profile of the respondents belonging to each cluster is shown in *Table 3*. The sample consists mostly of female respondents (81.6%), and the gender ratio is very similar in all three clusters. The Kruskal-Wallis H test did not identify statistically significant differences in the sociodemographic characteristics of the respondents among the clusters. The results showed that the largest percentage of respondents (52%) visit rural gastronomic festivals once a year. Among the observed clusters, a statistically significant difference in terms of the intensity of rural festival attendance was found (Kruskal-Wallis H = 21.008, p = 0.000). The analysis showed a higher frequency of respondents who visit rural gastronomic festivals more than three times a year in a group characterized by greater knowledge of and interest in gastronomy. In the cluster consisting of respondents who showed the lowest knowledge of and interest in gastronomy, 84.2% of respondents visit gastronomic festivals just once a year.

Table 3. Sociodemographic profile of respondents within the identified clusters

Characteristics	Clusters			Total (N = 125)	Kruskal-Wallis H	
	Survivors (N = 19)	Enjoyers (N = 67)	Experiencers (N = 39)		x^2	Sig.
Gender					5.813	0.055
Male	10.5%	13.4%	30.8%	18.4%		
Female	89.5%	86.6%	69.2%	81.6%		
Education					0.010	0.995
High school graduate	15.8%	23.9%	20.5%	21.6%		
Associate degree	0%	1.5%	10.3%	4%		
Bachelor's degree	84.2%	64.2%	53.8%	64%		
Master's degree	0%	9%	12.8%	8.8%		
PhD degree	0%	1.5%	2.6%	1.6%		
Employment status					4.925	0.085
Employed	0%	19.4%	17.9%	16%		
Occasionally employed	5.3%	13.4%	12.8%	12%		
Unemployed	10.5%	7.5%	0%	5.6%		
Student	84.2%	59.7%	69.2%	66.4%		

Characteristics	Clusters			Total (N = 125)	Kruskal-Wallis H	
	Survivors (N = 19)	Enjoyers (N = 67)	Experiencers (N = 39)		x^2	Sig.
How often do you visit rural gastronomic festivals in the Republic of Serbia?					21.008	0.000
Once a year	84.2%	55.2%	30.8%	52%		
Two times a year	0%	26.9%	15.4%	19.2%		
Three times a year	15.8%	11.9%	17.9%	14.4%		
Four times a year	0%	1.5%	7.7%	3.2%		
Five times a year	0%	4.5%	2.6%	3.2%		
From 6 to 10 times a year	0%	0%	7.7%	2.4%		
More than 10 times a year	0%	0%	17.9%	5.6%		

Source: Authors' calculations

Analysis of the motivation to attend rural gastronomic festivals among the identified clusters using the Kruskal-Wallis H test revealed that the clusters differ significantly in terms of the four dimensions of motivation (*Table 4*). The Mann-Whitney U test with Bonferroni correction of alpha value ($\alpha = 0.017$) was used to determine which clusters have statistically significant differences. It was found that experiencers, or cluster consisting of respondents who have the highest level of knowledge and interest in gastronomy, is statistically significantly different from other clusters. Compared to the enjoyers cluster, they reported significantly higher values for the dimensions of taste ($p = 0.002$), experience ($p = 0.000$), people ($p = 0.002$), and inspiration ($p = 0.002$). This indicates that this segment of tourists primarily sees rural gastronomic festivals as an opportunity to try new and varied foods, satisfy curiosity, meet people with similar interests, gain new business contacts, exchange ideas with professionals, and expand their knowledge of gastronomy. On the other hand, survivors, or cluster consisting of respondents with the lowest level of knowledge and interest in gastronomy, compared to a cluster of experiencers, recorded a significantly lower value for the inspiration dimension ($p = 0.010$). This cluster, compared to the cluster of tourists with the highest knowledge of and interest in gastronomy, significantly less motivates the opportunity to expand their knowledge of gastronomy, exchange ideas with professionals, develop cooking skills, etc. These results are consistent with numerous studies (e.g., Pérez Gálvez et al., 2017; Nicoletti et al., 2019; Pérez Gálvez et al., 2020; Cordova-Buiza et al., 2021) that found that tourists' gastronomic motifs for visiting a particular destination are different and conditioned by their interest in gastronomy.

Table 4. Dimensions of motivation for attending rural gastronomic festivals by clusters

Dimensions	Clusters			Kruskal-Wallis H	
	Survivors	Enjoyers	Experiencers	x^2	Sig.
Taste	4.14	4.21	4.67	10.101	0.006
Experience	3.97	4.15	4.67	14.221	0.001
Social status	2.63	2.57	3.01	2.258	0.323
Change	3.95	3.84	4.33	5.986	0.050
People	3.39	3.40	4.06	8.500	0.014
Family	3.86	3.83	4.10	3.365	0.186
Inspiration	3.40	3.59	4.22	11.746	0.003

Source: Authors' calculations

Conclusion

Gastronomy is an extremely important part of the tourism offer of the Republic of Serbia. Gastronomic tourism has numerous implications for the destination, from increasing the number of tourists to creating a tourism destination brand (Jovičić Vuković & Terzić, 2020; Čavić & Mandarić, 2021; Čavić et al., 2021; Božić & Milošević, 2021). Gastronomic festivals, as part of gastronomic tourism, are reviving the rural areas where they are held, and their number is increasing from year to year. Although gastronomic festivals are mostly viewed as events of interest primarily to older tourists, this paper indicates that young tourists are also very interested in gastronomic festivals in Serbia. The current study revealed that the opportunity to try new and varied food, as well as to enjoy the atmosphere at the festival, are the main motives for young tourists to attend rural gastronomic festivals in Serbia. Additionally, this study found that the observed group of tourists can be segmented according to their level of interest in gastronomy, so their motivation can be viewed from the perspective of tourists who have high, moderate, and low knowledge of and interest in gastronomy. The study found that motivation varies among clusters. For example, the results showed that young tourists with high interest and knowledge of gastronomy are most motivated by the opportunity to try new and varied foods, meet people with whom they share similar interests, and gain new knowledge and professional contacts, while these motives are significantly less pronounced among tourists with low interest and knowledge of gastronomy. This segmentation can be extremely useful for the organizers of rural gastronomic festivals because it provides an opportunity to learn the characteristics of their visitors and accordingly create appropriate content.

This study has both theoretical and practical implications. The theoretical implications are reflected in the fact that this study contributes to understanding the motivation of young tourists to attend rural gastronomic festivals in Serbia, which has so far been rather neglected in the literature. Also, observing the motivation of tourists to attend rural gastronomic festivals through gastronomic clusters proposed by Björk and Kauppinen-Räisänen (2016) can be considered another theoretical contribution of this paper. On the other hand, the current study also provides significant knowledge to the organizers

of rural gastronomic festivals, which can be used for the better organization of future events and promotional activities as well. Having in mind that this study revealed the young tourists' motivational factors for attending rural gastronomic festivals in Serbia, by highlighting these motives in promotional activities, the desired cluster of young tourists can be attracted (e.g., by emphasizing that a rural gastronomic festival offers the opportunity to meet a famous chef, the experiencers cluster could be attracted).

This study has several limitations. The relatively small sample size, caused by the inability to conduct field research (due to COVID-19 restrictions) and the time period when the research was conducted (during the summer holidays when students are less likely to check email), can be considered the first limitation of this paper. Then, the limitation of the study is the fact that the respondents were only students of the Faculty of Hotel Management and Tourism in Vrnjačka Banja, who, due to preparation for their future profession, have good knowledge of gastronomy. This led to the segment of respondents with the lowest knowledge of and interest in gastronomy consisting of only 19 respondents. Future research should be conducted on a larger sample, which, in addition to students of the Faculty of Hotel Management and Tourism in Vrnjačka Banja, should include other young tourists in Serbia as well. This will allow for a more thorough examination of the motivation of the "survivors" cluster, as well as the motivation of other clusters. In future studies, it would be interesting to include the results of research conducted through personal interviews with young festival attendees, which will provide a broader picture of the motivation of young tourists to attend rural gastronomic festivals in the Republic of Serbia.

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Conflict of interests

The author declares no conflict of interest.

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CONSUMER'S CHARACTERISTICS AND ATTITUDES TOWARDS ORGANIC FOOD PRODUCTS IN TIMES OF COVID-19 PANDEMIC

Jelena Vapa Tankosić[1], Hasan Hanić[2], Milica Bugarčić[3]

**Corresponding author E-mail: jvapa@fimek.edu.rs*

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ABSTRACT

The pandemic caused by the Covid-19 virus significantly affected the consumers' behavior. The subject of the paper is to analyze the consumer characteristics, the consumer attitudes towards organic food products, as well as the changes in the consumer behavior. The research was performed in 2021 in the Republic of Serbia. The statistical software package SPSS has been utilized for data analysis. Our findings show that, in times of COVID-19 pandemic, the consumers have a very positive perception of nutritional values of organic food products with an expressed willingness to pay 20–30% more for the organic products, in regard to conventional products. The main reason for buying such products is less chemistry and child health. The main reason for insufficient consumption is the high price. The monthly income of irregular consumers of organic food products has predicted the willingness to pay, while the household size has predicted the assessment of the organic products nutritional properties.

Introduction

In the year 2019, according to the official statistics of Eurostat (2020) the organic areas in the European Union have accounted for about 8,5% of the total EU agricultural land. Likewise, global sales of organic produce in the last 15-20 years have seen significant growth. Global tendencies point that its demand has registered significant growth even in the period of the Covid-19 pandemic. According to the official data of the Ministry of Agriculture, Forestry and Water Management of the Republic of

1 Jelena Vapa Tankosić, Full Professor, Faculty of Economics and Engineering Management in Novi Sad, University Business Academy, Cvećarska 2, 21000 Novi Sad, Republic of Serbia, E-mail: jvapa@fimek.edu.rs, ORCID ID (https://orcid.org/0000-0001-8062-1154)

2 Hasan Hanić, Professor Emeritus, Union University, Belgrade Banking Academy, Faculty for Banking, Insurance and Finance, Zmaj Jovina 12, 11000 Belgrade, Republic of Serbia, hasan.hanic@bba.edu.rs, ORCID ID (https://orcid.org/0000-0002-9327-9965)

3 Milica Bugarčić Assistant Professor, Union University, Belgrade Banking Academy, Faculty for Banking, Insurance and Finance, Zmaj Jovina 12, 11000 Belgrade, Republic of Serbia, milica.bugarcic@bba.edu.rs, ORCID ID (https://orcid.org/0000-0002-7096-7685)

Serbia (2019) the share of areas under organic production has had a registered increase of 204% in organic production from the year 2012 till 2018. In the mature organic products markets the research on consumer perceptions has been present for a long time, but in less developed countries organic products markets this type of research is at its beginning. The subject of the paper is to analyze the consumer characteristics, the consumer attitudes towards organic food products, as well as the changes in the consumer behavior in times of Covid-19 pandemic in the Republic of Serbia. The paper has been structured as follows. Firstly an overview of the literature has been presented. Secondly the authors have explained the conducted research method. The section comprising results obtained and interpretation of the results in the discussion is given subsequently. In the final part of the paper, the conclusion has been drawn.

Literature review

Based on a comprehensive analysis of current empirical papers in developed organic markets the consumers are more concerned about the use of pesticides in conventional production and show a greater willingness to pay (WTP) a higher premium for organic produce (Jolly, 1991; Misra et al., 1991; Millock et al., 2004). Household income also influences the ability and regularity of organic purchases. Yiridoe et al. (2005, p.198) emphasize that "empirical evidence supports the hypothesis that product quality characteristics influence consumers' preferences for organic food, with the following being the most important qualities: (1) nutritional value; (2) economic value; (3) freshness; (4) taste and smell; (5) maturity and (6) general appearance (especially of fruits and vegetables)." The findings from the USA by Thompson (1998), as well as by Thompson and Kidwell (1998), showed that the American consumers with the highest level of education were less willing to consume organic products than those with lower education.

In the emerging markets, organic food availability in retail outlets and price has been seen as the primary limiting factors for its consumption. In developed markets, common reasons for organic food purchases include also environmental concerns as well as health reasons. Qualitative appearance, such as taste and visual attractiveness, are significant determinants of the decision to buy organic food produce. In post socialist countries, Zakowska-Biemans (2011) findings point out that Polish organic food consumers have outlined the health, safety, lack of chemicals and quality as the main motivators for organic food purchases. The research findings from the ex-Yugoslavia area by Cerjak et al. (2010) have shown that the Croatian consumers have the most positive attitude towards organic food. The most important reasons for the consumption of organic products in Croatia and Slovenia are the health value and environmental concerns, while consumers in Bosnia and Herzegovina singled out the return to nature, the health value and the safety of organic food products. The research findings of Kuhar and Juvančić (2010) reveal that the most common reasons, for Slovenian consumers, are the availability in retail outlets, income, health and environmental considerations, and visual attractiveness of products. The Croatian consumers, in the findings of Brčić-Stipčević and Petljak (2011), perceive

organic food, as well as products with an eco-label, as tastier than conventional food, and consider them to be healthier for them and their families.

One of the first papers regarding the consumption of organic products by Jolly (1991) concludes that certain variables (age, occupation and size of residence) proved to be statistically significant to explain differences in purchasing behavior between consumers and non-consumers of organic products. Men have shown a greater WTP for organic products than women, while consumers with higher education show a greater WTP for organic products. Respondents aged forty to fifty showed a WTP to pay the highest premium for organic products (40.4%). Ott (1990) has analyzed the impact of socio-demographic characteristics on the consumption of organic products in the United States (South Atlanta). Two-thirds of respondents had a WTP of 5% to 10% for certified fresh products without pesticides, but did not want to accept any "cosmetic defects" (differences in taste, appearance) or insect damage. Misra et al. (1991) have identified that socio-demographic variables, such as race, age, income, and education, have a significant impact on the WTP for organic products. The consumer attitudes towards product testing and certification in the future can also influence the WTP. In addition, the findings of their research showed that respondents who were over 60 and whose annual total household income was more than $35,000 were willing to pay the highest premium for certified pesticide-free products.

As far as the emerging markets of organic production, such as the Republic of Serbia, is concerned, through the last years there is a more positive attitude towards organic products (Vehapi, 2015; Vapa Tankosić et al., 2018; Vapa Tankosić and Hanić, 2019 Ćirić et al., 2020). But, the low purchasing power of consumers and high retail prices are the primary obstacles for higher consumption. Yet, the WTP for organic products in Serbia (Kranjac et al., 2017; Vapa Tankosić et al., 2018; Vapa Tankosić and Hanić, 2019; Vapa Tankosić et al., 2020) has shown that Serbian consumers would be willing to pay a premium up to 20% for organic products. Authors Vlahović et al. (2011) also state that the largest number of consumers think that organic products are safer for human consumption, while on the second place respondents have outlined its' quality. A smaller number of consumers (10%) have mentioned the issue of environmental protection (prevalently respondents under 35 years of age). The findings on organic products consumers by Sekovska et al. (2012) has revealed that the majority of respondents in Macedonia and Serbia consider these products to be healthier, more natural, to have better quality and do represent a threat to the environment. On the other hand, the consumers do not believe that the organic products had a better taste, longer shelf life or better appearance. The research involving cities in Serbia by Vehapi (2015) indicates that most consumers (81.6%) have singled out their health as the main reason for the consumption of organic products in Serbia, then quality (25.9%) and food safety (23%). The consumers' motives show that care for the animal welfare, saving resources for next generations and supporting local farmers are less important reasons. In times of Covid 19 there is an increased consumer concern for their health, reflected in an increased online shopping for organic produce, due to the fear of the Covid-19 (Ćirić et al., 2020).

Materials and methods

Research has been performed in the Republic of Serbia from May 2021 to January 2022. The representative sample was chosen by the random selection method. The questionnaire has encompassed questions on the socio-demographic characteristics of consumers (gender, age, level of education, size of household, level of income, place of living), the frequency of the organic products purchase, the consumers' WTP for organic products (nothing more, up to 10%, 10-20%, 20-30% and more than 30%), the assessment of the organic products nutritional value (1-5) in regard to conventional products, place of purchase of organic product, for whom the organic products are purchased, healthy eating habits, impact of opinions of others on the organic products purchase, the type of organic products purchased and the main reasons and barriers for the consumption of the organic products. The answers received have included 433 respondents that are the consumers of organic products. The first hypothesis that the authors wanted to examine is whether the consumers' socio-demographic characteristics is correlated with the WTP for organic products and the assessment of the organic products nutritional properties. The second hypothesis that the authors wanted to test is whether the consumers' socio-demographic characteristics predict the WTP for organic products (Model 1) and their assessment of the organic products nutritional properties (Model 2). In case when the dependent variable is of the ordinal type, then we observe the events in relation to several categories, and the final cumulative model can be defined by the equation (1):

$$\ln\left(\frac{p(Y \leq j)}{1 - p(Y \leq j)}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_n X_n \qquad (1)$$

where:

X_i = independent (explanatory) variables or predictors

β_i = regression coefficients or parameters

p = the probability of an event occurring

Y = dependent variable divided into j categories.

In applying the models with proportional odds all the assumptions of validity of ordinal regressions have been verified. Model Fitting, Goodness-of-Fit (Pearson and Deviance Goodness-of-fit tests); Cox and Snell, Nagelkerke and McFadden R2, as well as the assumption of parallel lines, have all been performed in order to prove the ordinal model validity. The statistical software package SPSS has been utilized for data analysis.

Results and discussion

Our sample of 433 consumers of organic food products consisted of both male (47.8%) and female (52.2%) consumers. The majority of consumers are of the age between 40 and 50 (33.5%), followed by the age group of 30-40 (26.1%), 20-30 (21.9%), 50-60 (12.5%),

and the least represented consumers are of the age up to 20 (0.2%) and over 60 (5.8%). The majority of the respondents had finished high school (40.6%), had a bachelor degree (35.6%) followed by a master and PhD degree (23.8%). The majority of the respondents lived in a small household comprising 4 members (73.2%) and in the urban areas (80.6%). The majority of the respondents had an average monthly income between €500.00 and €1,000.00 (43.9%) followed by monthly earnings between €200 to 500 (33.7%), €1000-2000 (15.5%), more than €2000 (3.7%), and less than €200 (3.2%).

The largest percentage of consumers buy organic vegetables (34.4%) and fresh fruits (24%), followed by organic meat, grains and dairy produce (15.9%, 14.3% and 11.3%, respectively). Only a few respondents (8.5%) purchase organic food products every day. The answers show that the largest percentage of respondents buys organic products several times a month (43.6%), once a week (35.1%), followed by once in three months (9,9%), once in half a year (1.4%) or once in a year (1.4%). The largest number of respondents (28.4%) has a WTP for organic produce of 20-30% on the price of conventional products. In second place are respondents (26.3%) who are willing to pay 10-20% onto the standard price of products of conventional origin. In third place are respondents (21.5%) who are willing to pay more than 30%. In fourth place are respondents (16.6%) who are willing to pay a margin of 0-10%. Only a few consumers (7.2%) are not willing to pay anything more on the price of conventional products. The next variable refers to the expressed attitudes of the respondents on the assessment of the nutritional properties of the organic food products. The findings indicate that the majority of respondents (39.7%) have rated the nutritional properties with a grade 4 in regard to nutritional properties of conventional products on a scale from 0-5, followed by grade 5 (29.3%), grade 3 (22.9%), grade 2 (4.4%) and grade 1 (3.7%).

The main reasons for buying organic products: less “chemistry” (28.6%), child health care (26.8%), tastier and of better quality (16.9%), health (14.5%), and out of curiosity (6.7%). The consumers buy organic products in mainly in large supermarkets (37.05%), in specialized stores (21.2%), markets (21.9%), directly from organic producers (13.6%) or even they produce it (6.2%). The consumers are primarily buying organic food produce for the whole family (48.7%), for a member for the family (29.3%), for themselves (17.8%) or the products are bought by a family member for them (4.2%). The decision on the purchase is made by themselves (52.4%), or they are influenced by the media (20.6%), family (13.4%), friends (5.5%), doctors (4.6%), or other source (3.5%). The majority of respondents who consider themselves as not having healthy eating habits (55.2%), not completely having healthy eating habits (27.7%) and having only healthy eating habits (17.1%). High environmental awareness (5.8%) and the animal welfare (0.7%) as a general purchasing determinant do not have any motivating power, which indicates a low level of awareness of the above mentioned reasons. The main obstacles to buying organic products are: the price is too high (27.3%), no advantage over conventional products (24%), trust in organic certification (15.9%), not having enough knowledge and experience (9.9%), no formed habit (7.4%), no organic points of sale are found nearby (5.3%), insufficiently developed distribution channels

(4.4%), poor quantity of the organic offer (2.8%), less attractive appearance (2.1%) and regularity in the offer (0.9%).

From the descriptive statistics we can conclude that the consumers have shown a WTP for organic products of 20-30% on the price of conventional products and have attributed the grade 4 to organic products' nutritional properties are the female consumers that are in the age group 40-50, with finished high school, living in a small households with up to 4 members, whose monthly incomes range from €501,00 to €1.000,00.

The first hypothesis that the authors wanted to examine is whether the consumers' socio-demographic characteristics is correlated with the WTP for organic products and the assessment of the organic products nutritional properties. The consumers have been further segmented regarding the regularity of consumption of organic products for the aim of further analysis (Table 1). On the sample of regular consumers, the explanatory power of the model was tested, while on the sample of irregular consumers, the probabilistic power of the model was tested in order to determine the factors influencing irregular consumers to move from the group of irregular consumers to regular.

Table 1. Regularity of consumption of organic products

"How often do you buy organic products?"	**Frequency**	**%**	**Regularity of consumption of organic products**	**Frequency**	**%**
Every day	37	8.5	Regular consumers (1)	189	43.6
Once a week	152	35.1			
Several times in a month	189	43.6	Irregular consumers (2)	244	56.4
Once every three months	43	9.9			
Once in half a year	6	1.4			
Once in a year	6	1.4			
Total	433	100.0	**Total**	433	100.0

Source: author's own elaboration

The Pearson's Chi-square statistics in Table 2, between the observed variables, age and the WTP for the organic food products, in the group of regular consumers, is of corresponding significance (Asimp. Sig. = 0.04) therefore we can conclude that we do have enough reason to claim that the age and the WTP for the organic food products of the regular consumers are, $\chi 2$ (16, n =189) = 27,014, interdependent variables. The relationship between the income and the WTP for the organic food products of the irregular consumers, based on Pearson's Chi-square statistics, is of corresponding significance (Asimp. Sig. = 0.03) and we can conclude that we do have enough reason to claim that the income and the WTP of the irregular consumers, $\chi 2$ (16, n = 244) = 28,089, are interdependent variables. The relationship between the place of living and the WTP for the organic food products of the irregular consumers, based on Pearson's Chi-square statistics is significant (Asimp. Sig. = 0.04) and we can conclude that we do have enough reason to claim that the place of living and WTP of irregular consumers are, $\chi 2$ (4, n = 244) = 9,915, interdependent variables.

Table 2. The level of significance of socio-demographic characteristics of regular and irregular consumers of organic products and WTP for organic food

	WTP for organic food	
Regular consumers	Age	.041
Irregular consumers	Income	.031
	Place of living	.042

Source: Authors' calculations

In order to further verify the relationship between the income and the assessment of the nutritional properties of organic products in the group of irregular consumers based on Pearson's Chi-square statistics and the corresponding significance (Asimp. Sig. = 0.03), we do have enough reason to claim that the following variables in the group of irregular consumers are $\chi 2$ (16, n = 244) = 28,650, interdependent variables.

The Pearson's Chi-square statistics in Table 3, between the observed variables, the place of living and the assessment of the nutritional properties of organic products, in the group of regular consumers is of corresponding significance (Asimp. Sig. = 0.03) and we can conclude that we do have enough reason to claim that these variables are, $\chi 2$ (4, n =189) = 11,076, interdependent variables.

Table 3. The level of significance of socio-demographic characteristics of regular and irregular consumers of organic products and assessment of the nutritional properties of organic products

	Assessment of the nutritional properties of organic products	
Regular consumers	Place of living	.02
Irregular consumers	Income	.02

Source: Authors' calculations

The second hypothesis that the authors wanted to test is whether the consumers' socio-demographic characteristics predict the WTP for organic products and consumers' assessment of the organic products nutritional properties. By using the ordinal logistic regression with the logit link function the influence of independent predictors (gender, age, education level, household size, place of residence and monthly income) on the WTP for organic products, as a dependent variable has been analyzed (Model 1). Before interpreting the model's regression coefficients, the assumptions regarding model adequacy have been examined. After the first testing of the model on the total sample of organic consumers, the ordinal regression parameters did not prove to be significant. The subsequent testing of the model was done by splitting the sample into groups based on regularity of consumption. First of all, in order to confirm that multicollinearity was not present in the model it was tested using VIF. Based on the results obtained

from the Model Fitting ($\chi2(4)$= 13,105; p= 0.01) it can be concluded that the statistical significance of the models is present, in a sample of irregular consumers of organic products, and that the model with predictor variables makes a significant contribution to the prediction of the dependent variable (consumers' WTP for organic products). The value of the coefficient of determination (Nagelkerke Pseudo R2) has indicated 8.9% of the variance of the model was explained by the independent variables. The model further proved to be significant as the Goodness-of-Fit test proved the null hypothesis that the fit is good. As this hypothesis has not been rejected (p>0.05) it has been concluded that the data and the model predictions are similar and that the model is good ($\chi2$ (12) =16.859; p=0.15). In addition to the results of assumptions regarding the model adequacy, a test of parallel lines has been performed. The assumption of proportional odds was confirmed by the result ($\chi2$ =18,634, df= 12, p=0.98). The process of verifying the adequacy of the Model 1 has been fully completed.

Table 4. Parameter Estimates of the Model 1

Parameter Estimates								
	Estimate	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval	
							Lower Bound	Upper Bound
up to 200 euros	-2,302	1,067	4,656	1	,031	**,100**	-4,394	-,211
201-500 euros	-2,265	,945	5,740	1	,017	**,104**	-4,117	-,412
500-1000 euros	-1,913	,934	4,199	1	,040	**,148**	-3,743	-,083
1000-2000 euros	-1,232	,971	1,610	1	,205	,292	-3,136	,671
more than 2000 euros	0[a]	.	.	0	.	1,000	.	.

Link function: logit

a) This parameter is set to zero because it is redundant.

Source: Authors' calculations

The results of the final model obtained by ordinal regression (Table 4) have shown the statistical significance of only one independent variable, i.e. Income (category: up to 200 euros; 201-500 and 500-1000 euros), of the irregular consumers of organic products, which proved to be a significant predictor of the WTP for organic products (Sig. 0.03; 0.01 and 0.04 respectively). Based on the Exp (B) value for the explanatory variable Total monthly income, we can say that the probability of willingness of the consumers, who have a monthly income up to 200 euros; 201-500 and 500-1000 euros, to pay a higher price for the purchase of the organic products decreases by 0.10, 0.10 and 0.14 respectively, compared to those respondents that have an income of more than 2000 euros, controlling all other factors in the model. The following findings that the monthly income as socio-demographic characteristics, has a significant impact on the

likelihood that consumers will be willing to pay higher amount for organic products were confirmed by the findings in the USA (Jolly, 1991; Misra et al., 1991), Denmark (Millock et al., 2004), Greece (Tsakiridou et al., 2006), Great Britain and Denmark (Wier et al., 2008), Turkey (Akgungor et al., 2010), Iran (Haghjou et al., 2013), Slovakia and the Czech Republic (Zámková & Prokop, 2014), the United Arab Emirates (Muhammad et al., 2015), Croatia (Anić et al., 2015) and Thailand (Sriwaranun et al., 2015). The higher monthly household income positively influences the WTP for organic produce in Serbia (Vapa Tankosić et al., 2020).

Subsequently the authors have investigated whether the socio-demographic characteristics of consumers' predict the consumers' assessment of the nutritional properties of organic products (Model 2). After the initial testing of the model on the total sample of organic consumers, the ordinal regression parameters did not prove to be significant. The procedure was then repeated by splitting the sample into groups based on the regularity of consumption and subsequent testing of the model was done. The multicollinearity was tested and confirmed not to be present in the model. The Model Fitting provided us with information on whether the model with predictor variable can be marked as satisfactory. Based on the obtained fitting results ($\chi 2$ (2) = 5,743; p =0.05), the model further proved to be significant, on the sample of irregular organic consumers, as the Goodness-of-Fit test proved that the fit is good. Nagelkerke's Pseudo-R2 has indicated a satisfactory value of the variance of the model. As this hypothesis has not been rejected (p>.05) it has been concluded that the model is good ($\chi 2$ (6) =6,355; p =0.38). The test of parallel lines has been performed. The assumption of proportional odds has been confirmed ($\chi 2$ =6,406, df= 6, p=0.98).

Table 5. Parameter Estimates of the Model 2

Parameter Estimates								
	Estimate	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval	
							Lower Bound	Upper Bound
Small (1-4)	,938	,408	5,294	1	,021	**2,555**	,139	1,737
Middle (4-6)	,562	,445	1,598	1	,206	1,754	-,309	1,433
Big (over 6)	0[a]	.	.	0	.	1,000	.	.

Link function: logit

a) This parameter is set to zero because it is redundant.

Source: Authors' calculations

The results of the final model obtained (Table 5) have shown the statistical significance of only one independent variable, i.e. Household size (category: Small 1-4) proved to be a significant predictor (Sig. 0.02). This indicated that the probability of the irregular consumers of organic products who live in a small household to assess the organic products nutritional properties with a higher grade increases by 2.55, compared to

those respondents who live in a big household (more than over 6 household members), controlling all other factors in the model. As small households have a possibility of a more frequent organic food, in regard to larger households' tight monthly budget, and usually live in urban areas where they are further away from nature they can view these products as healthier than products from conventional production. Loureiro et al. (2001) findings confirm that the presence of children under the age of eighteen in the household increases the likelihood of consuming organic products, while the size of the household negatively affects consumption.

Conclusion

The market of consumers of organic food products in times of COVID-19 pandemic is dominated by females, the population between the ages of 40-50, with high school diploma, household size of up to four members, with monthly household income of 500 to 1,000 euros living in the city. The consumers buy organic food products for the whole family. Only a small number of respondents buy organic products every day and the majority of consumers buy organic products several times a month. Regarding the type of organic products that consumers most often buy, the majority of respondents buy organic vegetables and fresh fruits, while the purchase of organic products takes place mostly in larger supermarkets. From the findings we can conclude that food safety ("less chemistry) and child health are the main motives for consuming organic products.

Our findings point out that the majority of consumers in times of COVID-19 pandemic have a very positive attitude towards nutritional values of organic products, in relation to the conventional products. The main reason for insufficient consumption is primarily, and still, the high price. The findings also show that the consumers have expressed the WTP of 20–30% for the organic food products, relative to the price of conventionally produced products. Having in mind that in the sample of irregular consumers, the probabilistic power of the model was tested in order to determine the factors influencing irregular consumers to move from the group of irregular consumers to regular, the findings have shown that the monthly income determines the WTP which is reflected primarily in the low purchasing power in the Republic of Serbia thus preventing the irregular organic produce consumers to become regular consumers. The household size (small 1-4) has predicted the irregular consumers' assessment of the organic products nutritional properties which can relate to their potential higher assessment of nutritional properties which is due to more frequent consumption of organic purchase, compared to larger household which have more expenses and lower monthly budget for the purchase of organic food produce. As the organic market in our country gradually expands the knowledge and awareness of better informed and educated consumers can represent the potential for further growth of consumption of these products, even though insufficient consumer confidence is still present (albeit to a lesser extent than in the previous years). The socio-demographic variables can give further insight into a profile of organic consumers and the success in this market depends on marketing efficiency and targeted marketing strategies for this niche market, especially in times of COVID-19 pandemic.

Conflict of interests

The authors declare no conflict of interest.

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INTANGIBLE CULTURAL HERITAGE AND THEIR INFLUENCE ON FINANCIAL RESULTS IN RURAL TOURISM

Krešimir Starčević[1], Željko Vojinović[2], Jerko Glavaš[3]

**Corresponding author E-mail: zeljko.vojinovic@ef.uns.ac.rs*

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ABSTRACT

Many scientists and native stakeholders are increasingly pointing to the importance of connection between cultural heritage and tourism, and influence of that connection on the financial results of entrepreneurs in rural tourism. Therefore, the importance of cultural heritage and especially intangible cultural heritage is being discussed. In the continuation, the status of connection between intangible cultural heritage and rural tourism is analyzed. The paper further points to the need for planned and organized, stronger content linking of rural tourism and intangible cultural heritage, that should influence financial results of the entrepreneurs in rural tourism. An example from the Croatia is given which is using intangible cultural heritage (traditional music and dance) in (rural) tourism offering. The link between this connection and financial results of the company is analyzed. The conclusion provides recommendations for better connection of the intangible cultural heritage and the rural tourism, ensuring the better financial results.

Introduction

At the beginning of the paper, the concepts of (intangible) cultural heritage and its status in the Republic of Croatia are being discussed. The paper later describes the degree of protection that Croatian intangible cultural heritage enjoys in the Republic of Croatia, and in particular the status of protection that Croatian intangible cultural heritage enjoys

1 Krešimir Starčević, Atlantic grupa d.d., 10000 Zagreb, Mirmarska 23; Phone: +385916103507; E-mail: starcevic.kresimir@gmail.com, ORCID ID (https://orcid.org/0000-0002-4844-5426)

2 Željko Vojinović, Associate professor, Univerzitet u Novom Sadu, Ekonomski fakultet Subotica, Segedinski put 09-11, E-mail: zeljko.vojinovic@ef.uns.ac.rs, Phone: 00381 24 628037, ORCID ID (https://orcid.org/0000-0002-2685-5504)

3 Jerko Glavaš, Full profesor, Josip Juraj Strossmayer University of Osijek, Faculty of Economics in Osijek, Trg Ljudevita Gaja 7, Osijek, e-mail: jerko.glavas@efos.hr, Phone: 00 385 95 196 5719, ORCID ID (https://orcid.org/0000-0001-9227-1227)

at UNESCO[4]. Furthermore, a brief overview is given of the importance of the tourism sector for the Croatian economy, and especially cultural tourism and rural tourism. The connection between cultural tourism and rural tourism is analyzed, along with the analysis of the business potential of Croatian intangible cultural heritage in rural tourism. Besides that, the influence of inclusion of the intangible cultural heritage in rural tourism on the financial results of the entrepreneurs is being described. The analysis of the business potential of intangible cultural heritage (especially traditional music and dance) in the rural tourism sector uses a concrete example of organized and institutional interpretation of intangible cultural heritage, which confirms there is a close link between intangible cultural heritage (especially traditional music and dance) and rural tourism, i.e. that the inclusion of traditional music and dance in the offer of rural tourism increases its quality and visibility, and thus financial results of it. After that, the methodology used and the hypothesis set up are briefly described, and the research results are commented on. Ultimately, conclusions are reached that confirm the hypothesis, i.e. confirm the role and great importance of intangible cultural heritage (especially traditional music and dance) in the overall result of the entrepreneurs in rural tourism.

Cultural heritage

According to Anić (1998), heritage represents all of the preserved and cherished cultural goods inherited from the past, which preserves and nurtures culture, tradition and native wisdom. Tomašević and Horvat (2012:122) point out that cultural heritage is one of the capitals that is inherited and whose possession implies living in a certain area. Heritage in the broadest sense of the word is a common resource and represents a kind of common good sensitive to overexploitation and insufficient funding. Pacelli and Sica (2020:6) state that: "cultural heritage is a dynamic and ever-expanding set of goods characterized by strong and expressive aesthetics. Cultural heritage expresses the unique values of the society from which it originates, and therefore cultural heritage has an important economic value that, in addition to historical, artistic and cultural value, allows it to be an important source of local and national income." Although there are various approaches in defining traditional culture and heritage, this paper relies on its definition as "works of its artists, architects, composers, writers, and philosophers, works of unknown authors who have become an integral part of national wealth and the totality of values that give life thought. These are works of tangible and intangible origin that express the creativity of a particular people, such as language, music, customs, beliefs, places and historical monuments, literature, works of art, archives and libraries" (Gredičak, 2009:198). According to Hafstein (2013), UNESCO (as the United Nations organization "in charge of culture") has adopted and implemented several conventions over time to prevent the deterioration of cultural heritage in order to prevent and preserve, among others, such physical sites. Among numerous conventions, however, the convention governing intangible heritage stands out because it represents a revolutionary step towards recognizing the intangible (spiritual, intangible) economic resource.

4 UNESCO is a specialized agency of United Nations in charge of intellectual and ethical issues in the field of education, science and culture. It was established in 1945

Intangible cultural heritage

The Heritage Strategy (Ministry of Culture, 2019) accepts the division of cultural heritage into tangible (movable and immovable) and intangible heritage. According to the expression of this strategy, intangible forms of cultural heritage are phenomena of man's spiritual creativity in the past. A similar division of cultural goods into tangible (immovable and movable) and intangible is also found in Articles 7, 8 and 9 of the Act on the Protection and Preservation of Cultural Heritage (O.G. 69/1999). The Heritage Strategy notes that intangible heritage is endangered and could potentially disappear. This is influenced by demographic changes and declining population in certain areas. In addition to positive connotations, there are "negative connotations that come with the development of tourism and economic and technological progress that bring changes in lifestyle and production and could lead to disappearance or commercialization of some knowledge, skills and customs" (Ministry of Culture, 2011:29). The division of cultural heritage into tangible and intangible is also explained by Šošić (2014) who suggests that the concept of cultural heritage not only encompasses tangible forms of cultural heritage but also includes intangible achievements of human culture. Pacelli and Sica (2020:5) point out the distinction between tangible and intangible heritage whereby they describe tangible heritage as having a defined and stable form (includes paintings, statues, architecture, and archaeological artifacts), and intangible as existing only in moments when they take place and includes festivals, popular performances, processions, religious ceremonies, sporting events and competitions. Carek (2004) explains that intangible heritage by a definition usually includes various beliefs, living customs, accumulated knowledge, different skills, and phenomena of spiritual creation, that has been transmitted by tradition. Important is that societies, groups or individuals recognize all of these as their heritage (language, dialects, speech, oral literature, traditional crafts) and arts, folklore, music, dance, tradition, games, rituals, customs, etc.). As a result of efforts to equalize the status of intangible and tangible cultural heritage, UNESCO in 2003 adopted the Convention for Safeguarding of the Intangible Cultural Heritage (hereinafter: "the Convention").

Protection of the intangible cultural heritage

Since 1999, based on the Law on the Protection and Preservation of Cultural Heritage, intangible cultural goods have enjoyed special protection as goods of interest to the Republic of Croatia. Since that year, 195[5] goods have been entered on the List of Protected Cultural Property of the Republic of Croatia, and 10[6] goods have been entered on the List of Preventively Protected Intangible Goods of the Republic of Croatia. The

5 Status on February 24, 2022

6 Status on February 24, 2022

database on the Register of Cultural Heritage of the Republic of Croatia[7] serves as basic source of data describing all intangible assets enjoying the legal protection. Concern for the preservation of intangible cultural heritage is the primary task of the holder of intangible heritage as well as the local community in whose area various projects and activities are implemented. With the entry into force of the Convention, UNESCO has established three new lists (UNESCO, 2003):

1. Representative List of the Intangible Cultural Heritage of Humanity

2. List of Intangible Cultural Heritage in Need of Urgent Protection

3. Register of Good Practices for the Preservation of Intangible Cultural Heritage.

The Republic of Croatia has inscribed intangible cultural assets on all three UNESCO Intangible Cultural Heritage Lists.[8] As many as 16 assets are inscribed on the Representative List of the Intangible Cultural Heritage of Humanity. In 2010, one cultural asset was entered in the second List, i.e. *Ojkanje* as a musical expression, while in the third register, the *Batana Ecomuseum* was inscribed in 2016.

Economic importance of the tourism industry

According to European Union statistics, the Republic of Croatia is, despite the undisputed growth from year to year, only the eighth most popular European tourist destination. In front of it are Spain, Italy, France, the United Kingdom, Austria, Greece and Germany. Revenue from tourism in the GDP of Croatia in 2019 was a high 19.5%, suggesting that Croatia is dependent on tourism. Petračić (2018) points out that this speaks to the dependence of the entire economy on the service industry. The service industry cannot be the basis for the development of the national economy, but it can certainly be one of the complementary activities that will improve its prosperity. The Republic of Croatia is already recognized as a destination for the sun and the sea, and it is increasingly being promoted as a "green" country. Petračić (2018) notes that the national strategic document for the development of tourism in the Republic of Croatia until 2020 (adopted by the Croatian Parliament) clearly shows that the dominant tourist product is the "sun and the sea" with a physical volume of about 85%. Unfortunately, specific forms of tourism, and thus cultural tourism and rural tourism, are less developed. Rural tourism, including mountain areas, is estimated to account for only 3% of international travel, with an annual growth rate of 6%. Croatia's offer of rural tourism is developing relatively slowly and with special emphasis on the continental area. For future generations to be able to engage in tourism, it is necessary

7 List of all protected intangible cultural heritage goods, inscribed in List of Protected Cultural Property of the Republic of Croatia is available at: https://min-kulture.gov.hr/izdvojeno/kulturna-bastina/registar-kulturnih-dobara-16371/16371; (February 24, 2022.)

8 Full list and description of intangible cultural heritage goods, inscribed in all three UNESCO lists of intangible cultural heritage is available at: https://min-kulture.gov.hr/izdvojeno/kulturna-bastina/kulturna-bastina-na-unesco-ovim-popisima/17251 (February 24, 2022.)

to develop it on a year-round level and within the entire area as well as according to the concept of sustainable development. Tourism, as an integral part of the country's economy, has various effects that can have a positive or negative impact on the well-being of the entire country, as it includes public, private and non-profit sectors, as well as the population. Through its effects, tourism as an economic branch influences the achievement of economic balance in the country. "The essence of tourism development is based on the fact that tourism develops primarily because of its economic benefits that to a greater or lesser extent contribute to the development of national, regional and especially local economy" (Čavlek, et al. 2011:253; Cipek & Ljutić, 2021; Cvjetković et al., 2021; Kalaba & Pantović, 2020).

Cultural tourism

Due to the importance of cultural heritage in the economic life of the Republic of Croatia, especially tourism, it is important to enlighten all stakeholders in culture and heritage about the proper identification of cultural heritage in its area, as well as providing funds for care and heritage economic resource. Namely, as cultural heritage is one of the key resources in the tourism sector (compared to other economic sectors, tourism is able to repeatedly use cultural heritage), it is important to know which elements of the offer affect the choice of destination. Robinson and Smith (2006) say that cultural heritage is the foundation of tourism and emphasize the great impact of cultural heritage on the growth and development of tourism, as well as the involvement of various social groups in the necessary development processes in tourism. Richards (1996) points out that heritage through tourism can be a driver of the local and national economy by increasing economic activity, number of employees and income. McKercher and Du Cros (2002) also hold that cultural heritage is a tourist attractive, and thus economically usable form of culture of a society or area. Goodwin (2002) points out that the existence of diversity, both cultural and natural heritage, creates many economic opportunities for the local community, which allows the formation of a specific tourism product. Richards (2000) comments that cultural heritage is a vital resource for the growth and development of the tourism sector, while on the other hand tourism contributes to cultural development. McCain and Ray (2003) point out that the continuous growth of visits by tourists related to culture and heritage has stimulated research that analyzes the topic of heritage and tourism, which has led to new definitions of heritage tourism or tourism of heritage as "tourism related to what we have inherited" (McCain and Ray, 2003:714). Southall and Robinson (2011:176-188) state that "heritage tourism can include visits to (authentic) places of special historical importance and experiences that are experienced in the same places in a targeted, frequent and organized way".

Rural tourism

In scientific discussions and practice, the terms "rural tourism" and "agritourism" are often confused or equated. In recent times, there is a trend to replace the term agritourism - in the strategic notion of development - with the broader term "rural tourism", of which

it is an integral part. Even though there are some disagreements in the definition of rural tourism, it can be concluded that: "rural tourism includes all tourism services/activities/types of tourism that occur within rural areas, whereby rural areas are areas dominated by natural environment, rural environment, small settlements, isolated agricultural holdings, while agriculture and forestry are the main economic activities" (Ivandić, Kunst, 2015). Petračić (2018) notes that rural tourism is related to the heritage, identity and tradition of a particular area because its main role is to preserve it in a way that introduces visitors to the way of life in a particular environment and rural customs. Rural tourism is a common name for all special forms of tourism in rural areas: tourism on farms, hunting, fishing, ecotourism, health, sports and recreation, residential (holiday homes), adventure, camping tourism, nautical tourism, gastronomic, wine, cultural tourism, religious tourism and other special forms. According to Krajnović, Čičin-Šain and Predovan (2011), rural tourism in the world is growing, both due to increased demand in the tourism market and due to public support for its development. It is especially important to note that rural areas are particularly sensitive areas for the preservation of natural resources and cultural and historical heritage. "Tourist nomads of today" are looking for new places and ways where and how to spend their vacation or short vacations, often driven by the desire to get to know the domicile (receptive) environments they travel to, as well as the search for indigenous and authentic values and forgotten ways of life. An adequate response to this market challenge is (also) rural tourism. Therefore, each country that aims to increase its competitiveness should necessarily consider its own potential for the development of this form of tourism and find ways to valorize them. Namely, according to Petračić (2018), cultural tourism in rural areas is tourism of special interests that can be defined as a form of tourism in which the visitor goes to a tourist destination to visit the material and cultural-historical heritage of a region or participate in activities within the intangible heritage. Namely, the rural area offers a number of benefits, attractions and sights that would meet the cultural needs of tourists. Also, a rural area can be a destination for tourists primarily because of a cultural site or other tangible and intangible property. Hitrec (1995) notes that it is common for the term cultural tourism to mean only monumental heritage, i.e. museum exhibitions, concerts and festivals. However, the notion of cultural tourism is broader in scope. It also includes the spiritual dimension of culture and the presentation of cultural tourism. The complex product of cultural tourism must contain both material and intangible side of the product, which means that it should include participation in traditional customs of the receptive locality and environment, tasting local gastronomic offer, living in traditional architecture, and especially listening to and experiencing traditional music from local (rural) area. As one of the emerging forms of rural tourism is cultural tourism in rural areas, the next chapter analyzes the business potential of traditional music as cultural (intangible) heritage in rural tourism.

Business potential of intangible cultural heritage in rural tourism industry

According to Rudan&Stipanović (2021), in typical rural destinations, one can design, develop and implement, various sorts, types and forms of tourism. This chapter focuses

on one particular form, namely cultural tourism in rural tourism, based on traditional music and dances, being the part of the rich intangible heritage that could be found and offered in the rural destination. Regarding the cultural tourism, it has been proven that visit to cultural attractions (e.g. history, art, heritage….) and ability for tourist to meet their cultural needs and interests, has become the most important motivation for tourist to travel to a certain destination. It has become obvious that the most valuable tourism resource of a rural destination is and will be the cultural heritage. Most of the tourists would like to learn about tangible and intangible forms of culture existing in certain rural destination. Rudan&Stipanović (2021) further explain that integrated tourist-destination product should include music as an essential component thereof. When offered through the integrated tourist product, music always provides an added value to every offering in a destination, especially in rural destination. In order to better promote offering in any rural tourist destination, many tourist destinations use various forms and types of music and sound experience aimed to creation of a unique and specific experience in certain destination, regardless the initial tourists' motivation for visiting that particular destination. Music in general, and specifically traditional music and dances of a certain region or locality, represent a distinctive feature between rural areas competing at the tourist market, developing their own various forms of rural tourism. According to Kušen (2002), music from the certain region, shows to be one of the most important elements of that region's identity. Some tourist (rural) destinations have managed to develop diversity in tourist offering based on the music form the region, which is including traditional music and dances. Such diversity is remarkably improving the content quality of particular tourism offering in the destination. Where tourist offers are enriched with the elements of traditional music and dances, it can create unforgettable memories for the visitors that would for sure remind them of their stay in such a destination. Traditional music of a tourist destination should be considered as the totality of all its forms (music, dances, signing, costumes, etc...) and should be focused on various performing arts offering traditional music and dances from rural region. This has become a key success formula to satisfy ever growing demands and expectations of visitors. Local residents being proud of their heritage (traditional music, dances etc…), which helps these goods to gradually become a crucial element of the integrated tourist offer in rural destination. Such integrated offering is very often presented at gastronomic events, cultural events, festivals and similar events. Traditional offering, presenting interaction of music, folklore, customs and traditional lifestyle in rural regions, should become a key focus of the rural tourism entrepreneurs. One could conclude that in Croatia, traditional music should evolve into the crucial part of the integrated tourism product offering, especially in the rural tourist destinations. The importance of music resources from rural destinations grows, resulting in growing appeal of the rural regions as such. It is obvious that music from rural region "consumed" in rural destination, evokes emotions and memories related to a visit to a rural tourist destination.

Therefore, there is an urgent need for all stakeholders involved in designing a tourism offering, to act in synergy when designing the sustainable and well-conceived tourism offering in rural destinations that would include music in general and traditional music (as intangible heritage) in the tourism offering. Finally, management of the cultural and creative tourism offering should integrate traditional music with all other forms of the offering, such as the food&wine, festivals, gastronomic events, etc…

Inclusion of intangible cultural heritage in rural tourism and its influence on the financial results

As it has been described in the previous paragraph, a well thought out integration of music, particularly traditional music (intangible heritage) in the offer of tourist (rural) destinations, is increasing the variety and quality of the (rural) tourism in general. Since such offering should be integrated with all other types of the offers (traditional food, domestic wines, various festivals and other events), it is more than obvious that such "new" cultural and creative offering in rural tourism should have an impact on the financial results of the entrepreneurs in rural tourism industry. On the one hand, the expansion of offering within the (rural) tourism activities, directly increases the development of the tourism industry, increasing the occupancy rate and, consequently, sales revenue. On the other hand, the development of (rural) tourism can significantly improve the business environment, which has an indirect effect on the business performance of companies in the tourism industry. The study developed by Chen (2007) showed that the growth of tourism improves economic conditions which, consequently, increases the performance of companies. Any tourism company that succeeds to include intangible cultural heritage in its tourism products or services, and later sell it at the market (domestic or foreign) with a satisfactory profit rate, observing the presence of other providers, achieves a certain competitive advantage. Creating and maintaining a competitive advantage by defining a new and different tourism product (based on the inclusion of intangible cultural heritage) might become the essence of any competitive strategy in the modern tourism industry. Namely, this special competence and competitiveness that enables superiority compared to other tourism companies in the business area, is a key preoccupation of all competitive oriented companies and important for achieving the better financial results of entrepreneurs in tourism.

Example from Croatia - Etnoland Dalmati, Pakovo selo

The Interpretation Center of Traditional Culture and Heritage - Etnoland Dalmati, from Pakovo Selo near Drniš (Croatia), offers visitors an authentic experience of an old Dalmatian village. Within the village, tourists are able to see the reconstructed stone houses and dry-stone walls. Apart from the architecture and old construction, the offer for visitors includes gastronomic experiences, traditional music and dance experiences (Figure 2). Apart from the material cultural attractions, in Etnoland tourists can learn about a destination's intangible culture as well. Together with the local food and

domestic wine, Etnoland offers various interaction with traditional music and sounds that create a specific experience of the specific locality (ojkalica, nijemo kolo, diple…). Such an offer helps to strengthen the position and recognition of that particular rural destination. If arranged upfront, tourists could experience performance of the local folkdance groups (Figure 1), but also hear other amateur and professional performers of traditional music and dances from other parts of Croatia.

Figure 1. Folkdance group after performance of "nijemo kolo" in Etnoland

Source: https://etnoland.com/; (25.02.2022.)

Tourists in Etnoland could also learn how to dance "nijemo kolo" or even how to play "diple" (Figure 3).

Figure 2. Tourists learn to dance "nijemo kolo" in Etnoland

Source: https://etnoland.com/; (25.02.2022.)

Figure 3. Authentic music instrument from the region – *diple*

Source: https://www.gajde.com/instrumenti/dalmatinski-mih/ (26.02.2022.)

Based on the comprehensive and structured offer – consisting of typical tourist products well-known in rural tourist areas, and modern products based on the cultural heritage (tangible and intangible), i.e. cultural products that include traditional music and dance performances – Etnoland Dalmati has been recording continuous increase of income and profit (Table 1).[9]

Table 1. Shortened P&L account of the company Dalmati d.o.o.

Business year	Total income (HRK)	Income from subsidies (HRK)	Total income w/o subsidies (HRK)	Total cost (HRK)	Profit before tax (HRK)	Profit before tax – w/o subsidies (HRK)
2017.	2.795.254	476.263	2.318.991	2.348.356	446.898	(29.365)
2018.	2.881.437	171.029	2.710.408	2.487.574	393.863	222.834
2019.	2.899.854	118.395	2.781.459	2.505.941	393.913	275.518

Source: https://etnoland.com/; (25 February 2022)

This serves as evidence that traditional music and dance, if included in the offer of tourism sites and entrepreneurs, and when properly combined with all other offers (events, festivals, food&wine etc.) represent integrated tourist-destination product that increases the quality of the service and improve the financial results of the entrepreneurs, as well as enhances development of rural tourism in Croatia.

9 Results for the Y2020 and Y2021 have been heavily damaged by COVID, and are therefore hereby excluded

Results and discussions

This paper covered theoretical considerations and a shortened form of secondary research, i.e. used the data from an analysis carried out within the relevant legal framework and literature in the field of cultural (intangible) heritage and rural tourism in the Republic of Croatia as well as the information gathered from the example case analyzed. Therefore, the scientific methods that are being used when drafting this paper, have been determined by the elements of all the parts of the research. In the preparation of the paper, the following scientific methods have been used: description method, classification method, methods of analysis and synthesis, and the compilation method. The compilation model was used carefully, with the truthful quoting and citing of the sources. The problems elaborated within this paper, have resulted in setting up the main research question as well as the hypothesis. The main research question was trying to reveal whether there was a connection between the intangible cultural heritage (traditional music) and rural tourism in general and in particular in Croatia. After the main research question, the following hypothesis, tested by the short research and analysis, has been set up in this paper. Hypothesis (H): *Inclusion of traditional music and dance, as intangible cultural heritage, in the offer of rural tourism destinations increases the quality of the offer, improve the financial results of entrepreneurs in tourism and contributes to the development of rural tourism in the Republic of Croatia.* Having in mind the great importance and internationally recognized value of Croatian intangible heritage (UNESCO), it is crucial to understand that such value should be more extensively utilized in a process of defining and developing the rural tourism of Croatia. Therefore, the issue of this paper is very actual and should be further in focus of decision makers and policy makers who have a chance to influence the future development and shape of the Croatian rural tourism. Given the fact that regulation in the field of intangible cultural heritage is underdeveloped and the fact that legal framework for rural tourism is still in development (the new Tourism Strategy is still being drafted), there is a permanent need for further monitoring of the relevant regulation in both fields, intangible cultural heritage and rural tourism. As a result of short analyses and research performed within this paper, it is obvious that cultural (intangible) heritage is attracting more attention considering development of cultural and rural tourism in Croatia. Cited literature shows that awareness of all stakeholders involved in rural tourism has arisen, and new trends are going in a direction of wider inclusion of cultural heritage in the offering of rural tourism in Croatia. The results of a shortened form of secondary research, based on the information gathered from the example case analyzed, are clearly pointing out that careful and expert inclusion of intangible cultural heritage in a tourist offer of Etnoland as a place with professional, organized and institutional interpretation of intangible cultural heritage, contributes to the financial results of the company but also the quality of rural tourism offering and recognition in Croatia.

Conclusions

The more we recognize a great value of cultural (intangible) heritage as an economic resource (especially in tourism industry), the more we could contribute further to the development of tourism industry, especially cultural and rural tourism industry in Croatia. There is an obvious need for further development of legal framework for business activities in the field of cultural heritage, but also in the field of rural tourism. Experiences from other European countries confirm that rural tourism is becoming more and more attractive for tourists. If typical offering in the rural tourism industry is enriched by great, but unutilized, values of cultural (intangible) heritage, tourism industry could record even better financial results than in the past. Therefore, recommendation for further research should instruct scientists and practitioners to investigate even deeper the possibilities of inclusion of even more intangible cultural heritage goods into the offering of rural tourism in Croatia. It is to be hoped that policymakers and decision makers will recognize the importance of inclusion of cultural (intangible) heritage in the offering of tourism (rural) industry and, within their scope of responsibilities, enable the entrepreneurs to record better financial results and therefore influence the future development and shape of the Croatian rural tourism.

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Conflict of interests

The authors hereby declare there are no conflict of interest.

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WHY I BUY ORGANIC PRODUCTS – PERCEPTION OF MIDDLE INCOME COUNTRY CONSUMERS (REPUBLIC OF SERBIA)

Dragan Milić[1], Mirela Tomaš Simin[2], Danica Glavaš-Trbić[3], Vuk Radojević[4], Nataša Vukelić[5]

**Corresponding author E-mail: vuk.radojevic@polj.uns.ac.rs*

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ABSTRACT

The research was conducted on consumers and potential consumers of organic products in Serbia. In countries with average low incomes, knowledge of the organic products market is important because one of the often singled out characteristics of organic products is their premium price. Knowing the motives of potential consumers of these products and the characteristics that they value more gives the opportunity to improve this production. The research involved 496 respondents, older than 18, with different levels of education, marital status and other socio-demographic characteristics. The results showed that a healthy, quality product, which has no additives and harmful substances and has the best price-quality ratio with a clearly defined shelf life, are the basic factors for buying food products, the factors that most influence a positive purchase decision. The authors conclude that highlighting these characteristics in organic products can lead to further development of this market.

1 Dragan Milić, PhD, Associate Professor, University of Novi Sad, Faculty of Agriculture, Trg Dositeja Obradovića 8, 21000 Novi Sad, Serbia, E-mail: dragan.milic@polj.edu.rs, ORCID ID (https://orcid.org/0000-0003-0377-1540)

2 Mirela Tomaš Simin, PhD, Assistant Professor, University of Novi Sad, Faculty of Agriculture, Trg Dositeja Obradovića 8, 21000 Novi Sad, Serbia, E-mail: mirela.tomas@polj.edu.rs, ORCID ID (https://orcid.org/0000-0003-1833-9857)

3 Danica Glavaš-Trbić, PhD, Assistant Professor, University of Novi Sad, Faculty of Agriculture, Trg Dositeja Obradovića 8, 21000 Novi Sad, Serbia, E-mail: danicagt@polj.uns.ac.rs, ORCID ID (https://orcid.org/0000-0002-5990-6558)

4 Vuk Radojević, PhD, Assistant Professor, University of Novi Sad, Faculty of Agriculture, Trg Dositeja Obradovića 8, 21000 Novi Sad, Serbia, Corresponding E-mail: vuk.radojevic@polj.uns.ac.rs, ORCID ID (http://orcid.org/0000-0002-3453-5236)

5 Nataša Vukelić, PhD, Associate Professor, University of Novi Sad, Faculty of Agriculture, Trg Dositeja Obradovića 8, 21000 Novi Sad, Serbia, E-mail: vukelin@polj.uns.ac.rs, ORCID ID (https://orcid.org/0000-0001-7516-9204)

Introduction

With the development of modern societies and markets, food consumption patterns are changing significantly primarily under the influence of environmental and health issues. Today's consumers largely pay attention to issues of food quality and safety, which also affects their behavior in the purchase or consumption of food products. In recent decades, more and more attention has been paid to the production and processing of "organic products", which, in terms of the market, leads to an increase in their economic importance. The reasons for that are numerous, but they mainly concern the processes that are used today (in the last decades of strong modernization of agriculture) in conventional production. Global interest in organic agriculture is growing, especially in areas where the conventional farming system has degraded resources essential to agricultural production (Šeremešić et al., 2021). The issue of sustainable development collides with the issues of intensive land cultivation, application of mineral fertilizers, chemical control of weeds, pests and diseases and GMO issues, animal welfare issues, health issues and the like (Tomaš Simin et al., 2019). Organic production as an alternative production system, categorizes as sustainable agriculture with different environmental approaches, could be useful in conservation of biodiversity (Jevtić et al., 2020). Also, organic farming represents a comprehensive system of farm management and food production that protects environment, preserves biodiversity and natural resources (Roljević et al., 2017). The sustainability of organic production is reflected in the rational use of natural resources, without exhausting, but rather through maintaining and increasing their diversity, leaving no negative impacts on the environment (Roljević et al., 2017). The best alternative for further expansion and development of organic agriculture is its integration into a global strategic framework such as the SDG as to connect various aspects of sustainable agriculture and stakeholders and to secure a pivotal position in healthy and safe food production while protecting the environment (Šeremešić et al., 2021). Consumers also play an important role in creating a sustainable food production system. Through demand, they send a strong message to manufacturers, sellers, and other supply chain actors about what is important to them (Stojić and Dimitrijević, 2020).

The market for organic products has grown significantly since 2008 when melamine was found in baby food and dairy products. According to Lernoud and Willer (2017), the five countries with the highest percentage of participation in the value of the organic market were singled out: Denmark with 8.4%, Switzerland with 7.7%, Luxembourg with 7.5% and Sweden with 7.3%. Since then, the demand for these products of organic origin has increased significantly (Sahota, 2017). Also, contemporary research has concluded that under certain conditions, especially in developing countries, organic agriculture can be more productive compared to conventional production and that it can respond to the challenge of malnutrition in developing countries (Issaka et al., 2016).

By considering the existing situation in the environment, the concern of modern consumers for their own health and quality of life was recognized, and an effort was made to adopt the appropriate product with environmental component. Over time, marketing

has developed around the world that aims to promote products and services whose production and use respects the concept of sustainable development and environmental protection. Today, the so-called environmental marketing can be defined as "a process that is responsible for identifying, anticipating and meeting the needs of consumers and society in a profitable and sustainable way". "Environmentally friendly", "green marketing", "eco marketing", "environmental marketing" or "sustainable marketing", are synonyms for marketing that refers to consumer satisfaction, their needs, desires, aspirations combined with care for the environment (Peattie and Crane, 2005, Shabbir et al., 2020). This definition contains the traditional components of the definition of marketing (consumer satisfaction), but it also includes environmental protection, in a way that minimizes the harmful impact on the environment. On the other hand, on the side of producers, the quality of products becomes the key factor of domestic and international competitiveness. Today, in the time of available information, developed financial market, widespread transfer of technology, labour mobility, sophisticated and spoiled customers, non-material components of competitive advantage sources become more important. In a globalized competitive environment quality is an essential element of business strategy, or even closer, product differentiation strategies (Glavaš-Trbić & Maksimović, 2013).

Consumption of organic agri-food products is based on public awareness of the growing pressures of environmental problems. It is believed that this fact, with the introduction of strategies to stimulate purchases, i.e. consumption of organic products in people's lifestyles will contribute to higher profits of economic entities. Eco marketing does not have the same impact on all consumers. Therefore, it is necessary to identify target markets and to focus the promotion on defined target groups that are "concerned" about their health and the environment (Chekima et al., 2019, Hansmann et al., 2020). Green marketing offers the opportunity for people to engage and promote "green" lifestyles. On the other hand, there is an opportunity to innovate in providing business solutions and make a profit and at the same time build consumer confidence in the company (or household) (Grant, 2007, Feila et al., 2020).

In the Federal Republic of Yugoslavia in 2000, the first law on organic agriculture was passed („Official Gazette of the FRY", No. 28/2000). In 2006, the Law on Organic Agriculture of the Republic of Serbia was passed, when the national sign for marking certified organic products was adopted. In accordance with the new EU regulations in this area, in 2010 the Law on Organic Agriculture was adopted in Serbia („Official Gazette of the RS", No. 30/2010) and this law was prepared in accordance with the new EU regulations in this area. This law regulates the production of agricultural and other products by organic production methods, goals and principles of organic production, control and certification in organic production, processing, labeling, storage, transport, trade, import and export of organic products, as well as other issues of importance for organic production.

Market research of organic products, especially in the context of consumer motives for buying both products is important because, among other things, understanding consumer

motives and acting on the market in that direction consistently leads to further development of the market and economic benefits associated with it. According to the findings of previous research (Vehapi, 2014; Vlahović and Šojić 2016, Radojević et al., 2020, Radojević et al., 2021), the basic characteristics of the domestic market of organic products are insufficiently aware and informed consumers, on the one hand, and insufficiently wide range, quantity of products and consistency in supply, on the other hand. The market of organic food products is characterized mainly by low purchasing power of the population, insufficient consumer information and low environmental awareness of Serbian population.

For the purposes of this paper goal, consumer habits, opinions, motives, experiences and attitudes regarding the consumption of organic agri-food products in the Republic of Serbia were investigated. The paper highlights some of the important characteristics that help consumers when making a decision to buy a food product, in order to highlight the characteristics that should be emphasized in organic products in order to improve their sales. The contribution of this paper is to understand the attitudes and habits of consumers of these food products in the Republic of Serbia in order to analyze the possibilities of improving this market of organic products as a whole. Only with an understanding of the most important factors for the improvement of production, marketing and consumption of organic products in the Republic of Serbia, it will be possible to get closer in practice to achieving this goal.

Materials and methods

Empirical research of the organic products market consisted of collecting data by means of a survey, through a questionnaire using the face-to-face technique, where the interviewers asked questions to the respondents. Most of the data was collected in person in conversations with respondents, partly in health food stores, markets, and partly in front of larger retail chains.

The research was conducted in 2016 in Novi Sad and Belgrade. The sample consisted of 496 respondents, older than 18 years, different levels of education, marital status and other socio-demographic characteristics.

The questionnaire created for this research largely used the experiences of researchers from other countries of Great Britain, Denmark, Germany, USA; Croatia, Italy, Switzerland, Sweden, Australia, but also others (Hendrik et al.,1998; Pinton, 1999; Carboni et al., 2000; Fotopoulos et al., 1999; Torjusen et al., 2001; Hallam, 2002; Magnussona et al., 2003; Lockie et al., 2004,; Wier et al., 2008; Tsakiridou et al., 2008; Ness et al., 2010; Stolz et al., 2011; Nie and Zepeda, 2011). Papers published in relevant world scientific journals were mostly used.

The general part of the questionnaire consists of questions related to the socio-demographic characteristics of respondents who participated in the survey, such as gender, age, marital status, number of children, number of household members, level of education, occupation, employment status and other characteristics that should give a closer picture of the respondents who make up the sample in this empirical study.

The obtained data were processed using descriptive statistics. Collected socio-demographic data on respondents from the sample (gender, age, education, marital and employment status, number of household members, occupation, and monthly household income) were crossed with all questions from the questionnaire. The paper presents and interprets statistically significant relationships that exist and are relevant to the goal of the research.

The questionnaire consisted of 18 (groups) of questions related to the attitudes of respondents regarding the factors that influence their decision when buying food products as well as the most important characteristics of food products.

The first group of questions in the questionnaire is related to general factors that influence the purchase of food products. The following is an excerpt from the questionnaire used. The paper presents an analysis of the first group of questions in order to answer the research question: what influences the consumer decision when buying food products.

Table 1. The first group of question in the questionnaire

Question: On a scale of 1 to 5, evaluate how much the following factors generally influence your decision when buying food						
1	Product quality.	1	2	3	4	5
2	Origin of produce (imported or domestic).	1	2	3	4	5
3	Attractive packaging.	1	2	3	4	5
4	The product does not contain additives and harmful substances ("healthy food").	1	2	3	4	5
5	Clearly stated expiration date.	1	2	3	4	5
6	Good price.	1	2	3	4	5
7	Recommendation (friends, experts, nutritionists, doctors).	1	2	3	4	5
8	The product is advertised.	1	2	3	4	5
9	Well-known manufacturer.	1	2	3	4	5
10	Clearly written composition on the packaging.	1	2	3	4	5
11	Pleasant ambience in which the product is sold (specially decorated corner).	1	2	3	4	5
12	The product looks nice.	1	2	3	4	5
13	Ecological (bio) product (does not endanger the environment).	1	2	3	4	5
14	Best value for money.	1	2	3	4	5

Source: author's research

Respondents assessed the degree of agreement with the statements on a five-point Likert scale, with number one expressing complete disagreement, and number five completely agreeing with the stated statement, i.e. attitude (1 - none; 2 - a bit; 3 - moderately; 4 – a lot; 5 - very much).

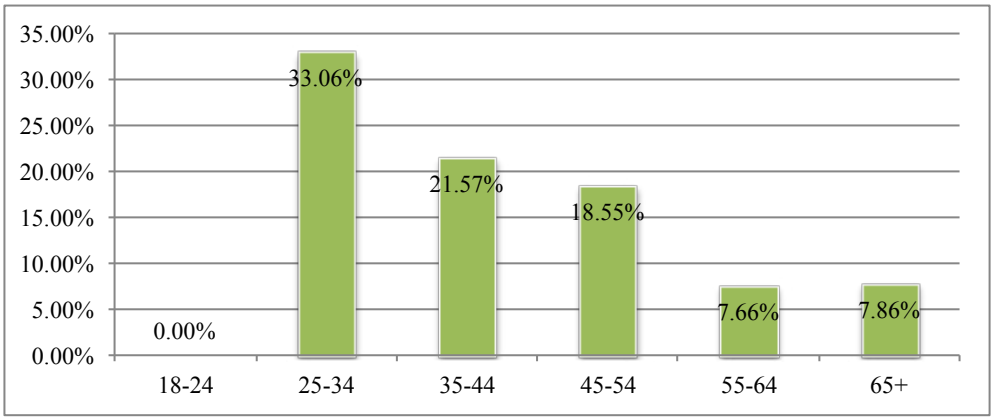
From the statistical methods of analysis of the data obtained through the questionnaire, descriptive statistics were use and the method of correlation analysis was applied in order to test the relationship between individual variables. The results of the analysis are presented in the form of graphs and tables. The SPSS 20 software package was used for statistical data processing.

Results and Discussions

A total of 496 respondents from Novi Sad and Belgrade participated in the empirical research of the organic food products market. According to the semi-analyzed data collected, it is indicated that an almost even distribution of male (50.51%) and female (49.4%) respondents was achieved in the sample.

According to the age, the respondents were divided into intervals (Figure 1) and a more significant participation of the respondents in the category 25 to 34 years (33.06%), i.e. in the category 35 to 44 years old (21.57%) can be seen.

Figure 1. Age structure of respondents



Source: author's research

In accordance with the basic characteristics, and of importance for purchasing power and decisions when buying, the marital status of the respondents who participated in the research was also examined (*Table 2*). The sample was dominated by married respondents (48%), i.e., unmarried (36.9%).

Table 2. Marital status of respondents

	Description	**Frequency**	**Percent %**
	Unmarried	183	36.9
Valid	Married	238	48.0
	Divorced	52	10.5
	Widow / widower	22	4.4
	Total	495	99.8
Not valid	Data is missing	1	0.2
Total		496	100.0

Source: author's research

Respondent education is one of the factors that has also been shown to be relevant in decisions regarding organic food products (*Table 3*). The same applies to the occupation of the respondents, although the typology of occupations is always a very complex and demanding research task due to the lack of a uniform typology of occupations in society as well as different approaches to this issue (*Table 4*).

Table 3. Education of respondents

	Description	Frequency	Percent %	Valid percent %
Valid	Primary school	12	2.4	2.5
	High School	263	53.0	54.2
	College	59	11.9	12.2
	Faculty	137	27.6	28.2
	Master's / PhD	14	2.8	2.9
	Total	485	97.8	100.0
Not valid	Data is missing	11	2.2	
Total		496	100.0	

Source: author's research

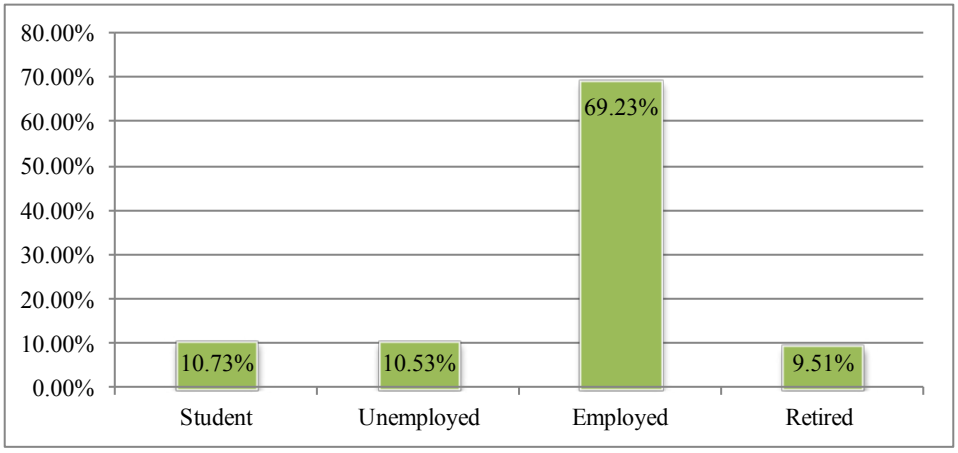
Table 4. Occupation of respondents

	Description	Frequency	Percent %	Valid percent %
Valid	Expert and artistic occupations	68	13.7	20.2
	Engineer, expert associate and technician	75	15.1	22.3
	Administrative officer	19	3.8	5.6
	Service and trade occupations	65	13.1	19.3
	Farmer	4	0.8	1.2
	Craftsmen and related occupations	34	6.9	10.1
	Driver	10	2.0	3.0
	Machine and plant operator	2	0.4	0.6
	Other occupations	60	12.1	17.8
	Total	337	67.9	100.0
Not valid	Data is missing	159	32.1	
Total		496	100.0	

Source: author's research

Considering the problems of research and the specifics of organic food products (where they are mainly aimed at their higher price and the possibility (mostly) of higher social strata to afford them), the working status of the respondents was of the greatest importance (Figure 2), but also their income (Figure 3).

Figure 2. Working status of respondents

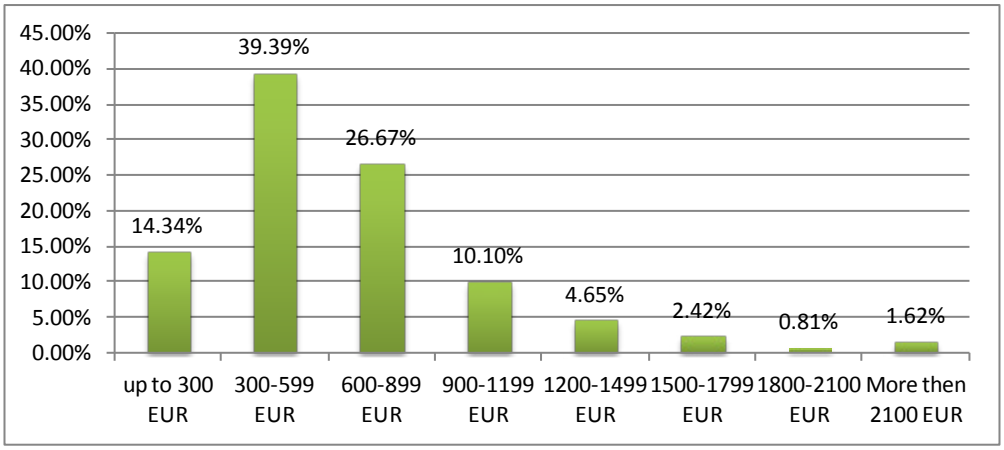


Source: author's research

The working status of the respondents in the sample showed the following: 10.7% of students, 10.5% of the unemployed, 69.2% of employees and 9.5% of pensioners.

The question regarding the income of the respondents (potential buyers and consumers of organic food products) is of great importance. Accordingly, the question of the total monthly income of the household in which the respondent lives was cautiously asked.

Figure 3. Total monthly household income of the respondents [6]



Source: author's research

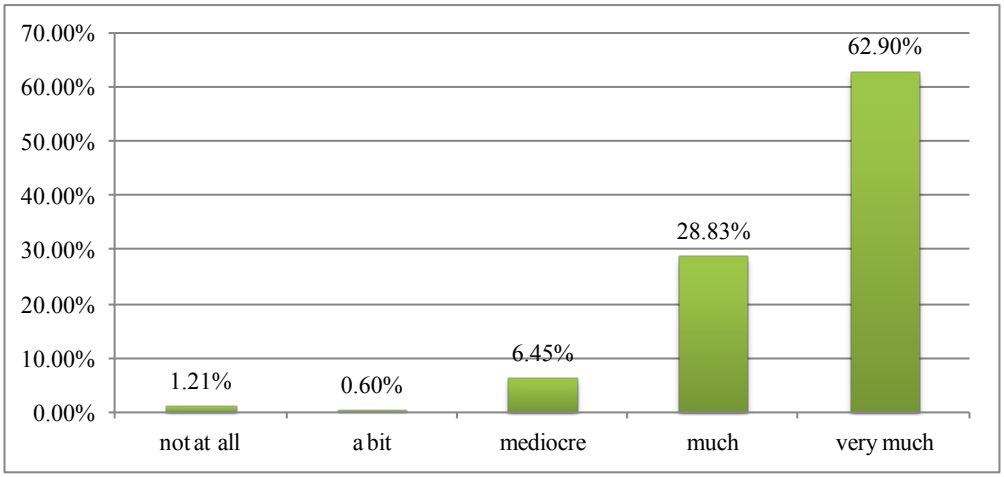
Relatively speaking, the largest share of respondents has a household income slightly higher than the minimum consumer basket, which at the beginning of 2016 (Feb. 2016), according to the competent Ministry of Trade, Tourism and Telecommunications,

6 Exchange rate 122.9333 dinars for 1 € (February 1, 2016)

amounted to about 35 thousand dinars. According to the same data, the value of average consumer basket for the same period is about 74 thousand dinars, which converted into EUR is slightly more than 600 EUR, which in the sample for household income corresponds to only 26.6% of respondents. If we look at all categories over the value of the consumer basket, we come to 46.1% of respondents in the sample, i.e., 53.6% of respondents below the income compared to the value of the average consumer basket.

After the basic indicators of the characteristics of the respondents that are important for drawing conclusions, the analysis of the first group of questions was approached. As expected, product quality is one of the most important factors when buying. As a factor that greatly influences the decision to purchase products (62.90%), it is significantly related to decisions to purchase organic food products because their quality is exactly what, as a rule, in the head of the average customer is a distinctive feature in relation to products from conventional production (Figure 4).

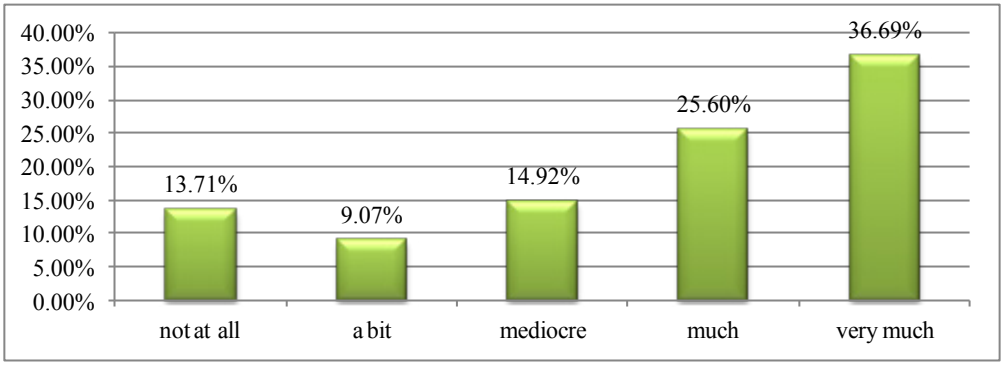
Figure 4. Influence of product quality when deciding to buy food products



Source: author's research

In addition to product quality, the assumption was that the origin of the product could also influence the purchase decision. The results of the research showed that the origin is important (Figure 5), but not as important in comparison with e.g. quality as a purchasing decision factor.

Figure 5. Influence of product origin when deciding to buy food products



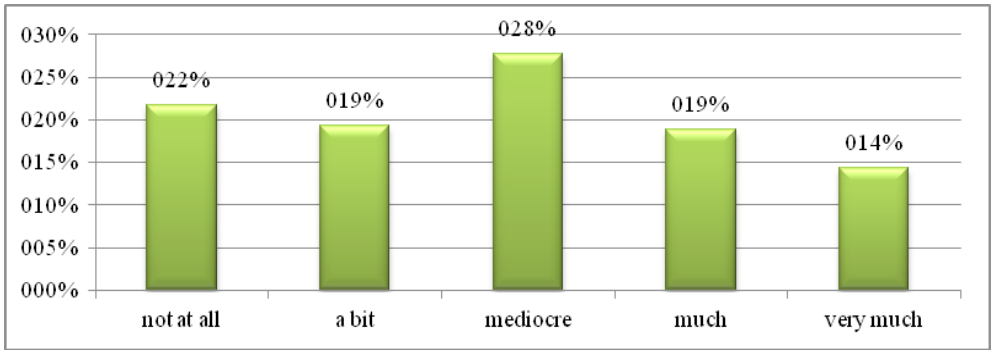
Source: author's research

The obtained results indicate that there is a statistically significant dependence of the marital status of the respondents and the attitude that foreign, imported food products are of better quality (p = 0.049). Unmarried respondents mostly agree that attractive product packaging influences the purchase decision (mean value 266.10), while widows and widowers least agree with this attitude (mean value 195.39).

Regarding the quality of food products, the analysis showed that the group of students from our sample mostly agrees with the attitude that foreign, imported food products are of better quality than domestic ones. Correlation analysis of the obtained answers showed that with increasing age, respondents less believe that foreign imported food products are of better quality (correlation coefficient r = - 0.144). At the same time, the correlation analysis showed that with the increase of monthly household income, the quality of the respondents plays a greater role in the purchase of products, although the correlation is of low intensity (correlation coefficient r = 0.082).

The assumption was also that attractive product packaging could attract customers. However, as Figure 6 shows for only about one third of the respondents, this is a factor that significantly influences the decision to purchase food products (Figure 6).

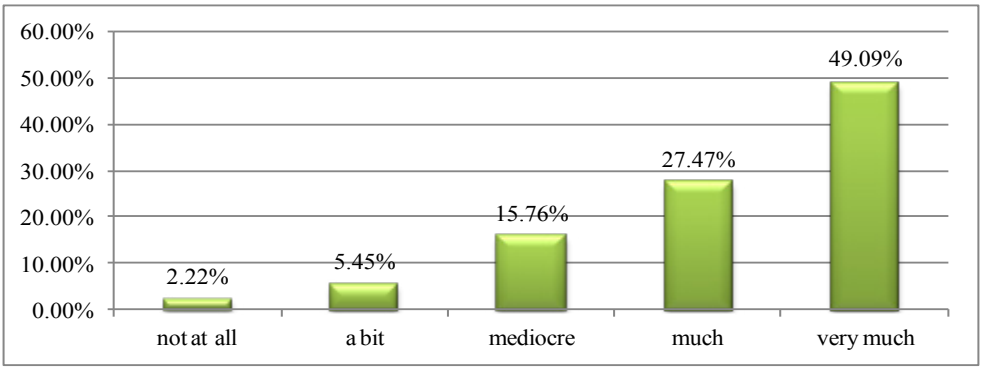
Figure 6. Influence of attractive product packaging when deciding on the purchase of food products



Source: author's research

Another factor whose impact was analyzed was the importance of knowing that the product does not contain additives and harmful substances ("healthy food"). As expected, this factor in a very high percentage influences the decision to buy a food product, in almost 50% of cases very much and almost 30% much (Figure 7).

Figure 7. The impact of the absence of additives and harmful substances in the product when deciding to purchase food products

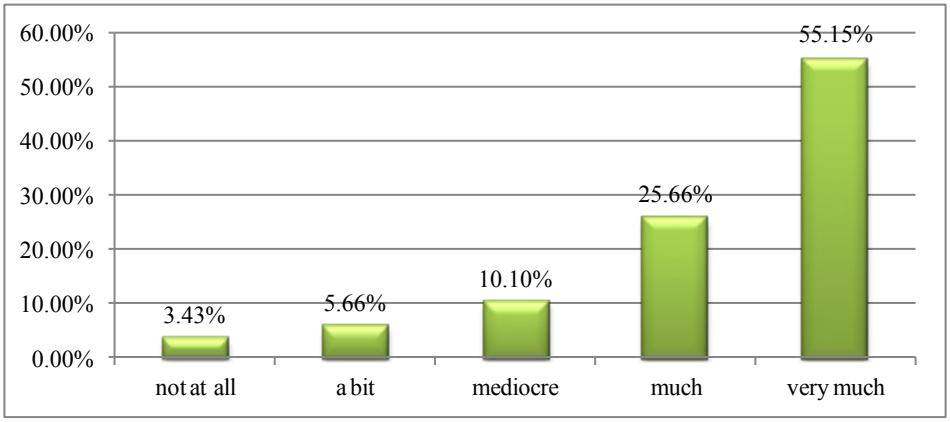


Source: author's research

Correlation analysis showed that with the increase in respondents earnings, the respondents efforts to be informed about healthy lifestyles increase, although the correlation is of low intensity (correlation coefficient r = 0.075), which is related to this question. The intersection of employment status and this question showed that pensioners are most affected by this factor when buying food, while students the least affected. Also, the analysis showed that there is a statistically significant dependence of the marital status of the respondents and the fact that the product does not contain additives and harmful substances as a factor influencing the decision when buying food products. Divorced respondents largely agree that the fact that the product does not contain additives and harmful substances influences the purchase decision, while unmarried respondents agree the least with this view.

The remaining shelf life of the product is also a factor that significantly affects the purchase because it is related to the price paid for the product and its use value, i.e. the period in which it can be consumed. Of course, this is related to health, but also to shopping habits (e.g. "large purchases" for a longer period of time, where the shelf life is, let's say, important). In this sense, almost 80% of respondents consider this factor very important (Figure 8). Correlation analysis showed that with the increase of respondents' earnings, the importance of this factor in the purchase of food products also increases, although the correlation is of low intensity (correlation coefficient r = 0.081). Also, the older the respondents, the greater the influence of this factor when buying food products (correlation coefficient r = 0.141). The analysis of the data showed that the shelf life of the product is a factor that is more important for women than men when buying food products.

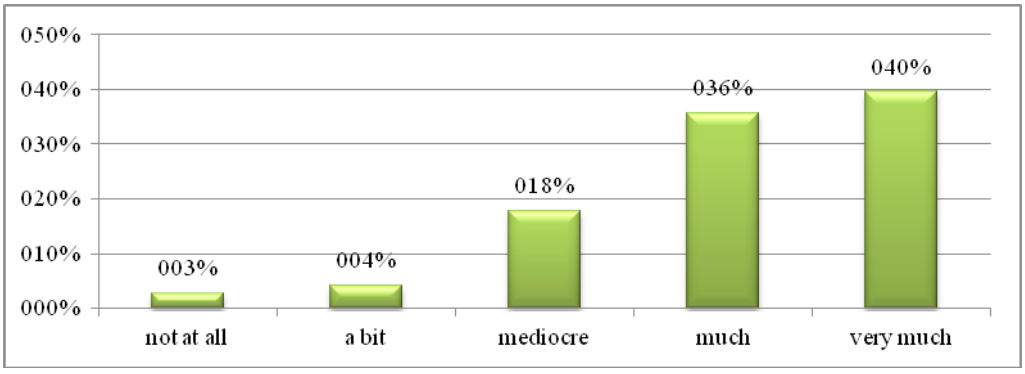
Figure 8. Influence of product shelf life when deciding to buy food products



Source: author's research

It is completely expected that the price at which a product is sold is one of the most important factors influencing the purchase of individual products (Figure 9). This is even more pronounced in an impoverished society like the Serbian one, in which many customers can hardly achieve an amount equivalent to the value of the consumer basket through household income. As expected, the impact of the price is very high (collectively much and very much at the level of about 75%). Correlation analysis showed that in respondents with higher incomes, prices have less influence when buying food products (correlation coefficient r = -0.197). The analysis showed that the price of food products has a greater impact on female respondents, as well as pensioners. Also, with a higher level of education, respondents are less and less affected by the price of the product. There was no statistically significant relationship between (favorable) product prices and the age of the respondents.

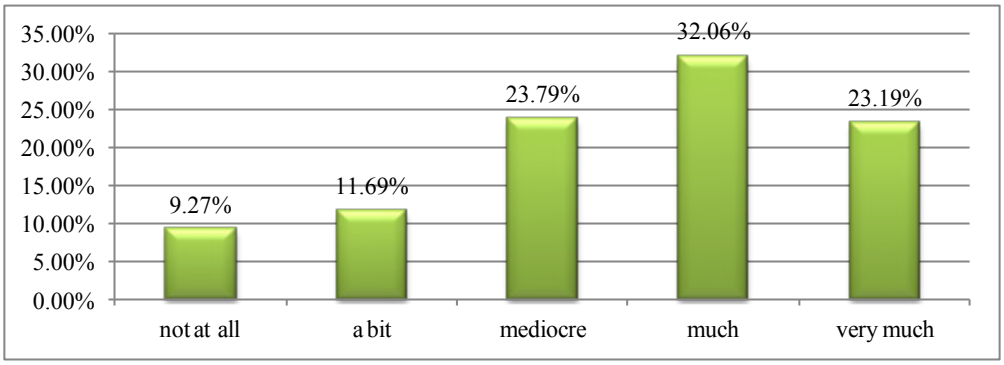
Figure 9. Influence of favorable product price when deciding on the purchase of food products



Source: author's research

In relation to the previous factor, the recommendations of friends, experts, nutritionists, doctors, etc. significantly less influence the purchase decision (Figure 10). Only 23% of respondents believe that such an impact in the domain is very much, a similar percentage that the impact is mediocre. 32% of respondents are in the category of "much influences". Correlation analysis showed that with increasing age, the influence of this factor increases when buying food products (correlation coefficient r = 0.145).

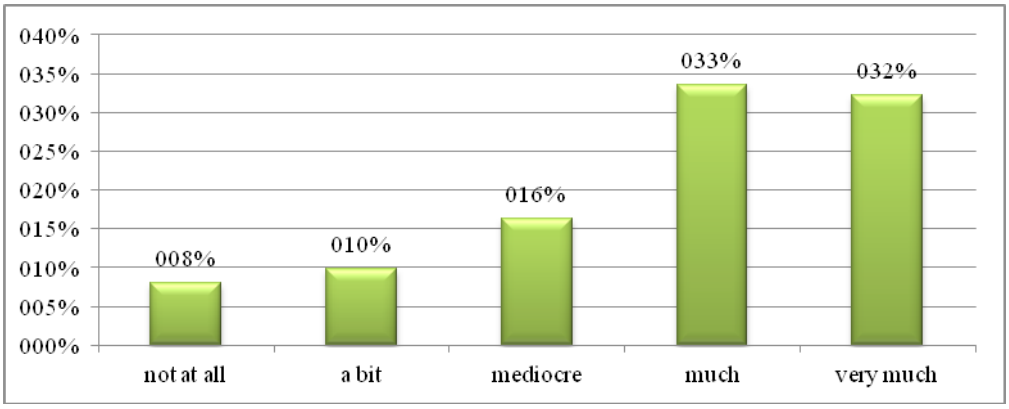
Figure 10. Influence of recommendations when deciding on the purchase of food products



Source: author's research

One of the isolated factors whose influence we wanted to investigate is the written composition of the product on the packaging. Although consumers often do not read the composition of the product written on the packaging, the respondents are of the opinion that this is also a significant factor when buying. A total of 65.73% of respondents from the analyzed sample thought that this was a very important factor influencing the purchase of food (Figure 11).

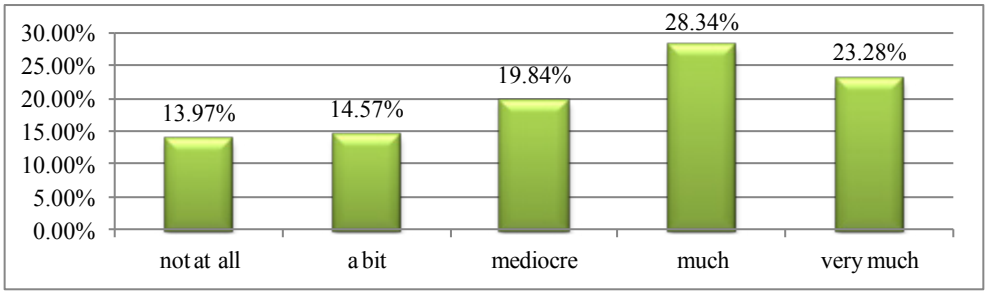
Figure 11. Influence of the factor "clearly written composition on the packaging" when deciding on the purchase of food products



Source: author's research

When selling food products, as well as organic ones, often, among other factors, the specific ambience, promotions, tastings for consumers, etc. are important. Usually such actions are taken within larger markets. For organic products, the so-called organic corner, which has a specific ambience and seeks to distinguish this segment of products and clearly indicate their distinctive characteristics in relation to other products from the shelves. The responses of about half of the respondents showed that this environment has an impact, although, relatively observed, not as much as other factors already mentioned (Figure 12).

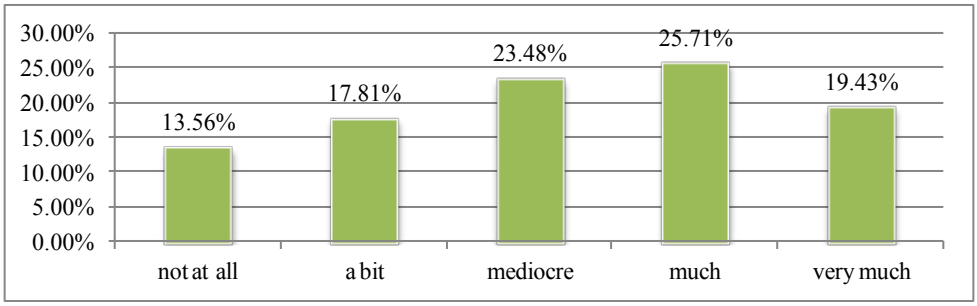
Figure 12. Influence of "pleasant ambience" when deciding on the purchase of food products



Source: author's research

The next factor that was researched is important because of the connection with the basic subject of research, and that is the organic food product. The assumption of consumer awareness is that the "ecological (bio)" product does not endanger the environment. Somehow, as expected (for our society and the consciousness of consumers and citizens as a whole), this factor did not prove (compared to others) to be of great importance. Less than half of the respondents (45%) rated this factor as much, that is, very much important when making a purchase decision (Figure 13). No statistically significant correlations were shown between this factor and other variables.

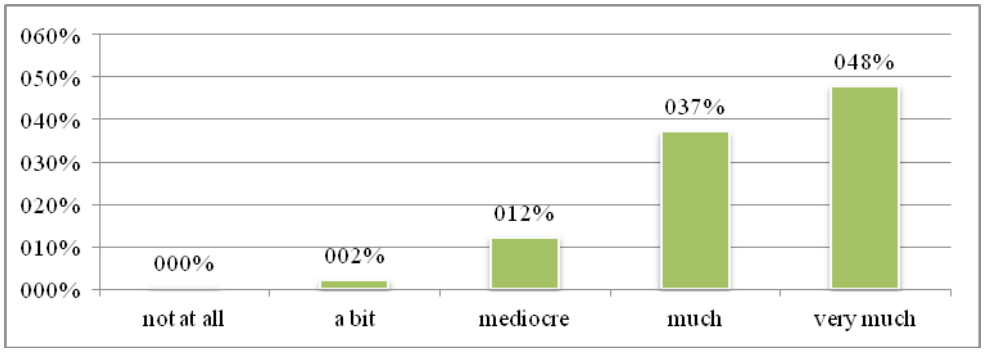
Figure 13. Impact of "ecological (bio) product" when deciding on the purchase of food products



Source: author's research

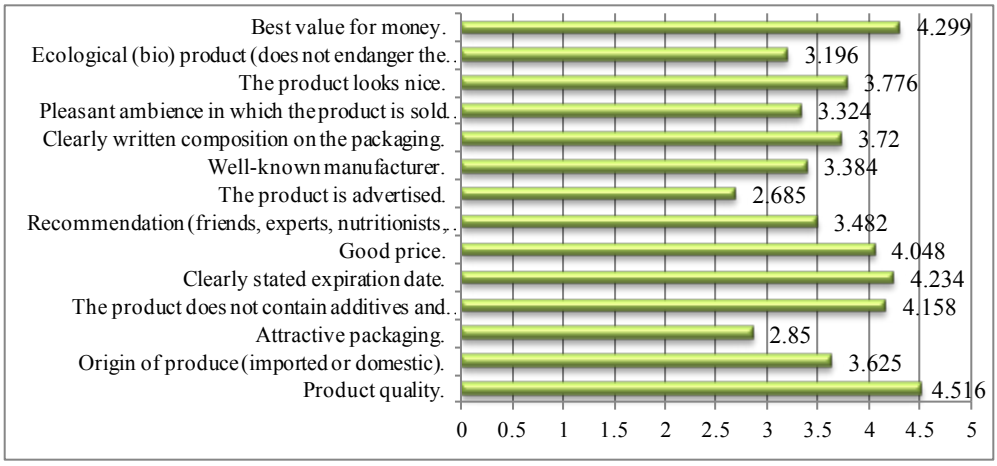
The last factor that was analyzed, as expected, turned out to have almost the most influence on the purchase decision. It is a factor of the mutual relationship between the price and the quality of the food product that is being bought. This factor is among the first three that have the greatest impact on the purchase of food (in addition to quality and shelf life) and, collectively, 85% of respondents from the analyzed sample rated it as much, that is, very much important (Figure 14). Correlation analysis showed that in subjects with higher incomes, the influence of this factor decreases, although the correlation is of low intensity (correlation coefficient r = -0.087).

Figure 14. Influence of "best value for money" when deciding on the purchase of food products



Source: author's research

Figure 15. Presentation of the mean values of the analyzed factors when deciding on the purchase of food products



Source: author's research

Since it was a scale from 1 to 5, average values were calculated for each of the presented factors and these average values perhaps best speak of the relationship and influence of the analyzed factors on the decision when buying food products Figure 15.

Conclusions

The organic system of agricultural production has become increasingly important in recent decades. One of the often cited reasons is the adverse impact of conventional production on the environment and consumer health. Among the motives for entering the organic system, economic reasons occupy a significant place. Knowledge of the market of organic products contributes to the achievement of positive financial results of agricultural producers, which in turn leads to the growth of this market with the entry of a larger number of producers in this system. Green or eco marketing is focused on researching sustainable and profitable production systems, which includes the system of organic agriculture.

The research was conducted on consumers of food products with the aim to determine the characteristics that can lead to higher consumption of organic products. The research showed that a healthy, quality product, which has no additives and harmful substances and has the best price-quality ratio with a clearly stated shelf life, are the basic factors for buying food products, i.e. the factors that most influence a positive purchase decision. The average values of these characteristics: quality, best price-quality ratio, clearly indicated shelf life, the product does not contain additives and harmful substances are respectively 4,516; 4,299; 4,234; 4,158 on a scale of 1 to 5 clearly indicate their importance when making a decision to purchase food products.

The limitation of this study is related to the convenient sample, which has its limitation and the limited geographical area. It is reflected in the fact that only the markets of Belgrade and Novi Sad are covered. Although these are currently the largest and most significant domestic markets for organic products, further research should go in the direction of determining the possibilities of developing this market in smaller urban and rural areas. This indicates importance of eco-marketing, which should emphasize these characteristics of products in order to increase their consumption, of course, having in mind the purchasing power of different segments of the population. The research showed that the quality of the product, the origin, the recommendation, the fact that the manufacturer is known and that the product is "environmentally friendly" mostly affect the respondents who have a predisposition to buy organic products. By understanding these most important factors for improving the production, marketing and consumption of organic products in the Republic of Serbia, it is possible to improve and further develop this market.

Acknowledgements

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Conflict of interests

The authors declare no conflict of interest.

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WINE AS AGRICULTURAL AND FOOD PRODUCT: A HISTORICAL AND COMPARATIVE LEGAL APPROACH

Aleksandra Jovanovic[1], Aneta Atanasovska Cvetković[2]

**Corresponding author E-mail: a.atanasovska@yahoo.com*

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ABSTRACT

Wine is not just a product of modern times. Wine, one of the oldest drinks in the world, was sold and inherited by ancient civilizations. Its importance is indicated by the regulation of wine in the Codes of ancient Mesopotamia and Roman law. Today, this agri-food product is sold on both the domestic and foreign markets, and it is indisputable that the production and sale of this product must be legally regulated. The authors of this paper, by analyzing the legal provisions of Roman law, the Law on Wine and the Criminal Code of Republic of Serbia, point out the importance of the existence and expansion of legal provisions related to wine and its producers and precise criminal law provisions in case of sale of wine produced contrary to legal regulations and contrary to the health of people who consumed the same. The stated purpose of the paper, in order to draw a conclusion about the importance of specifying legal provisions, was achieved by presenting the historical and positive legal regulation, using the historical method and comparative analysis.

Introduction

A well know saying about wine as "a blissful drop – a gift from Gods", has been perpetuated for a long time, long before the birth of civilization, and long before Jesus offering wine filled Holy Grail at the Last Supper urging for a "drink of his blood", and long before the Slavs inhabited the Balkans.

Common grape vine appeared on the planet Earth long before man (Avramov, 1975). Records corroborating this fact can be found in the literature referring to grape vine and

1 Aleksandra Jovanović, PhD., Associate professor, Faculty of Law, Security and Management „Constantin the Great ", University Union – Nikola Tesla, Niš, Serbia, Phone: +381 63 8 324 081, E-mail: aleksandra.aj17@gmail.com, ORCiD ID: (https://orcid.org/0000-0003-1062-3351)

2 Aneta Atanasovska Cvetković, PhD., Assistant professor, Faculty of Law, Security and Management „Constantin the Great ", University Union – Nikola Tesla, Niš, Serbia, Phone: +381 64 9 128 946, E-mail: a.atanasovska@yahoo.com, ORCiD ID: (https://orcid.org/0000-0002-4489-5040)

its first appearance, claiming that first grape vine that appeared even before first man was the wild grape vine *Vitis vinifera* (Mijatović, Jovanović, 2014). Common grape vine is also mentioned in the Bible[3], and scientists believe that wines made from raw fruits were not unknown to man of the ancient times.

Also, the first forms of trade and punishment known to man, the first natural, commodity exchanges of the ancient civilizations were made through wine and grain. The Great Hammurabi (Stanimirović, 2011) and its Code[4] provide penalties in the part related to wine and taverns. Apart from enjoying wine the pharaohs also enjoyed growing wine along the great river Nile, and the great Greek poet Homer wrote about good wines from Greece and Macedonia. All this above mentioned clarifies that the oldest languages in the world contained words for wine, grapes and vines.

The Great Roman Empire is considered to be the "culprit" for the expansion of common grape vine and wine in our region, on the Balkan Peninsula, and the immigrating Slavs accepted the way of growing vines and making wine (Hristov, 2010).

The Middle Ages could be characterized as significant for expanding the cultivation of wines and making wine. Thanks to priests and monasteries, common grape vine and wine were gaining in importance on the Balkan Peninsula. This expansion, however, was interrupted by the Turks invading the territory of the Balkan Peninsula and their religious believes forbidding the use of alcohol (Hristov, 2010).

The 18th and 19th century mark ups and downs in the development of common grape vine and wine. Namely, history recognizes the expansion of grapevine and wine cultivation in the 18th century on the European continent, but the 19th century highlights a decadence of that development. Historical facts show that in the 19th century, in 1864, grapevine disease[5] was transmitted from America causing a destruction of a large number of seedlings. Thus, it was even believed that certain varieties of grapes and vines were destroyed forever. However, on the soil of Europe, the application of chemicals for the eradication of diseases was introduced, and in this manner the common grape vine was saved and had re-experienced its spread and development (Avramov, 1975).

Today, the Republic of Serbia, with its regions[6] where grapes and vines are grown, is considered to be one of the countries with a long tradition of wine and grape vines cultivation, both family and industry based. The family and industrial tradition of wine

3 The Holy Bible, The Old Testament, Genesis, Chapter 9, 9:21 And Noah began to be a husbandman, and he planted a vineyard; 9:22 And he drank of the wine, and was drunken; and he was uncovered within his tent.

4 Art. 108.: If a wine seller does not take grain for the price of a drink but takes money by the large weight, or if she makes the measure of drink smaller than the measure of grain, they shall call that wine seller to account and throw her into the water.

5 Phylloxera (Phylloxera vastatrix, Dactylosphera vitifolii, Phylloxera vitifolii)

6 Ordinance on the regionalization of wine-growing geographical production areas (Article 3, "Official Gazette of the RS", No. 45 of 22 May, 2015)

production and its sale is regulated by legal provisions that do allow the production and sale of this agri-food product, which is the subject of this paper.

Materials and methods

In order to reach objective results, the historical method and comparative analysis were used. The main source of data used in this paper are legal regulations: regulations of Roman law and contemporary law of the Republic of Serbia with reference to the regulations of the surrounding countries. For the purposes of this paper, the Law will be observed from the aspect of wine, wine producers and penal provisions related to the production and trade of wine.

The main purpose of this paper is to point out the need for precise legal provisions related to wine and its producers, criminal legal provisions in the case of the sale of wine produced contrary to the legal regulations. The ultimate purpose is to prevent the occurrence of harmful consequences for the health of people who consumed this agri-food product which was produced with a flaw or inaccuracy. This indicates that the analysis in the paper is based on the following hypotheses: wine is an important agricultural and food product since the oldest civilization, there is a need for more precise determination of certain provisions of the Law on Wine and sanctioning activities that inadvertently cause harmful consequences for humans and the environment.

The sale of wine in Roman law

One of the aims of this paper is a segmented presentation of wine in the Roman law. It is termed segmented because the way of selling wine and inheriting it in the Roman law will be shown in small-scale range. It is an indisputable fact that the Romans, in their characteristic manner of strong developed legal awareness and logic, and having in mind the fact that one of the basic trade products was wine, made sure that it had a place in the Digests (Pandects).[7] When it comes to the sale of wine in Roman law, there are no books or titles dealing especially with the sale of wine in the Digests. However, if we read carefully Book 18 of the Digest[8] entitled "Concerning the contract of purchase and agreements between purchaser and vendor, and what things cannot become the objects of the same", we will be noticing texts referring precisely to the wine and its sales.

Before elaborating on the sale of wine, we must point out the fact that the contract of sale (*emptio venditio*) (Maksimović, Despotović, 2017) is one of the most important and significant contracts in the Roman law (Atanasovska Cvetković, 2021). It belongs to the group of consensual contracts with its own characteristics. Thus, the characteristics

7 Digests (pandects) are part of Justinian's codification - Corpus iuris civilis. Namely, this great codification, which was carried out by order of Emperor Justinian I (526-565) contains three legal codes: Codex, Digests and Institutions. Finally, in Middle Ages Novellae are appended to Corpus Iuris Civilis which represented the new imperial regulations that were not included in the codification during the reign of Emperor Justinian I.

8 Hereinafter: D.18

of this contract are: for its conclusion, the simple consent, the will of the contracting parties is sufficient; the object of the contract is the subject being sold and its price; bilaterally - an equally binding contract where each contracting party appears both as a creditor and as a debtor (Ignjatović, Šutova, 2013) with the *bona fide* characteristics of the contract itself (Bujuklić, 2015).

The specificity of Roman law related to wine and its sale is that wine as a subject of sale is closely related to its measure (Bělovski, 2019). Therefore, if the wine was sold in separate amphora (*amphorae* [9]), the price was determined separately for each amphora. Hence, it could be said that the contract on the purchase of wine was concluded when the price was agreed on or, better said, when the price was determined for each amphora separately, and the subject of the contract was, of course, the wine. It is interesting to note that if the wine was sold in casks and vessels, it had to be sealed to prevent the wine from losing the quality. (D. 18.1.35.5)

Apart from amphorae, wine could also be sold in today's language phrased, "in bulk". Accordingly, the great Roman legal minds foresaw such a sale as well. In Digests, Book 18, titles 35, 6, Guy prescribed that if wine was sold from a wine cellar in 100 measures, the risk of sale would be on the seller as a contracting party, regardless of whether the price as the object of the contract had already been determined and fixed for all 100 measures, as a whole, or the price was determined for each measure individually. Guy anticipated the risk in the measurement in terms of whether as many measures were actually sold as agreed. In accordance with Book D.18.6.1, when it comes to measuring wine in bulk, the seller had the responsibility to keep the wine until it was measured. However, if the seller set a specific date for measuring the wine and that date was not respected, the seller had the right to pour out the wine. This pouring was to be carried out in the presence of witnesses, and the buyer was to be informed that the seller intended to do so. (D .18.6.1.3)

The Roman law, when it comes to the sale of wine, offers another specificity. The wine had to be tasted before it was sold, that is, a wine-tasting had to be performed (D .18.6.4 pr.). Although this title relates to the seller's risk if the wine was not tasted at a certain time, and the sale was conditioned by the deadline, one thing was assured: the amazing Roman lawyers took care of the quality of the wine that was sold, and the buyer was given an opportunity to perform wine-testing as to be convinced of the quality of the wine. In that line, Book D.18.6.4.1. states that it was quite unusual for someone to buy wine without wine-tasting, especially in case of "wholesale" purchase.

Additionally, the Roman law also stipulates that the seller has to take into account the condition or, better said, the quality of the wine when selling the wine. Under the "condition" or "quality" of wine, the Roman law took into account wine's acidity and

9 Under the Roman law, wine was kept in *vasa vinaria*. *Vasa vinaria*, in papers dedicated to wine, is a generic term, thus in Latin translations and terms dedicated to vessels in which wine was stored following terms can be distinguished: amphorae (*amphorae*), barrels (*dolia*) – tankers, jars (*cadi*), urns (*urnae*), barrels (*cuppae*). (Aličić, 2017)

moldiness. Therefore, the wine seller was not allowed to permit the wine to turn sour or moldy. In such a sale, only the Roman law gave preference to the buyer. This meant that the buyer could not buy such wine, and the seller was forbidden to sell the wine in that condition. (D.18.6.6.) On the other hand, the Roman law protected the seller. Thus, if the wine became sour or moldy after the sale, the buyer would suffer the consequences of such damage. (D.18.6.1.pr.)

Finally, when we talk about the sale of wine in the Roman law, it also foresaw the break of the amphorae, or the vessels in which the wine was stored. Of course, it was indisputable that by breaking amphorae, wine was poured out. The Roman law in this case indicates that if the sale was made, then the responsibility for breaking up the vessels, or amphorae bear the buyer, not the seller. (D.18.6.1.pr.)

Although the sale of wine in the Roman law deserves special elaboration in a special scientific paper, concerning only these few segments presented, we are of the opinion that the Roman legal minds fully took into account the sale of the "blissful gift of Gods".

The legal analysis of Serbian wine regulations

With the increase of production capacities, especially private sector based, the tendency of this activity is more than obvious - higher growth, development and marketing of this product, both on domestic and world market.[10]The Law on Wine[11] ("Official Gazette of the RS" No. 41/2009 and 93/2012) is a successor to the Law on Wine and Brandy ("Official Gazette of the RS", No. 70/94, 13/02-SUS and 101/05 - other law) which regulates wine in the Republic of Serbia and contains 73 articles. With this Law, the legislator regulates in more detail the production, processing and quality of wine (Art. 1, Law on Wine). It is an indisputable fact that the production of good wine requires grapes must and crushed fruit, so the legislator regulates the production, processing and quality of grapes, must and crushed fruit with this law. For the purpose of this paper, the Law will be observed from the aspect of wine, wine producers and penal provisions related to the production and trade of wine.

Since the Republic of Serbia aspires to be promoted in the world, among other things, by the placement of wine, the legislator took care that the produced wine meets the norms and qualities, both in terms of production, packaging and declaration (Art. 2, Law on Wine). In no case is the production of wine directly from native hybrids and nurseries (parent plant) allowed, and the use of sugar, brandy, ethanol and all those means that can increase the amount, and change the natural ingredients of wine are prohibited (Art. 3, Law on Wine).

It has already been mentioned that wine is considered an agricultural and food product. The Republic of Serbia Law on Wine gives an accurate definition of wine, so the legislator says: "Wine is an agricultural and food product obtained by complete or

10 Wine export to the Russian market, the EU market and the CEFTA area is increasing.

11 Hereinafter: Law

partial alcoholic fermentation of fresh grapes, must and crushed fruits from grape varieties"(Art. 5, Law on Wine). Such a definition is contained in the Law on Wine of the Republic of Srpska (Art. 3, Official Gazette of the Republic of Srpska, No. 80/2015) and the Law on Wine of the Federation of Bosnia and Herzegovina (Art. 2, "Official Gazette of the FBiH", No. 55/2012). The Law on Wine of the Republic of Croatia (Art.3, "Official Gazette of the Republic of Croatia, No.32/19) determines the meaning of the term "wine" as a product of grapevine. The definition of wine as a product is also accepted in the Law on Wine of the Republic of North Macedonia (Art. 3, "Official Gazette of the Republic of North Macedonia" No. 235/2019) and the Law on Wine of Bulgaria (Art. 2, Law on Wine and Spirits DV. No. 45/2012). It is obvious that wine is marked as a product in the laws, but the laws on wine of the Republic of Serbia and the Republic of Srpska define this product more closely and clearly, emphasizing two important conditions: that it is an agricultural product and it is intended for nutrition.

Throughout this paper, wine is mentioned as a product that should have its own quality and should be produced on the basis of set standards, so the question arises of the type of wines existing in the Republic of Serbia. The legislator gives the answer to this question dividing wine into three categories. Thus, in the Republic of Serbia, according to the Law, wine can be categorized as: still wine (*in strict sensu*), special wine, and wine for distillation (Art.7, p. 1, Law on Wine).[12] In this way, the legislator gives general indications and guidelines of what these types of wines mean and what producers should keep in mind when are producing such wines. On the other hand, the legislator leaves space for other detail normative regulation in other laws and regulations.

12 Still wine, in accordance with the Law, is any wine that does not release carbon dioxide. This wine must be produced on the basis of ecological procedures for the treatment of grapes, must and crushed fruits, with the usual fermentation (Art.7, p.2, Law on Wine). A special wine is a wine that is produced by specific, special oenological processes. It is believed that its characteristics do not originate only from grapes, but also from the applied special oenological procedures. (Ordinance on oenological practices and oenological products for the production of must, wine and other products - Official Gazette of RS 26 /15, 93/2015, 41/2017, 84/2018); (Art.7, p.3, Law on Wine). Hence, special wines, in accordance with the Law, are divided into: natural dessert wine, liqueur wine, aromatized wine, sparkling wine, quality sparkling wine, aromatized quality sparkling wine, sparkling wine, semi-sparkling wine, lightly sparkling wine and other special wines (Art.7, p.4, Law on Wine). When it comes to wine for distillation, it is more than clear that the legislator clearly says that this wine is intended for distillation (Art 7, p.5, Law on Wine). The legislator, wanting to fully express himself in the Law itself, talks about the categories of still wines. Thus, still wine, in accordance with the method of production and the type of wine area, is divided into: table wine and wine with geographical origin. Hence, the legislator classifies wine of geographical origin into: regional wine and quality wine with geographical origin (Art.8, p.2, Law on Wine). On the other hand, the legislator divides wine with geographical origin into: wine with controlled geographical origin, and quality and premium wine with controlled and guaranteed geographical origin and quality (Art.8, p.5, Law on Wine).

A wine producer, any legal entity or entrepreneur engaged in wine production, registered in the Wine Register (Art. 17, p.1, Law on Wine) should have facilities, premises, should fulfill concrete technical requirements, have appropriate storage and storage vessels[13],devices and equipment (Art.17, p.3, Law on Wine). With regard to the production process itself, the legislator by this Law, establishes a rule requiring the existence of professional staff with appropriate education and experience (Art.17, p.6, Law on Wine). It is from this rigorous legal norm that the legislator's awareness is visible: winemaking and wine are important branches of agriculture and economy that should include knowledge and quality in order for the wine to be placed on the market as a final (finished) product. Having in mind the above, the producer is obliged, by this Law, to use the prescribed oenological procedures and means that preserve the natural characteristics of wine. By defining the wine producer it is established the responsible person who, in case of non-compliance with legal provisions when placing wine on the market, knows the Law on Wine and the Criminal Code of the Republic of Serbia. The list of responsible persons should be expanded, so in the anticipation of the liability of persons, we think, should be also included: those who control the quality of wine, those who have inspection powers, the ones who placed wine on the market (and it is not wine producers but distributors) and legal entities that issue decisions on placing wine on the market.

The legislator, determining the conditions for placing wine on the market, explicitly states in Article 46 of this Law that wine may be offered to the consumer only in the original packaging and of the prescribed quality. We believe that a more precise and adequate legal solution is offered by the Law on Wine of the Republic of Croatia ("Official Gazette of the Republic of Croatia, No.32/19) by stipulating in section 8 "Placing on the market and conditions of sale of wine" Article 55, wine produced in Croatia, after the completion of the procedure of its finishing in accordance with the production technology and after the issuance of the decision on placing on the market. The provisions of this law, harmonized with the laws and regulations of the European Union, provide for administrative verification of mandatory declarations and other documents related to wine production by the Agency and verification of oenological practices in accordance with Article 4 of Commission Regulation (EC) no. 606/2009, with the prior approval of the Minister, thus the control of natural or legal persons wishing to conduct an oenological procedure is performed. Such a legal provision reduces the possibility of placing wine with a flaw or inaccuracy on the market, which automatically leads to a reduced possibility of committing offenses provided by the Law on Wine and criminal offenses specified in the Criminal Code of Republic of Serbia.

Also, we will pay attention to the penal provisions prescribed by the Law on Wine. The legislator divides the criminal provision into: economic misdemeanors, misdemeanors

13 Every wine producer should have special vessels and containers for storing table wine, for which production has not been used grapes originating from the Republic of Serbia. At the same time, every producer of wine should have adequate facilities for storing produced wine which was made from grapes originating from Republic of Serbia.

committed by a company, misdemeanors committed by an entrepreneur, misdemeanors committed by a natural person (Art. 64-68, Law on Wine). Fines (Stojanović, 2012) are envisaged for all these offenses and the prescribed amount ranges from 50,000 to 3,000,000 dinars, depending on whether the offense was committed by a natural person or a company, or other legal entity, and whether it is an economic offense.

An economic offense (economic misdemeanor) is punishable for a company, or other legal entity. The legislator lists in detail which actions will be considered as crime offense, and sanctions it with a fine in the amount of 300,000 - 3,000,000 dinars. An economic offense is considered to be illegal activities related to wine production, wine storage and inadequate production facilities, if there is no registration of producers in the Wine Register, lack of appropriate packaging, if the prescribed oenological procedures and oenological means are not used, if there is no appropriate packaging and wrapping of wine, etc.

The financial sanction is imposed on the one who produces wine using native hybrids and grapes from the nurseries (parent plants, mother plantations), which is prohibited by this Law. At the same time, any producer who uses sugar, ethanol, or brandy in the processes of wine production thus changing the natural ingredients of the must, is committing a procedure explicitly prohibited by this Act (Art. 64, p.1-2, Law on Wine).

Also, a financial sanction will be prescribed for an economic offense if the wine producer does not have adequate facilities, facilities not connected to the facilities producing distillate and, if there are no appropriate premises for the storage of oenological agents and raw materials. According to the law, the lack of appropriate containers for storing table wine not originating from the Republic of Serbia is punishable, as well as the lack of appropriate containers for wine produced from grape varieties grown in the Republic of Serbia (Art. 64, p. 3-4, Law on Wine).

It has already been mentioned that the use of oenological procedures and means in wine production not complying with the law, is not allowed, therefore, the legislator, if they are used, considers them as an economic crime, and fines them. Also, this law prohibits the addition of sugar and concentrated must in the production of wine with geographical origin, and the legislator fines this violation as well. It penalizes the production of wine of the geographical origin without a previously approved decree in which the wine is recognized as a mark with its geographical origin (Art. 64, p. 2, 7, 8, Law on Wine).

In some respect, the legislator also protects consumers, final consumers, so he penalizes any placing on the market of wine that is not original, is not of the prescribed quality, and does not have the appropriate packaging. In this regard, it is also punishable to place on the market a wine that has not been declared in the prescribed manner, and if a legal entity or a company, places on the market wine purchased in bulk, or wine needing further processing without any appropriate evidence to prove the quality of such wine, sanctions are also imposed by the legislator (Art. 64, p.18-19, Law on Wine).

As for the prescribed fines for the company, according to this Law, they range from 100,000 to 1,000,000 dinars (Art. 65, Law on Wine). Thus, a company will be financially sanctioned if it does not keep records and mark each wine-carrier with wine that is in bulk, and is intended for production, aging and storage (Art. 65, p. 6-7, Law on Wine). When wine storage and transport are mentioned, the legislator also imposes sanctions if wine is stored, sold and transported contrary to this Law (Art. 65, p. 16, Law on Wine). At the same time, the legislator will sanction the packaging and declaration of wine, if it is done contrary to the regulations, and if the wine of geographical origin is not marked with the appropriate record mark (Art. 65, p.11-12, Law on Wine).

In the area of legal entity, company misdemeanors, the legislator specifically protects final consumers. Thus, table wine that is offered to consumers in bulk, and is produced in the company's winery and from the grapes belonging to the winery, is sold outside of it. The same intention (protection of the final consumer) exists in the situation when the legislator prescribes that wine with geographical origin, and wine with additional traditional designation "young", may not be placed on the market by the company, contrary to the provisions of this Law (Art. 65, p.14-17, Law on Wine).

Fines intended for misdemeanors committed by an entrepreneur, in accordance with this Law, are prescribed in the range from 150,000 to 500,000 dinars, and from 50,000 to 200,000 dinars (Art. 66-67, Law on Wine).

The larger amount refers to the following violations: performing wine production activities when the producer is not entered in the Wine Register; if during wine production sugar, brandy, ethanol and other substances that change natural ingredients of the must are used; if there are no separate facilities not interconnected with the facilities where distillates are produced, or oenological products are stored; if there are no separate vessels for storage of table wine not made from grapes from the Republic of Serbia, from vessels for storage of wine from grapes from the Republic of Serbia; if oenological practices and means by which the natural characteristics of wine cannot be preserved and developed are applied; if sugar is added to both rectified and concentrated rectified must when making wines of geographical origin; if wine from the Republic of Serbia is mixed with other imported wines; if wine is repackaged from its original packaging; if wine is placed on the market not in the original packaging and as such is offered to the final consumer; if wine is bought and sold exclusively from another manufacturer in bulk for further processing (Art. 66, Law on Wine). The enumerations listed in this way give the impression that economic offenses are prevailing, however, the legislator in this way comprehensively, evenly and purposefully distributes the fines, being fully aware of the importance of viticulture in both agricultural and economic production, and of further distribution of wine, both in the domestic and foreign markets.

A smaller wine related fine, conditionally speaking, is prescribed by the legislator in the following cases: if wine records are not kept, if not every bulk wine container intended for production, storage and aging of wine is marked; if wine was placed on the market although the shortcomings were not remedied; if wine is packaged and declared

contrary to the quality regulations; if wine of geographical origin is not marked with a record stamp; if table wine produced from own grapes is offered in bulk outside the winery the same wine is produced in; if wine of geographical origin, or wine marked "young" is placed on the market contrary to the provisions and rules of this Law (Art. 67, p. 6, 7, 8, 11, 12, 14, 17, Law on Wine).

The legal provisions presented in this way, dedicated to fines, indicate the intention of the legislator to fully regulate wine production as an important branch of both the economic and agricultural branches in the Republic of Serbia. In addition to fines, the Law on Wine provides a protective measure - prohibiting the performance of certain activities for legal entities and responsible persons to perform certain duties for one to five years in the case of wine production using grapes directly native hybrids and grapes from nurseries (mother plant) (Art.64, pr.1 p1, Law on Wine).

The Republic of Serbia's Law on Wine does not provide for criminal liability as does the Law on Wine of the Republic of North Macedonia in Article 59-v. Criminal liability is provided for a wine producer who places wine on the market in case of submitting an unreliable report to the relevant Ministry; use of funds contrary to the statement of the responsible person given before the notary under material and criminal responsibility that the funds obtained from the sale of exported wine will be used primarily to pay debts based on purchased but unpaid grapes: does not submit a report on funds obtained from the sale of wine turnover and the manner of spending them, within the prescribed period of 15 days from the date of receipt of the decision to place wine on the market or submit a false report to the State Inspectorate for Agriculture. The envisaged punishment for the mentioned criminal responsibility is a prison sentence of one to five years. Criminal liability of wine producers in the Republic of Serbia is provided exclusively in the Criminal Code of the Republic of Serbia. We are of the opinion that the criminal responsibility provided for in the Law on Wine Republic of North Macedonia, adjusted, can be implemented in the Criminal Code of Republic of Serbia.

Criminal liability of wine producers

A large number of human activities aimed at human well-being, unintentionally or unconsciously cause harmful consequences aimed at the person, or the environment which he lives in (Jovanović, 2017). Thus, according to the Law on Wine, Article 50, in the Republic of Serbia it is not allowed to sell wine in several cases: in bulk at markets and in restaurants; if bottling, especially service bottling, is done by persons who are not registered in the Wine Register, and if wines which are spoiled, with flaw or inaccuracy are traded and sold (except for further processing), regarding those that are not suitable for human consumption.

All the above mentioned corroborates the seriousness of the legislator, wishing to avoid the consequences that arise from the Criminal Code ("Official Gazette of RS", No. 85/2005, 88/2005-corrigendum, 107/2005-corrigendum, 72/2009, 111/2009, 121/2012, 104/2013, 108/2014, 94/2016) of the Republic of Serbia (Stojanović, 2011). The Republic of Serbia,

through its legislation, protects both producers and consumers, and consumers of wine. However, if the producers, nevertheless, put on the market wine that is spoiled, has a flaw or inaccuracy, they will be liable in accordance with the legal rules prescribed by this Criminal Code.

Namely, the Criminal Code of the Republic of Serbia in Chapter 23 prescribes criminal offenses against the human health. The protective object is human health, and the consequence is a threat to human life. Hence, Article 256 explicitly lists several sentences: imprisonment from six months to five years, imprisonment for up to three years, imprisonment for up to one year, and a fine. These penalties also apply to those who sell[14] and market harmful foodstuffs, food or drink.

Pursuant to the Criminal Code, in the same article, paragraph 2 speaks of imprisonment and a fine. In accordance to this paragraph, a wine producer who releases wine that has not been inspected by an authorized person[15] shall be punished by imprisonment for a term not exceeding three years. This position comprises two acts of execution: placing on the market, in this case drinks - wine, without the necessary inspection by an authorized person at the moment when the wine should be inspected in accordance with regulations, as well as placing wine on the market with a deadline not for human use.

These two paragraphs of this article, without a doubt, state that intent prevails, attributing the right to a judge of the Criminal Courts, if there is a case related to wine production, to examine whether this crime was committed intentionally, or in negligence (Topalović, 2010, Marković, 2020). Why? Since placing the wine on the market with certain inadequacy and inaccuracy fatal to human health is a criminal offense committed through negligence, the Criminal Code offers the mildest punishment of all those listed in Article 256. Therefore, if this criminal offense is committed through negligence, then the legislator prescribes a prison sentence of one year for the perpetrator of this crime. This penalty is also prescribed in the article as an alternative because it contains "or", so it is possible to impose an alternative fine - a fine, which is not the case with the penalties in the previous two paragraphs.

Finally, in Article 256 of the Criminal Code, the legislator unequivocally states that the product (in our case, wine) shall be confiscated. This indicates the fact that the Republic of Serbia takes care not to damage the health of potential, future buyers, consumers, and consumers of wine that has a flaw and an inaccuracy, and thus prevents the occurrence of large and unforeseeable consequences, such as death, which would occur as a result of alcohol poisoning, for example, from wine.

Conclusion

The ultimate goal is to prevent the occurrence of harmful consequences for the health of people who consumed this agri-food product produced with a defect. This indicates that the analysis in the paper is based on the following hypotheses: wine is an important

14 Although the perpetrator of this crime can be any person, for the purpose of this paper we consider only wine producers

15 In this case, the agricultural inspector is in accordance with the law on wine.

agri-food product since the oldest civilization, there is a need for more precise definition of certain provisions of the Law on Wine and sanctioning activities that inadvertently cause harmful consequences for humans and the environment.

Undoubtedly, wine and wine production are gaining large importance in the Republic of Serbia. Wine, as shown in this paper, has been known to man since the ancient times. Through the fragmented representation of wine in the Roman law, it could be said that even in the Roman times it occupied an important place in society, and could be sold and inherited in accordance with the rules valid in Rome at that time. It is indisputable that the Romans took care of wine's quality and manner of storage. The famous amphorae collected 26 liters of wine but other forms and types of vessels were also used, also collecting a certain amount of wine. We must not fail to notice that the sale of wine was in accordance with the special rules given both in terms of the weight and size of the vessel, and that it was considered a generic thing. After a brief insight into the place of wine in the Roman law, one might gain or confirm the impression that the "a blissful gift from Gods" had primacy in Roman society as a commodity used long before money was used as a means of payment. The analysis of the sale of wine in Roman law confirmed the hypothesis that wine has been a significant product since the earliest civilization.

After reviewing the Law on Wine, specifically the provisions dedicated to wine, production and types of wine that are determined by law, one gets the impression that the Republic of Serbia cares about the production process, quality and marketing. The use of inappropriate oenological practices and oenological products is prohibited. It seems that the Republic of Serbia intends to bring wine and its production to an enviable level as one of the leading agricultural and food products in the country. Comparing the Law on Wine of the Republic of Serbia with the laws on wine of the surrounding, neighboring countries, we come to the conclusion that it precisely defines wine as an agricultural and food product. We comment on the fact that certain bylaws such as the Ordinance on quality and other requirements for wine ("Official Gazette of RS" No. 87/2011 and 26/2015) use the term product, which the Criminal Code itself do, and should be used the term agri-food product defined in the Republic of Serbia's Law on Wine. This law also shows the aspiration of the Republic of Serbia to bring order to production, and this is reflected in the penal provisions. Penalties, which are not small values, allow us to think that all those companies and individuals who are seriously engaged or intend to engage in wine and its production, must adhere to a number of legal rules and measures to obtain a superior product that is important for our country. The penal provisions of the law are provided just for economic offenses and misdemeanors, but not for criminal liability, as the Republic of North Macedonia's Law on Wine does. We believe that criminal responsibility and sanctions should be left to the definition in the Criminal Code, which does not mean that it should not be extended in the image of the legal definition of North Macedonia. By comparative analysis of the law on wines, we came to the conclusion that it is necessary to regulate, more precisely, the placing of wine on the market and the conditions for the sale of wine, as provided by laws adapted to European Union regulations. It is also

necessary to expand the list of responsible persons, which is currently limited to natural and legal persons who produce wine. The mentioned conclusions do not suggest a "bad" Law on Wine, but propose the need to amend and the need to expand the Criminal Code, which confirms the hypothesis of more precise determination of certain provisions of the Law on Wine and sanctioning activities that inadvertently cause harmful consequences for humans and the environment.

We should especially keep in mind the case of "Zozovacha" from 1998, when 43 people lost their lives due to the unprofessional handling during the production of alcoholic beverages. This case warns one about the terrible scale of the problem if the rules and principles prescribed by the Law are not respected. This case leads us to the need for a more precise legal determination of the production and trade of products due to defects whose ultimate goal is to prevent harmful effects on the health of people who consumed this agri-food product produced with a flaw or inaccuracy. In this manner, it is interesting to state that the Republic of Croatia in their Law on Wine in article 38, p. 2, forbid the sale of diseased wines, defective wines, wines and other grape and wine products harmful to health, so we do feel that the legislator of our country should follow this concrete example by amendment in the Law on Wine such article.

The authors believe that criminal responsibility, at least in the case of wine production, should not be left only to "the one who produces and puts such wine on the market". In this context, the authors believe that Article 256 of the Criminal Code of the Republic of Serbia should be expanded, and criminal liability should exist against those responsible for wine quality, in this case agricultural inspectors, because they are the ultimate instance in creating a product safe for human's health.

In the end, the research in this paper showed and confirmed that wine is not only a part of history and our tables, but also a part of our legislation as an agri-food product.

Conflict of interests

The authors declare no conflict of interest.

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COST-EFFECTIVENESS ANALYSIS OF ORGANIC HONEY PRODUCTION IN SERBIA

Marija Nikolić[1], Nebojša Nedić[2], Suzana Đorđević-Milošević[3]

**Corresponding author E-mail: mnikolic@agrif.bg.ac.rs*

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ABSTRACT

Economic justification of organic honey production is analyzed in the paper. The emphasis was placed on specific revenues and expenses that occur in organic honey production, and economic justification was examined by calculating indicators of economic efficiency, profitability and labour productivity. Based on the collected data, a calculation of production was made and a profitability threshold was established, which is achieved with 38 bee colonies, or with production volume of 570 kg of honey. Farms with more colonies have better indicators of production success. The expenses arising from the transition from conventional to organic production will be most quickly covered by farms with 200 bee colonies that generate enough income from organic honey production to operate positively in the third year of organizing such production.

Introduction

The demand for organic food is growing stronger in the world, not only because of its beneficial effects on consumers' health but also because of the high level of respect for the environment. There is a particular interest in organic honey, which is most commonly consumed as fresh and unprocessed quality food, a natural substitute for sugar, and in some cases, as a complementary medicine (Miguel et al., 2017). With increasing interest and demand for organic bee products in the world, the production capacities are growing. Organic honey was produced in over 3.2 million hives worldwide in 2017, accounting for 3.5% of the total number of beehives (Willer, Lernoud, 2019). There

1 Marija Nikolić, Ph.D., Assistant Professor, University of Belgrade, Faculty of Agriculture, Nemanjina 6, 11080 Zemun, Serbia, E-mail: mnikolic@agrif.bg.ac.rs, ORCID ID (https://orcid.org/0000-0002-8691-7113)

2 Nebojša Nedić, Ph.D., Associate Professor, University of Belgrade, Faculty of Agriculture, Nemanjina 6, 11080 Zemun, Serbia, E-mail: nedicn@agrif.bg.ac.rs, ORCID ID (https://orcid.org/0000-0002-7671-5139)

3 Suzana Đorđević-Milošević, Ph.D., Associate Professor, Singidunum University, Environment and Sustainable Development Studies, Danijelova 32, 11000 Belgrade, Serbia, E-mail: sdjordjevicmilosevic@singidunum.ac.rs, ORCID ID (https://orcid.org/0000-0003-2401-8742)

are five European countries among the ten leading countries in organic beekeeping capacities, namely Italy, Bulgaria, France, Romania and Spain (Willer, Lernoud, 2015).

North Macedonia has the highest number of hives for organic honey production in neighbouring countries. After initial intense interest in organic beekeeping, the number of beehives in Macedonia increased to over 15,000 in 2009, but it was decreased to 6,932 in 2015 (Kolev, 2018). Croatia has 3,418 hives, followed by Slovenia (1,400), Montenegro (1,057), and Bosnia and Herzegovina (238). According to the data from the National Association for the Development of Organic Agriculture of Serbia – Organica, there are 471 hives for organic production, while the rest up to 2,504 is in the conversion process (Table 1).

Table 1. The number of beehives certified for organic production and in conversion in Serbia

Year	**2012**	**2013**	**2014**	**2015**
No. of hives	961	1,940	894	2,504

Source: Simić I. (2017): Organic Agriculture in Serbia: at a glance 2017, p. 17

Producers' commitment to organic production is determined by many factors, including education level, level of knowledge of this type of production, prerequisites for conversion and certification, and others, but one of the main incentives for engaging in organic production is economic benefits that can be obtained.

Agrarian structure in Serbia is characterised with small farms, particularly in the South of the country, with high presence of extensive agriculture. It is also the case in some other European countries, such as Poland. Duguleana et al. (2018) believe that these small farms are easily converted in organic production since they are often "organic by default" and that it is one of the reasons for steady evolving of organic agriculture in this country since Poland's accession into the European Union in 2004. This also contributes to Serbia's high potential for organic agriculture, and explains the willingness of farmers to be involved in such production if it provides sufficient economic benefit.

With increasing consumer interest in organic products, including organic honey, this production has attracted growing attention in the literature. Nevertheless, the volume of papers analyzing the specificities of organic honey production from an economic point of view is relatively low. This paper aims to record in transparent manner revenues and costs arising from organic honey production to examine the economic justification of this production.

Materials and methods

The data used in this study can be divided into three groups. The basis for making the calculation related to honey production was the data collected through the survey of opinions of 98 beekeepers from three regions of the Republic of Serbia (Belgrade Region, Region of South and East Serbia, and Region of Šumadija and West Serbia).

The survey was conducted in 2017 using a face-to-face survey questionnaire. The questionnaire was designed following the defined research objectives.

The second group of data about specifics of organic production was collected by the method of in-depth interviews with selected beekeepers with large number of bee colonies and beekeepers practicing organic production. In addition to honey producers, data were also collected from interviews with wholesalers and honey processors. The third group of data, which primarily relates to the prices of inputs in organic beekeeping and prices of organic honey, were collected on the market of the Republic of Serbia.

Descriptive statistical analysis was used to process the data collected through the primary survey. The obtained data were analyzed by the method of calculation, which made it possible to calculate the total revenues and expenses.

As a basic indicator of the economic success of organic honey production, the financial result was calculated as the difference between total revenues and total expenses. To assess the economic justification of organic honey production, standard gross margin, the profitability threshold, and the indicators of economic efficiency, profitability, and productivity were calculated.

Theoretical and research background

Analysis presented in the paper demanded thorough research related to the revenues and costs of organic honey production. In this part of the paper theoretical background and explanations related to the implemented methods of calculation are given.

Revenues in organic honey production

Revenues and expenditures in organic beekeeping have certain specificities that have been taken into account when making the calculation presented in this paper.

Total revenues from organic honey production consist of revenue from the sale of products and subsidies per beehive, while revenues from the sale of beeswax are excluded. In conventional production, in addition to the sale of honey, revenue is also generated by the sale of beeswax (and, in some cases, by sale of other bee products), but this is not a practice in organic production. The use of organic wax is one of the critical prerequisites for organic beekeeping and an essential measure during the conversion period (Naturland, 2005). In the absence of organic beeswax on the market, beekeepers can produce it on their own if wax cap are free of contamination with substances not authorised for use in organic production. The total revenue from the sale of products in organic beekeeping does not include revenues from the sale of beeswax since organic beeswax is used in one's own production and is rarely marketed. Besides, the market of organic products in Serbia is poorly developed, even when it comes to final products, such as honey, while it is virtually non-existent for intermediates such as beeswax. This means that revenues in organic beekeeping consist of sales of organic honey and subsidies per beehive.

The revenue from honey sales depends on the yield per hive, which is lower in organic production than in the conventional one, and the market price, which is, as a rule, higher for organic products.

Yields in conventional and organic production differ due to different production systems, characteristics of inputs, and other factors. Yields in organic production are lower than those achieved in traditional by five percent to as much as 34 percent (Seufert et al., 2012), although with good production practices and high level of producer training, differences in yield levels can be significantly reduced.

Regardless of the type of production, revenues are primarily determined by the level of market prices. Honey is one of the few agricultural products that reach consumers almost unchanged. The part of honey's image is as a wholesome, natural food, and therefore, there is a keen interest in organic honey. Producers who can supply certified organic honey, which has a strong demand within EU market, can expect to get a premium price (Bradbear, 2009).

Prices of organic honey

There is an agreement in the literature that prices of organic products are higher than those of conventional production, but different views can be found about the scope of this difference. Ma et al. (2017) state that organic farmers receive higher incomes due to higher prices received, compared to conventional farmers, while according to Barbu and Băra (2010) organic product prices are 20 to 60 percent higher than for conventional products. Yin et al. (2017) found that consumers are willing to pay more for food carrying Chinese organic label, and even more for EU organic label than those carrying no label. Bradbear (2009) points out that the price of organic honey is higher than the price of conventional honey, which means that higher revenues are generated in organic production. Vlahović and Šojić (2016) believe that the difference in price depends on the country of production, product type, and length of the supply chain, but that organic food products on the Serbian market are about 50 percent more expensive on average than conventional ones.

In the Serbian market, prices of organic products are limited by the demand for these products and the level of the living standard of the population, the scope of supply, but also by the degree of development of organic products market. Depending on the type of product, marketplace, supplier, and season, the prices of organic agricultural and food products in Serbia are higher from 50 to even 400 percent compared to the prices of the same conventional products.

There are significant differences between the price of organic honey in wholesale and retail. The wholesale price of organic honey is determined by the fact that the wholesale purchase of organic honey is not developed on the market of the Republic of Serbia and that only one company is purchasing. The retail price depends significantly on marketing channels. Selling directly at a farm does not burden a product with significant sales costs and prices are generally lower. On the other hand, the sale of organic honey in specialist stores, in special smaller packages, results in extremely high prices.

Distribution of organic honey

Beekeepers do not sell all the honey they produce. Part of the production is retained on the farm for natural consumption, gifts, and promotion, and what is even more critical, for reproduction purposes in organic production. It is recommended that organic beekeepers use their own honey for winter bee consumption, or, if necessary, sugar or sugar syrup of organic origin may be added (Naturland, 2005).

The quantities of honey that are offered to market depend on the number of beehives, or the volume of production. In addition, sales are carried out through different market channels. Part of the marketed production is sold to wholesale buyers and part in retail at different prices, which directly affects revenues.

A prerequisite for using different channels of honey marketing is the existence of a well-structured and developed market. Weak market structures characterized by lack of some players, such as wholesale purchasers and processors of honey, limit producers in marketing products and make it challenging to sell significant quantities in a shorter period. The use of direct marketing channels, that is, supplying final consumers, is characteristic of beekeepers with a smaller number of colonies, which allows them to reach satisfactory prices and avoid intermediaries. It is not uncommon for organic products to be sold locally. Research showed that in the organic farmers' market, 35% of products had travelled less than 50 km (Partalidou, 2015). Al-Ghamdi et al. (2017) found that in an underdeveloped honey market, about 60% of beekeepers, even those with over 100 colonies, use direct marketing channels in the absence of large wholesale honey buyers and processors. The authors further emphasize that the existence of intermediaries buying significant quantities of honey from producers is significant and that such a market structure may increase the interest of beekeepers to apply modern beekeeping practices to increase the production of honey on their farms.

The organic market in Serbia is still underdeveloped, and a particularly important factor limiting demand is low consumer education and awareness of the importance of organic products consumption. This market is additionally burdened with the strong competition from abroad, which makes the sales of organic honey in Serbia very challenging.

Subsidies in organic honey production

In addition to honey sales revenue, subsidies are included in total organic production revenues. The European Union, the world's second-largest producer of honey after China, subsidizes beekeeping significantly, having in mind its crucial role in agriculture. Honey bees play a central role in agriculture as pollinators and they are valuable to the ecosystem as that pollinate more than 90% of insect-pollinated plants (Getachew, 2018). In the period from 2020 to 2022, apicultural programmes in the EU are supported with 240 million Euros, and the allocation of funds is based on the number of beehives in each EU country (EC, 2019, August 28). Other countries also provide subsidies for organic farmers. Ma et al. (2017) state that China government provide financial support to certifies organic farmers' organisations such as agricultural cooperatives.

Incentives for organic agricultural production in Serbia are regulated by Law on Incentives in Agriculture and Rural Development, RS Official Gazette, 10/2013, 142/2014, 103/2015 and 101/2016, which stipulates that they are at least 40% higher than incentives in conventional production and amount to 8.5 Euros per hive. All beekeepers with between 20 and 1,000 beehives receive subsidies.

In addition to production subsidies, beekeepers can use other forms of support. Financial support in the form of reimbursement of certification costs was first introduced in 2005/06 at a relatively modest amount, but it was multiplied after 2011 (Vehapi, 2014).

Costs of organic honey production

Costs in organic beekeeping can be divided into fixed and variable costs. Fixed costs include depreciation of hives, equipment, and vehicles; costs of permanent labour, that is, the work of beekeepers, honey analysis, costs of selling (leasing stalls), and other expenses, such as costs of memberships in different associations. Variable costs include hiring a veterinarian and purchasing medicines, maintaining beehives, replacing frames, queen bees and honeycombs, feeding costs, packaging per unit and seasonal workers, and fuel costs for visiting and moving beehives.

The largest share in the structure of total costs is attributable to the costs of the permanent labour, especially the income of beekeepers. These costs include health and compulsory pension and disability insurance, plus the minimum wage in the Republic of Serbia in 2017 when the survey was conducted.

The use of selected medicine, especially in the control of *varroa* parasites, is one of the biggest obstacles in organic production (Willer, Lernoud, 2019). Medicines used in organic honey production can be purchased on the market of the Republic of Serbia, but they are significantly more expensive than those used in conventional production. The procurement of swarms and especially queen bee's replacements is also specific. In organic production, 50% of queen bees are changed annually, with all inputs in organic production being more expensive, resulting in higher total costs.

One of the critical items in organic beekeeping is the replacement of honeycombs. A significant number of beekeepers independently produce honeycombs made of organic beeswax. The analysis conducted is based on the fact that beekeepers are with experience and certified organic production. Therefore, in calculating the cost of replacing honeycombs, the starting point was the fact that a beekeeper can use organic beeswax, which they have independently produced, melt it, and produce honeycombs, which is the practice of organic beekeepers in Serbia indeed. The use of organic wax for the production of honeycombs is the main reason that the income from the sale of beeswax in organic beekeeping is not included.

Results and discussion

This paper analyzes the economic success of organic honey production. Beekeepers are divided into four categories with 30, 50, 100, and 200 bee colonies each. The starting assumption was that all producers practice mobile beekeeping, as well as that all of them already have certified organic production; that is, they have undergone a conversion period, with certification being individual.

Total revenues in organic honey production

Total revenues in organic honey production were calculated based on the previous analysis and they consist of sales of organic honey and subsidies per beehive (Table 2). Sales incomes depend on yields and prices of organic hone. This analysis started from the yields in conventional production, which averaged 22.2 kg per hive, with variations by beekeeper groups (Nedić et al., 2019). It was assumed that yields in organic honey production were 25 percent lower than in conventional production, which means that yield ranging from 15 to 18 kg per hive were applied. Organic honey prices were collected on the market of the Republic of Serbia in March and April 2019. A wholesale price of organic honey of 4.8 Euros per kg was applied, which is 1.8 times higher than the wholesale price of conventional honey. The choice of price has been confirmed by beekeepers practicing organic beekeeping and represents a realistic market price. Despite the stated price range for organic honey, a single lower value of 13.6 Euros for all types of honey was used in the calculations in the paper, which was obtained based on a survey among beekeepers.

Table 2. Revenues in organic honey production by the size of beekeeping farms

Revenue type		Number of colonies			
		30	**50**	**100**	**200**
Honey sales	Euros	4,884	6,925	10,388	18,803
	Participation (%)	95.0	94.2	92.4	91.7
Subsidies for organic production	Euros	256	427	854	1,709
	Participation (%)	5.0	5.8	7.6	8.3
Total revenues (Euros)		5,140	7,352	11,242	20,512

Source: Authors' calculation based on the conducted research

Other important issue is the distribution of organic honey. Based on the responses collected by the beekeepers surveyed, the following method of income calculation was applied in this analysis. Beekeepers with 30 colonies sell 80% of their quantities in retail, while the rest is kept on farms. Beekeepers with 50 colonies sell 55% of their products in retail and 25% to wholesale buyers. Producers with 100 colonies sell 65% of their output to wholesale buyers and one-fourth in retail, while beekeepers with the most significant number of colonies sell 80% to wholesale buyers and only 10% in retail. The remaining amount of produced honey (up to 100%) is kept on farms.

Beside sales income, subsidies are included in total organic production revenues. Subsidies in organic production range from 5.0% of total revenues for beekeepers with the smallest number of colonies, to as much as 8.3% for beekeepers with 200 colonies, which means that with the increase in the number of colonies their share in the structure of total revenues increases. Compared to conventional production, the revenue generated from organic production is about 50% higher on average.

Total costs of organic honey production

Costs in organic beekeeping are divided into fixed and variable costs. Costs of certification were 250 Euros for farms with 30 colonies, 350 Euros for 50 colonies, 450 Euros for 100 colonies, and 550 Euros for farms with 200 bee colonies.

The largest share in the structure of total costs is the costs of the permanent labour. These expenditures have a high share in the structure of total costs, especially for hobby beekeepers with 30 colonies (52.1% of total costs), while for beekeepers with the most significant number of colonies they have a share of 24.0%. Such findings are consistent with other studies (Yildirim, Agar, 2008; Marinković, Nedić, 2010).

Table 3. Expenses in organic beekeeping by categories of beekeeping farms

Type of costs		Number of colonies			
		30	50	100	200
Variable costs:					
Feeding		580	967	1,933	3,866
Drugs and veterinary service		240	393	777	1,543
Beehive maintenance and material replacement		286	477	953	1,906
Fuel costs for visiting and moving beehives		508	509	560	1,017
Seasonal workers		92	152	305	610
Certification costs		250	350	450	550
Other variable costs		137	181	162	213
Total variable costs	Euros	2,093	3,029	5,140	9,705
	%	37.5	45.9	56.9	68.5
Fixed costs:					
Depreciation of equipment and beehives		318	402	721	1289
Compulsory contributions to pension fund for permanent labour (beekeeper)		610	610	610	610
Beekeeper's salary		2,293	2,293	2,293	2,293
Other fixed costs		265	265	265	265
Total fixed costs	Euros	3,486	3,570	3,889	4,457
	%	62.5	54.1	43.1	31.5
Total expenses		5,579	6,599	9,029	14,162

Source: Authors' calculation based on the conducted research

In organic production, feeding bees is allowed only in extreme climatic or other specific conditions, and then only with organic honey (Annand, 2010), preferably from the same production unit (Mirecki et al., 2011). In production conditions in Serbia, it is allowed

to feed bees with honey, sugar syrup, or sugar from organic production if the survival of bees is threatened by weather conditions (The Rulebook on Control and Certification in Organic Production and Organic Production Methods, RS Official Gazette, 48/2011 and 40/2012, Article 49). Organic sugar is available on the market of the Republic of Serbia exclusively in specialized stores in packages of 500 g or less at prices ranging from 6.0 to 9.8 Euros per kg, which is higher than the wholesale price of organic honey indicating that its use in feeding bees is unprofitable. Therefore, the analysis envisaged that, if necessary for the survival of colonies, organic honey is used in supplementary feeding of bees, namely, 6 kg of organic honey per beehive.

Two relocations are planned during a production year, though three relocations are required in organic honey production in the years with worse climatic conditions. Moving costs include the cost of hiring workers and the cost of purchasing fuel. The hives can be moved to appropriate locations following the conditions prescribed in the legislation of the Republic of Serbia, which is harmonized with the EU legislation in this field (The Rulebook on Control and Certification in Organic Production and Organic Production Methods, RS Official Gazette, 48/2011 and 40/2012, Article 42).

Nemes (2009) states that if fixed costs in organic production do not include labour costs, then they account for a smaller fraction of total costs and are not crucial in determining the economic success of a farm. In this analysis, fixed costs cover the costs of hiring permanent labour and therefore represent a significant proportion of total expenses, especially for beekeepers with lower capacity. With increasing production capacity, variable costs have a greater share in the structure of total costs, accounting for 68.5% of total costs for beekeepers with 200 colonies. Fixed costs, especially those for permanent labour, are higher for beekeepers with fewer colonies (Table 3). Certification costs account for about 5% of total expenses.

The total expenses in organic production are higher than the expenses incurred in conventional honey production at all levels of production capacities, which is due to the inclusion of certification costs, but also to the fact that more expensive inputs are used in organic production. Expenses in organic honey production on farms with 200 colonies are 59% higher than expenses in conventional production, which is consistent with the findings of other authors who found that costs in organic honey production could be about 70% higher than in conventional production (Güemes-Ricalde et al., 2006).

Economic justification of organic honey production

After considering the revenues and expenses that arise in the production of organic honey depending on the size of production capacities, selected economic indicators were calculated on the basis of which the economic feasibility of this production was examined.

De Figueiredo et al. (2016) found that honey value chains could have greatly increased performance with higher pay-off strategies, among which organic certification contributed the most to performance. This study also showed the positive contribution

of organic beekeeping on economic benefits of producers.

The financial result achieved by category of beekeeping farms indicates that the production of organic honey on farms with 30 colonies is not economically justifiable since they operate with a loss (Table 4). The profitability threshold is the volume of production at which total revenues exceed expenses, i.e. above which a positive financial result is achieved. The profitability threshold in organic honey production in Serbia is reached at 38 beehives or at the volume of production of 570 kg of honey.

Organic honey production is not economically justifiable for less than 38 hives. It is, therefore interesting to analyze why individual producers engage in this production if they incur losses. Namely, fixed costs represent a significant burden, especially for hobby beekeepers with up to 30 colonies. Particularly significant from this group of costs are the costs of permanent labour, that is, the payment of minimum personal income and pension and health insurance.

One of the main reasons for including these costs in all categories of beekeepers is the tendency to show in the calculation all costs that could be incurred in this production, as well as to consider the real economic justification for organizing the production of organic honey. However, there are different views in the literature as to whether these costs need to be shown on the expenditure side. Some authors point out that these costs should not be included because the activities in the apiary are carried out by beekeepers and members of their households (Knaus, Milotić, 2001). This is characteristic of small producers, for whom beekeeping is not a core business. In other studies, only mandatory beekeepers' pension insurance is included in the total costs (Gugić et al., 2010).

If these costs are included in the calculation, the category of beekeepers called "hobby" does not generate enough income to cover all the expenses. If these costs are excluded from the total costs of organic honey production, beekeepers with 30 colonies incur expenditures at the level of 2,676 Euros, with revenues unchanged at 5,140 Euros. In other words, if the so-called hobby beekeepers exclude labour costs from the calculation, they have a positive financial result, i.e. a profit of 2,464 Euros. This explains the willingness of beekeepers with fewer colonies to engage in organic honey production.

Gross margin is calculated as the difference between revenue and variable costs, with revenue calculated as the product of the selling price of honey and the realized volume of production (subsidies are not included). All farms have a positive gross margin, or in other words the value of production without subsidies is greater than the variable costs for all groups of beekeepers.

Economic efficiency is the ratio of total revenues and total expenses incurred in production. According to the conducted research, economic efficiency on farms with 50 bee colonies is 1.11 and on farms with 100 colonies 1.24, which means that each Euro invested in production results in 1.11 and 1.24 Euros in income. Greater economic efficiency is achieved on farms with 200 colonies where each Euro invested generates 1.45 Euro in revenue.

Table 4. Economic indicators in organic beekeeping by farm category (Euros)

Selected indicators	No of hives			
	30	**50**	**100**	**200**
Product sales revenue	4,884	6,925	10,388	18,803
Total revenues	5,140	7,352	11,242	20,512
Variable costs	2,093	3,029	5,140	9,705
Gross margin	2,791	3,896	5,248	9,098
Fixed costs	3,486	3,570	3,889	4,457
Total expenses	5,579	6,599	9,029	14,162
Financial result	-439	753	2,213	6,350
Economic efficiency	-	1.11	1.24	1.45
Profitability	-	10.24	19.68	30.96
Productivity of labour	-	76.05	184.82	303.01

Source: Authors' calculation based on the conducted research

Profitability is the ratio of financial results to total revenue. The profitability ratio shows that farms with 50 or more beekeeping colonies are profitable. Finally, labour productivity shows how many units of financial result were generated per unit of working hours. The total amount of work spent in this analysis is obtained as the sum of working hours by permanent workers (beekeepers) and seasonal workers engaged in harvesting honey and moving beehives. As expected, the highest labour productivity is on farms with 200 colonies.

The economic aspect of the transition from conventional to organic honey production

Based on the information collected through the in-depth interview method conducted with beekeepers practicing organic beekeeping, three periods of importance for the review of cash flow were defined: preparation period, the transition period to organic production, and full organic production.

The preparation period refers to the period before the transition to organic production. During this period, producers are actively preparing to organize organic honey production. This process runs on two separate tracks. One segment involves preparing beekeepers themselves in terms of gathering the necessary information and gaining knowledge related to organic honey production, selecting a certification company, and other activities. The second segment covers preparations in the production process, in particular, the separation of honeycombs.

The transition to organic production includes the year of conversion and the first year in organic honey production. Although these two years differ in terms of dealing with organic production, they are the whole from the economic point of view, because the flows of revenues and expenses are significantly different from other two periods. One of the main challenges in organic beekeeping is the conversion period, which, according to the legislation of the Republic of Serbia, lasts for at least one year (Rulebook on Control and Certification in Organic Production and Organic Production Methods, RS

Official Gazette, 48/2011 and 10/2012). The most common problem at this stage is a lack of knowledge about organic beekeeping and the certification process (Willer, Lernoud, 2019). It is essential that farmers have at least some knowledge related to organic farming. Ma et al. (2017) found that farmers with only basic knowledge may be willing to adopt organic farming, but farmers who acquired specific information about organic farming are more likely to show their willingness to adopt organic farming.

When analyzing cash flows, the assumption was that the conversion period lasts for one year, since beekeepers prepared for organic production in the previous phase. Honey yields per hive are lower in this year, and honey is sold at prices for conventional honey, resulting in lower revenues. The costs are higher than usual for organic honey production, and the costs of replacing conventional wax with organic wax in societies are particularly high. Increased costs and significantly lower revenue generated in the conversion year result in a loss on all farms, regardless of their capacity.

The first year in certified organic production is also connected with many challenges. The honey yield per beehive is the same as in the previous year, but honey can be sold at higher prices, i.e., as organic honey. The subsidies are not included in the revenues. Losses are still recorded in this year, as total revenues are limited by production volume.

The period of full production of organic honey begins with the second year in organic production and lasts as long as production is organized. The analysis of the economic effects of organic honey production presented in the first part of this paper relates to an arbitrary n^{th} year from this period.

Considering the significant investments and high costs in the initial years of organizing organic honey production, the question arises as to how long it would take for these losses to be settled, that is when beekeeping farms will start to achieve positive financial results. The length of this period depends on the size of production capacity and the amount of profit that is achieved in the period of full organic production, so in the transition to organic production, farms with higher capacity and higher profits will cover losses in a shorter period.

Beekeepers with the smallest number of organic honey colonies have a negative financial result, which means that there is no way to cover the costs incurred in the transition to organic production. This confirms that organizing organic honey production on farms with 30 bee colonies is not economically justified.

Farms with 200 colonies will generate revenue to cover losses from the previous period and cover regular production costs incurred in the third year of organic honey production. The smaller capacity causes a longer period to cover the losses incurred during the transition to organic production, so beekeepers with 100 colonies would take six, a beekeepers with 50 colonies even 12 years to achieve a positive financial result.

As the previous analysis showed that permanent labour costs are the determining factor for the economic success of organic honey production, it was examined in what period beekeepers could expect to achieve a positive financial result when switching to

organic production if permanent labour costs were excluded from fixed costs, and all other parameters remain the same.

In this case, all farms, regardless of production capacities, report losses in the year of conversion and the first year of organic production. However, in the second year of organic production, all four categories of farms would generate enough income to make up for the losses from the previous two years and have a positive financial result. This reaffirms the significant burden of permanent labour costs.

Conclusions

The paper presents the results of the analysis of the economic justification of organic honey production in Serbia, depending on the size of a farm. The results showed that farms with 30 bee colonies operate at a loss, i.e. that the profitability threshold is reached with 38 colonies. On farms with 100 colonies, after covering all costs, the profit is 2,213 Euros, while farms with double the capacity generate 6,350 Euros or 529 Euros per month. After the transition from conventional to organic production, largest farms take three years to cover the costs incurred during the conversion period, while farms with 100 colonies take six years if permanent labour costs are included in the total costs. In other words, with the increase in capacity in organic honey production economic results are multiplied. Unlike conventional production, where a gradual increase in production capacity is recommended, that is, an increase in the number of colonies, the obtained results indicate that organic honey production is more economically viable if beekeepers already have experience and that it is economically more profitable to start production with higher capacity. With the development of the market for organic honey inputs and an increasing interest of domestic consumers for this product, further improvement of organic honey production in Serbia can be expected.

Conflict of interests

The authors declare no conflict of interest.

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STATE OF ORGANIC PRODUCTION IN KOSOVO AND METOHIJA - GREAT PERSPECTIVE OR IDEA WITHOUT THE FUTURE

Radica Bojičić[1], Anđelka Tripković[2]

**Corresponding author E-mail: andjelka.tripkovic@pr.ac.rs*

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ABSTRACT

The resource potential of the agricultural sector in Kosovo and Metohija is not sufficiently used, but there is certainly a need for agricultural production, as one of the primary activities, in places inhabited by non-Albanians. The aim of this paper is to analyze the development and potential of organic production in Kosovo and Metohija. For the purposes of this paper, an original questionnaire was formulated, based on when a direct survey conducted in July and August 2021 was conducted. Also, the owner of the only agricultural cooperative „Zubin Potok" in this area, was interviewed. The research showed that a more than thirty/four precent (34,7%) of respondents answered that they plan to expand production, good part of the respondents (23,3%) pointed out that they are interested in a some kind of education if it would be organized by professionals, while more than 90% of respondents involved in organic production said it would mean some form of subsidy or local or international aid. The authors point out that for the development of organic production in Kosovo and Metohija, it is necessary to provide financial support to farms, but also to build a stable market of organic products, which would contribute to the stability and competitiveness of this food production system.

Introduction

„Nature is, after all, the only book that offers important content on every page."

Johann Wolfgang von Goethe

1 Radica Bojičić, Ph.D., Associate Professor, Faculty of Economics, University of Priština with temporary location in K. Mitrovica, Kolašinska no. 156, 38220 Kosovska Mitrovica, Serbia, Phone: +38163/410-758, E-mail: radica.bojicic@pr.ac.rs, ORCID ID: (https://orcid.org/0000-0002-4192-5646).

2 Anđelka Tripković, M.Sc., Teaching Associate and Ph.D. student in Faculty of Economics, University of Priština with temporary location in K. Mitrovica, Kolašinska no. 156, 38220 Kosovska Mitrovica, Serbia, Phone: +38164/45-157-24, E-mail: andjelka.tripkovic@pr.ac.rs, ORCID ID: (https://orcid.org/0000-0002-3972-4933).

Agriculture is as old as human society. Clive Ponting (Ponting, 2009) points out that the beginnings of agricultural production were linked to Southwest Asia, or, more precisely, to the area around the Levant, well known for the fact that during the ancient century, the influences of numerous ancient civilizations changed, from the Assyrians, Babylonians, Phoenicians, all the way to the ancient Greeks and ancient Romans and left trace on it.

The implementation of the global process of economic, political and cultural integration as well as the unification has significantly contributed to the growth of global competition, including the agricultural sector (Zolotnytska and Opalov, 2020). The crucial changes in agricultural production occurred in the middle of the twentieth century, when the Green Revolution took place. Concerns of the population regarding the potential risks to human health have encouraged a number of alternative production methods, where organic production occupies a special place. The concept of organic production was established at the beginning of the twentieth century, first in Europe, then in the United States (Tomaš-Simin and Glavaš-Trbić, 2016). According to some individual authors (Melović et al., 2020), organic production, as a specific system that affects the health of soil, ecosystems and people, arose in response to the imbalance of ecosystems.

According to the Global Organic Agriculture Survey (FiBL-IFOAM, 2021), more than 72 million hectares of land have been used for organic production, including those areas that are in the process of conversion. Since 1999, global sales of organic food and beverages have increased almost sixfold, reaching a value of about $ 105,5 billion in 2018. Whether it is a need or a trend is still unknown, but one thing is for sure, organic production and its products are an integral part of the life of modern man.

Oceania occupies half of the global organic agricultural land (9,6%), followed by Europe (3,3%) and Latin America (1,2%). The growing demand for organic products is concentrated in North America and Europe, as the two largest organic markets in the world. The importance of the segment of organic production for the territory of Europe was highlighted in the middle of 2020, when the European Commission presented a plan on the development and sustainability of the food system in Europe called „farm to fork“. This plan was seen as „heart“ of the European Green Agreement since it advocates redesigning current food systems. However, the growth of the European organic food market is not uniform, that is, it varies between different countries. While one group of countries, France, Ireland, Denmark, achieves double-digit market growth rates, in other countries market growth rates are below average (Vehapi, 2019). Organic production in the Western Balkans is facing numerous obstacles to development, which is a consequence of insufficient use of natural resources. Insufficient areas under organic production are also a limiting factor in development. Almost all countries in the Western Balkans have areas under organic production whose share in agricultural land is below the European average. It is encouraging that, despite numerous limitations, Serbia and Bosnia and Herzegovina achieved the highest growth of organic agricultural land in Europe during 2015, around 60-63% (Willer and Lernoud, 2017). Increasing

exports, education, seminars, engaging the working population, preserving traditions, preserving the environment, preventing migration from rural to urban areas may be just some of the motives for promoting the development of organic production in the Western Balkans.

Table 1. Overview of the growth of organic agricultural land in the world over a period of ten years

Area	Organic agricultural land (ha) in 2008.	Organic agricultural land (ha) in 2018.	Organic agricultural land (ha) in 2019.	One-year growth (%)	Ten years of growth (%)
Africa	880 898	1 854 646	2 030 830	9,5	89,4
Asia	3 293 945	6 363 778	5 911 622	-7,1	140,5
Europe	8 176 075	15 607 636	16 528 677	5,9	64,8
Latin America	8 065 890	8 008 581	8 292 139	3,5	10,0
North America	2 449 641	3 342 849	3 647 623	9,1	47,5
Oceania	12 140 107	35 999 373	35 881 053	-0,3	195,4
World	35 006 557	71 172 783	72 285 656	1,6	102,4

Source: FiBL-IFOAM, 2010; FiBL-IFOAM, 2021.

The production of agricultural products has always been at the top of economic activities in the Republic of Serbia, with about 7% of total GDP, and known as a rare agricultural sector of the Republic of Serbia with a constant surplus in foreign trade (MAFWM, 2020). Agricultural land is one of the primary potentials of the Republic of Serbia and occupies the most important place among the potentials of its development. Good geostrategic position, temperate continental climate, preserved agricultural system and over 70% of land that does not contain harmful organic matter or heavy metals, are just some of the advantages of our country that can be directed towards intensifying and developing organic production.

In the Republic of Serbia, organic production began to develop in the eighties, thanks to the efforts of Den Juro Organic company. The year 2020 was certainly a jubilee year for the Republic of Serbia. In addition to marking the 30th anniversary of the first export of organic fruit, 30 years have passed since the beginning of the development of the non-governmental sector, 20 years since the adoption of the first Law on Organic Agriculture and 10 years since the adoption of the first Law on Organic Production. For the sake of comparison, in 2009 only 108 producers were engaged in organic production on an area of 2 400 hectares, while in the next ten years that number increased significantly, so in 2019 about 6 300 producers were engaged in organic production on an area of 21 000 hectares (National Association Serbia Organica, 2020). Despite the above, the main reason for the backwardness of Serbian organic agriculture is the poorly developed domestic market of organic products (Kovačević, 2021).

Kosovo and Metohija is a province in the south of the Republic of Serbia, and this area is divided into five districts, namely: Kosovska Mitrovica, Kosovo, Kosovo - Pomoravlje,

Prizren and Peć. In all districts, agriculture has long been the main activity of the inhabitants of Serbian enclaves in Kosovo and Metohija. The area rich in meadows, pastures and numerous natural resources is suitable for the development of farming, fruit growing, viticulture and livestock (Figure 1).

In this area, agricultural production is not only a source of subsistence, but also provides social security to a large number of poor and elderly people. Agricultural farms in Kosovo and Metohija are small, and families possess an average of about 3,2 hectares of land, half of which is arable land (available at: http://www.sasb-eu.org/sr/priroda/zapadni-balkan/kosovo). According to the Ministry of Agriculture, Forestry and Rural Development of the Provisional Self-Government in Priština from 2014, the share of arable land in the total agricultural land area is 43,6% (180 381 ha), and the largest part of arable land is cereals (131 949 ha). At the end of the last century, nine agricultural cooperatives operated in Kosovo and Metohija in Serbian areas.

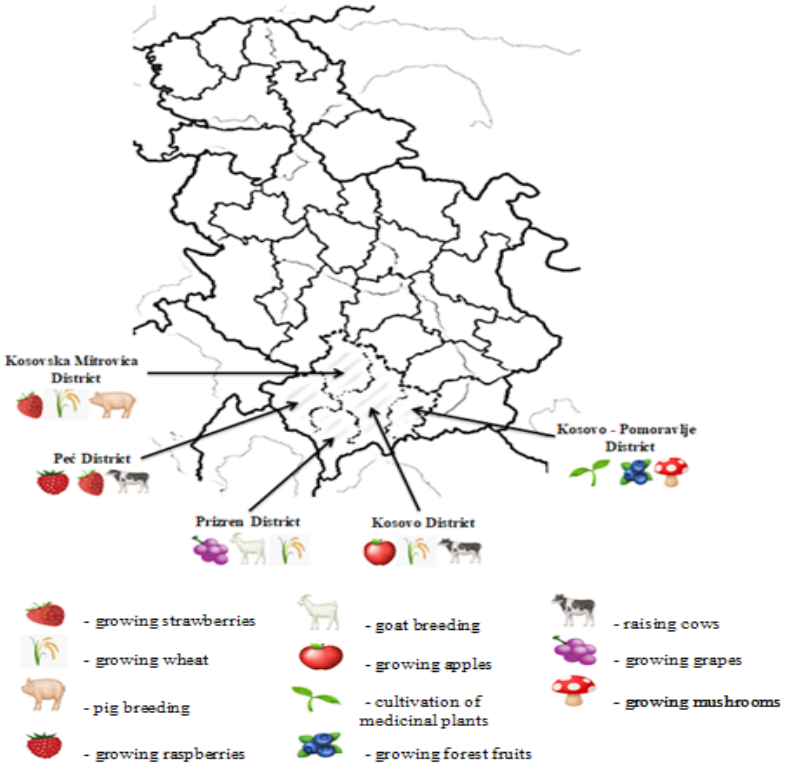
Table 2. An overview of registered Serbian agricultural farms in Kosovo and Metohija

District	Less than 0,5 ha	0,5 – 2,00 ha	2,01 – 5,00 ha	5,01 – 10,00 ha	10,01 – 15,00 ha	15,01 – 20,00 ha	More than 20,00 ha
Kosovo	7	453	838	352	33	4	5
Kosovska Mitrovica	29	495	945	534	163	57	44
Kosovo – Pomoravlje	3	698	882	215	20	3	0
Peć	0	75	143	59	14	4	0
Prizren	1	15	15	3	1	0	0
Total	40	1 735	2 823	1 163	231	68	49

Source: Office for Kosovo and Metohija, 2013.

Unfortunately, today the only surviving agricultural cooperative is in Zubin Potok. From Leposavić, Gračanica, Prekovac, Osojane, all the way to Uroševac and Štrpce, agricultural cooperatives have been a symbol of preserving centuries-old hearths. The primary activity of all these cooperatives was based on supplying farmers with raw materials and on the purchase of surplus agricultural products. Also, the local population was employed in cooperative production, trade, management and administration, which reduced the unemployment rate in rural areas. The importance of cooperative business is confirmed by the experience of the European Union, where cooperatives are becoming an important factor in the development of local and regional economy, which is in line with the concept of integrated rural development (Bijman et al., 2014).

Figure 1. Production characteristics by districts in Kosovo and Metohija



Source: Authors' research

Organic production is on the territory of Kosovo and Metohija at the very beginning. The reason for that is that most farmers strive to intensify their production so they use pesticides and fertilizers, without taking into account the environment. Only a small number of farmers are committed to environmentally healthy production and environmental protection.

Methodology

The subject of the research is organic producers in Kosovo and Metohija, with special emphasis on the conditions and environment in which organic productions occurs. The research process was conducted in two stages in July and August 2021. The first stage was related to the design of an adequate questionnaire that is adapted to the subject and goal of the research. The questionnaire includes 29 questions divided into three groups. The first group of questions is related to basic data on respondents, gender, age, municipality in which they live, average household income, number of household members, area of arable land. The second group of questions refers to the respondents' attitudes about the importance of organic products, the frequency of purchases of organic products, the category of products that are most often purchased, the motives

for buying and the place of purchase. The last, most important group of questions refers to the primary production that respondents are engaged in, attitudes about the conditions for the development of organic production, motives for organic production, barriers to production and marketing that organic producers face and the necessary financial resources for further development of organic production. Respondents were also asked questions to determine their views on the importance of organic production and organic producers using the Likert scale, from 1 „strongly disagree" to 5 „strongly agree". The research included four districts in the territory of Kosovo and Metohija, namely: Kosovska Mitrovica District (municipalities of Kosovska Mitrovica, Zvečan, Leposavić, Zubin Potok and Vučitrn), Kosovo District (municipalities of Priština, Obilić, Gračanica, Štrpce and Lipljan), Kosovo – Pomoravlje District (municipalities Kosovska Kamenica, Novo Brdo, Vitina, Gnjilane and Ranilug) and the Prizren District (Prizren Municipality only). Target group in this research are all farms in the territory of Kosovo And Metohija that could be contacted due to the existence of well-known obstacles. The survey process itself was based on a combined method that included online questionnaire completion, as well as a door-to-door method. The second stage of the research referred to the interview, which was done with the director of the agricultural cooperative „Zubin Potok", Mr. Rade Utvić. The main goal of this form of research is to present the most interesting parts of the conversation in order to obtain information about organic production, but from the aspect of an experienced producer.

Further methodology of the work is focused on the review and review of current literature and on the comparison of previous research on the development of organic production. The obtained results were processed in the program IBM SPSS Statistics-version 26, in which descriptive statistics, Kolmogorov-Smirnov test, Cronbach's coefficient, cross-tabulation and Pearson's correlation coefficient (correlation is significant at the 0,05 level) were performed. The limiting factor in this paper is the lack of statistical data of the Statistical Office of the Republic of Serbia since 1999, which refer to the area of Kosovo and Metohija.

Research Results

Agricultural production has been recognized as one of the key development sectors in the territory of Kosovo and Metohija. Intensive and economically justified agricultural production in Serbian enclaves has been hampered by a number of factors for many years (Maksimović et al., 2015). Measures applied by agricultural producers in order to achieve higher yields in production, in addition to positive ones, can also have negative impacts on the agricultural system. However, organic production requires much more time, patience and dedication. It is not easy to preserve vegetables, fruits, cereals, plants and other products without the use of chemical preservatives.

Precisely 295 respondents from the area of Kosovo and Metohija participated in the research. When it comes to the gender of the respondents, it copmrises 63,9% of the male respondents and 36,1% of the female respondents. Concerning age, the largest number of respondents is aged 21-30 (31,4%), and the smallest number is respondents older than 60 (11,5%). This research also confirmed the long-established fact that households in urban

areas and municipal centers generally have a smaller number of farms, mostly up to 3 members, while households in rural areas have four to five family members. These are mostly two-generation families with parents with children, or extended families, where, in addition to parents and children, there are other relatives in the family household, grandparents. Numerous factors have influenced the changes in the number of households in our region, children are migrating and thus creating a desire for modernization in them, while parents are attached to their households and mainly dedicated to agriculture.

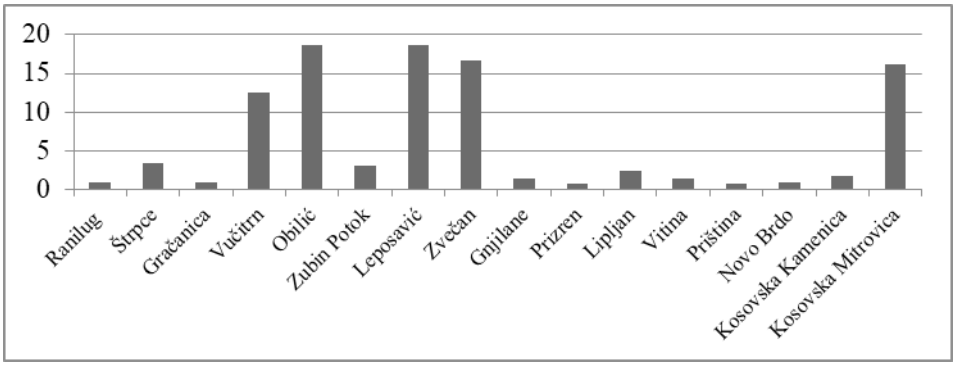
Table 3. Sample structured by gender, age and level of education

Gender	Number of respondents (N)	Percentage (%)
Male	189	63,9
Female	107	36,1
Age	**Number of respondents (N)**	**Percentage (%)**
21-30	93	31,4
31-40	59	19,9
41-50	63	21,3
51-60	47	15,9
60 +	34	11,5
Education level	**Number of respondents (N)**	**Percantage (%)**
Primary education	4	1,7
High school	108	36,5
College	32	10,8
Higher education	62	20,9
Master	88	29,7
PHD	1	0,3

Source: Authors' research

Agriculture is one of the few industries that is primary for the population in many municipalities. However, for most it is the only source of income. This is especially true for municipalities where Serbs are a minority population and are to some extent isolated from the Albanian majority population.

Figure 2. Sample structure by dwelling place

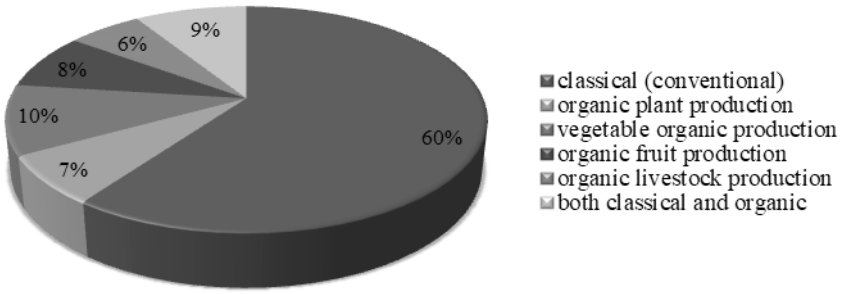


Source: Authors' research

In the 1960s Bogdanović (Bogdanović, 1963) described the area of Kosovo and Metohija as an area with a relatively large number of peasant farms, small land ownership, a large share of the rural population in the total population, underdeveloped productive forces, low productivity and low income, but as distinctly agrarian. For comparison, in our study the largest number of respondents owns up to 3 hectares of land (61,4% of respondents), from 4 to 7 hectares are owned by 21,5% of respondents, 9,9% of respondents are owners from 8 to 11 hectares of land, 5,5% of respondents own 12 to 15 hectares of land, and the smallest number has more than 15 hectares of land (1,7%). Contemporary consumers care more about their health than ever before, and environmental awareness, the availability of information about the benefits of organic food and smells and tastes reminiscent of childhood are just some of the reasons for the increasing purchase of these products. As many as 84,1% of respondents know what organic products are, while 35,5% of respondents buy organic products occasionally. A relatively small group within the surveyed population does not buy this type of product at all (10,5%), which shows that people are mostly aware of the basic benefits offered by organic food products. As the demand for organic products is growing, so are the demands in terms of quality, and this is a great challenge for farmers from Kosovo and Metohija.

The research showed that a small number of respondents have been involved in organic production, and that the primary form of production is still classical (conventional) production (Figure 3). Currently, a number of farmers in Kosovo and Metohija are in the phase of conversion to organic agriculture. Organic farming is, basically, the method that refrains from the use of chemosynthetic fertilizers, pesticides and pharmaceuticals, placing the greatest emphasis on protecting and improving the environment and minimizing pollution (Moser et al. 2010). However, one of the major problems for the development of organic agriculture in Kosovo and Metohija is product certification. Legally, in both the United States and Europe, a producer must be certified as organic in order to market its production as organic (Veldstra et al. 2014). Furthermore, there is no accredited body for certification of organic products in Kosovo and Metohija, and the organizations from Macedonia and Albania have been appointed for that purpose. One of the conceptual solutions is the possibility of group certification, which requires the association of farmers.

Figure 3. Type of production that the respondents have been involved in



Source: Authors' research

The cultivation of agricultural crops has a long tradition in the territory of Kosovo and Metohija, which is confirmed by our research. The process of growing these crops directly depends on the age of the respondents, the average income of the household, the number of household members, as well as the area of land owned by the respondents. Having analyzed the obtained results, the authors came to interesting facts that are of great importance when considering the real situation on the ground which is presented in Table 4.

Table 4. Corellation matrix of analyzed parameters

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
income (1)	1										
purchase OP (2)	.175**	1									
years (3)	.211	-.126**	1								
eduacation (4)	.097	.328**	.368	1							
satisfaction OP (5)	.318	.550**	.014	.220	1						
nutritional value (6)	.157	-.141	.057	.128	-.193**	1					
municipality (7)	.210	.323	-.178	.261	.314	-.137	1				
production (8)	.073	-.145**	.201	-.329	.229	-.271	.034**	1			
terms for OP (9)	-.110	.547	.191**	.101	.351	.035	-.391	-.122	1		
land area (10)	.248	.424	.016	-.216	.363	.036	.218	.125	-.269	1	
costs (11)	-.108	.286	.101	.431	-.303	.088	-.076	.347	.057	.261**	1
subsidies (12)	-.026	.238	.137	-.252	.119	-0.67	.096	.393	.164	.268**	-.076

Source: Authors' research

Respondents were asked „*do you think that organic production is possible in their immediate vicinity*". The largest number of respondents answered that engaging in organic production is possible and that natural potentials allow it (66,9% of respondents), while almost a third of respondents believe that engaging in organic production is not possible or have no opinion (34,1% of respondents). Agricultural production in almost all municipalities is in a period of stagnation, and the main shortcomings, according to respondents, are the low level of technical equipment suitable for production and the lack of adequate mechanization. Respondents were generally opposed to the question „*do you have the need or conditions to expand production*" in terms of answers. More than thirty/four percent (34,7%) of respondents answered that they plan to expand production, but there are no conditions for that, 18,6% of respondents point out that they plan to expand production, but for them the limiting factor is the lack of knowledge about the essence of organic production. Only 11% of respondents have the conditions and plan to expand production, while 35,8% of respondents neither think nor need to expand production. Continuing the question about the planned expansion of production, the respondents expressed their views on the possibility of training (courses, education) in the field of organic production. Almost thirty percent (28,7%) of respondents stated that they would attend some kind of education or course on organic production if it were organized in their municipality. Also, a good part of the respondents (23,3%) pointed out that they are interested in a some kind of education if it would be organized by professionals, or if they would receive certificates of completion of the course

(13,2%). A significantly smaller number of respondents are certainly planning training in this area (11,1%), while slightly less than a quarter of respondents (23,6%) do not think about it at all. More than 90% of respondents involved in organic production said it would mean some form of subsidy or local or international aid. When it comes to a specific amount that would encourage them to further work, mostly all respondents were unanimous and regardless of the differences in the area of land they own, they pointed out that the amount of more than 4 000 euros would mean the most to them.

Discussion

As can be seen in Table 4, although there is a highly statistically significant relationship between the variables *„average household income of respondents"* with the *„degree of frequency of purchases of organic products"* $(p = 0{,}003)$, Pearson's correlation coefficient is quite low $(\rho = 0{,}175)$, so this relationship can be characterized as a slight positive relationship. This shows that we can claim with high probability that the buyers of organic products are of high purchasing power, but not that those who do not buy them, do not do it just because of lack of money. Authors Kuhar and Juvancic (2010) came to similar results in their research on determinants that influence consumer behavior when buying organic products in Slovenia. The slight positive relationship between the observed variables is a consequence of the difference in the place of residence of the respondents. Namely, respondents in the Kosovska Mitrovica and Kosovo districts have higher average household incomes, which allows them to spend more money on the purchase of organic products, unlike respondents in the Kosovo – Pomoravlje and Prizren districts whose average household incomes are significantly lower. Also, a highly statistically significant relationship $(p = 0{,}031)$ was found between the variables *„frequency of purchases of organic products"* and *„years of respondents"* with the value of Pearson's coefficient $(\rho = -0{,}126)$, which indicates that there is a slight negative relationship between them, ie that older respondents are less likely to buy organic products and vice versa. The largest number of respondents over the age of 40 live in rural areas, the municipalities of Obilić and Vučitrn, as well as in the urban areas, the municipality of Leposavić. What is characteristic for this group of respondents is that in most cases they have only completed primary or secondary school, and this factor is directly related to consumer awareness of decisions to purchase organic products. Thus, the *„frequency of purchases of organic products"* is weakly but positively related to the *„level of education of respondents"* $(p = 0{,}000;\ \rho = 0{,}328)$.

Correlation matrix shows that there is a relationship between „*frequency of purchases of organic products"* and „*satisfaction with the supply of organic products*", which means that the greater the satisfaction with the offer of organic products, the more often organic products are bought. Male respondents are proved to be more satisfied with the offer of organic products on our market. This satisfaction is attributed to the fact that the male sex is an epithet for someone who is the „head of the house" and who has a higher average income compared to female respondents, which was confirmed

by this research. It is not easy to process a product that is authentic and that provides something new and different to consumers compared to those that can already be found on the market. The slightly negative corerlation $(\rho = -0{,}193)$ between „*satisfaction with the supply of organic products*" and „*nutritional value*" of organic products as the main reason for buying is highly statistically significant $(p = 0{,}002)$. Nutritional value is one of the most important reasons for buying organic products, but it is not the most important. However, younger respondents mostly cite nutritional values as the main motive for buying organic products. On the other hand, older examinees point out that the primary place, however, belongs to taste and the positive health impact that organic products have. In addition to the positive impact on health, nutritional values and all other attributes attributed to organic products, consumers expect the offer of organic producers to justify the premium price they are willing to pay. It is interesting that the respondents cail that they mostly buy organic products on the markets from people they trust, relatives or neighbors.

There is a very highly statistically significant correlation between the variables „*municipality to which you belong*" and „*type of production you have been engaged in*" $(p = 0{,}000;\ \rho = 0{,}034)$, which means that the respondents are engaged in the type of production typical for the municipality in which they live. The municipality of Zubin Potok is distinguished by its hilly and mountainous landscapes, and agriculture is the main activity of the population. An example of good practice in organic production is the agricultural cooperative „Zubin Potok", which was founded before the Second World War. This cooperative started dealing with organic food production in 2012, listening to the wishes and needs of consumers in the local market. Mr. Rade Utvić, director of the cooperative, points out the following in the conversation:

„We are not specifically engaged in organic production, but our subcontractors are, and do it for us. We cooperate with a dozen countries in Europe: Slovenia, Bosnia and Herzegovina, Macedonia, Montenegro, Albania, Austria, Germany, Switzerland, Italy, Bulgaria and Poland. The very process of production and processing of our products implies a strict ban on the use of pesticides and fertilizers, and what is allowed is the use of nettle as a natural growth stimulant with care and manual processing. Our cooperative offers 25 types of organic juices, 6 types of organic fruit spreads, 3 types of marmalade (pomegranate, dogwood and mixed) and beets. The largest export is directed to Germany, there we have 4 or 5 partners with whom we cooperate. Customers are very demanding, when it comes to organic products, they take care of the smallest details. What is interesting is that our cooperative is the winner of the „Ethnobrand 2018" award given by the Cooperative Union of Serbia, which is just another proof that good products have been widely recognized."

The correlation matrix also shows that there is a relationship between the variables „*age*" and the „*type of production*" that respondents deal with (Table 4). The bearers of agricultural farms in the enclaves are people of primary age who, primarily, take part in agricultural activities, while the younger population mostly migrates looking for better living conditions

with easier and better paid jobs and is not interested in cultivating the land. The exceptions are the municipalities of Obilić, Vučitrn and Leposavić, where most of the younger respondents are involved in classical or organic production. According to them, the feeling that you are „on your own" with the desire to „be your own boss" is the basic motive for the revival of Serbian farms in these municipalities. However, it is notably important to know that the village still remains as one of the options for dwelling place. As this study comprises mainly young and middle-aged people, it is assumed that any form of financial support would encourage them to be better at what they do, and thus certainly ensure survival in their hometown despite rather poor living conditions. However, the access to finance in agriculture and organic production has been identified as a limiting factor for development, in terms of fixed and variable inputs (Ljumović et al. 2015).

The results of the reserach highlight the relationship between the variable *„age"* and the attitudes of the respondents about whether *„engaging in organic production is possible in their immediate vicinity"* as a very highly statistically significant $(p = 0{,}001; \rho = 0{,}191)$. Organic production is present in almost all districts in Kosovo and Metohija, with certain oscillations. Low level of education, insufficient financial support, traditional habits and lack of support from younger family members are just some of the reasons that limit farms to engage in organic production.

Pearson's coefficient $(\rho = 0{,}261)$indicates a weak positive correlation between the variables *„arable land"* of organic producers and *„investment costs"* with high statistical significance $(p = 0{,}004)$. Investment costs as the main limiting factor in production, based on research results, directly affect the needs of organic producers to expand production capacity. This is especially true for organic fruit producers in the municipalities of Leposavić and Zvečan, bearing in mind that fruit types and varieties must be strictly adapted to local conditions. In contrast, producers of vegetable organic products in the municipalities of Gračanica and Novo Brdo face the problem of fragmentation of land, which is an obstacle to the development of sustainable production, cost-effective use of modern machinery and reducing production costs. Expenditures of organic producers can be offset by some form of subsidies from state or local authorities. Consequently, there is a highly statistically significant link between the variables *„arable land"* and *„subsidies"* $(p = 0{,}004;\ \rho = 0{,}268)$, which would encourage the development of organic production. Almost unanimously, all respondents pointed out that any form of subsidy would mean an incentive for the development of organic production. relatively small number of organic producers from the Kosovska Mitrovica district who cultivate up to 3 ha of land. Some of the reasons for refusing any form of subsidy are good average income and joint work of household members, so they can cover all costs incurred in production without the use of modern machinery With the production and placement of organic products on the local market, the enclave can generate surplus revenue and thus create an economic basis for sustainable development of multifunctional agricultural households in Serbian enclaves (Maksimović et al., 2015).

In general, organic food production is underdeveloped in the Western Balkans, despite numerous efforts. The countries of the Western Balkans, on their way to the European Union, are increasingly committed to mutual and joint cooperation. Taking into account the importance of the agricultural sector in the economic development of these countries, it is essential that this process brings the desired results in increasing competitiveness, improving regional trade, fostering food chain rehabilitation and economic growth (Volk et al., 2015). Good cooperation between the countries of the Western Balkans, in political, economic, environmental and other aspects, can significantly encourage the development of the agricultural sector, which in contemporary conditions of promoting the green economy can be reflected in increasing expansion and development of organic production in this area. However, almost all countries of the Western Balkans face insufficient financial support, and as one of the recommendations for further development in the field of healthy food production, in addition to direct payments per hectare and head of livestock / hive, measures to improve the quality of organic products are covered, as well as controls and certifications, procurement of grants and other support measures (Vehapi, 2019). The European Union Office is one of the major donors supporting the agriculture and rural development sector in the surrounding countries. Donations are continuously awarded to producers in Kosovo and Metohija and are focused on several programs, EURED III, Grant Scheme for the North I and II. So far, a total of 79 projects have been approved, of which 44 are aimed at agricultural and rural development. The distribution of projects by municipalities in the north of Kosovo and Metohija is represented in Table 5.

Table 5. European Union donations for the development of agriculture in the north of Kosovo i Metohija

Municipality	Number of approved projects in GS I and GS II	Number of projects for agricultural development in GS I and GS II	Projects for agricultural development (%)
Kosovska Mitrovica	19	2	10,5
Zvečan	16	8	50
Zubin Potok	12	10	83,4
Leposavić	29	24	82,7

Source: Study *„Are we living better?“,* InTER*,* 2016.

What is especially considered in organic production in Kosovo and Metohija is the cost-effectiveness in relation to conventional products. The question is whether the higher costs and lower yields that can be expected from organic agriculture can be compensated, that is, whether the purchasing power and awareness of the population for the use of environmentally healthy food is so great that this branch of agriculture is profitable? The ratio of profits and costs in organic production is not known to agricultural producers. In organic production, yields are significantly lower, so the achieved price premium is a key determinant of the attractiveness and profitability of organic agriculture (Kuhar and Juvancic, 2010).

Table 6. Comparison of prices of conventional products and prices of organic products in Kosovo and Metohija

Product	Amount	Average price of conventional product on the market (dinars)	Average price of organic product on the market (dinars)
Tomato	kg	80	140
Cucumber	kg	60	120
Raspberry	kg	400	650
Potato	kg	60	150
Watermelon	kg	70	130
Apple	kg	70	280
Plums	kg	60	190
Pear	kg	130	240

Source: Authors' research

Based on the research on the development of organic production in Kosovo and Metohija, a SWOT analysis was conducted in which the strengths, weaknesses, opportunities and threats to its implementation were presented.

Table 7. SWOT analysis of organic production in Kosovo and Metohija

STRENGTHS: ✓ the structure of agricultural land in Kosovo and Metohija is suitable for the development of organic production; ✓ interest of the population in organic production; ✓ high unemployment rate as a chance to start your own business; ✓ consumer awareness of how healthy organic products are; ✓ interest of foreign investors.	**WEAKNESSES:** ✓ lack of legal regulations; ✓ difficulties with certification of organic products; ✓ insufficiently developed market of organic products; ✓ weak cooperation between subcontractors; ✓ lack of subsidies.
OPPORTUNITIES: ✓ export of organic products with special emphasis on fruit products; ✓ placement of organic products in EU member states; ✓ placement of organic products in the countries of the Western Balkans, which strengthens cooperation between countries; ✓ the possibility of providing mutual support and exchange of experiences between subcontractors; ✓ organizing the first organic fair where organic products of producers from the territory of Kosovo and Metohija would be presented.	**THREATS:** ✓ an increasing percentage of the elderly population in rural areas; ✓ low level of competitiveness; ✓ poor marketing channels; ✓ the lack of education aimed at organic producers; ✓ insufficient support to producers in the conversion period.

Source: Authors' research

Conclusion

Organic production plays an important role in the economic and social development of Serbian farms in Kosovo and Metohija. Rich natural potentials, mostly rural areas, small areas of arable land and traditional families are just some of the characteristics that can intensify its application in the future. As organic production is most represented in the Kosovo ad Mitrovica District, and the least in the Prizren District, it is necessary to strike a balance, ie create a sustainable development program that will influence those engaged in agricultural production to slowly embark on the conversion process by which they would make ballance between the needs of the local market and local territory. Respondents were given the opportunity to express their opinion and give concluding guidelines that may be helpful to organic producers. The most interesting ones can be singled out:

- it is necessary to conduct mapping of plantations (registered and unregistered) in order to help individual producers south of the Ibar;
- an association of organic producers in the territory of Kosovo and Metohija should be established in order to exchange experiences;
- mandatory organization of seminars and additional education on the importance of organic products should be organized;
- a HUB information center for the development of organic production should be opened, where a younger population could be hired, while the older population would be mentoring;
- individual producers could be connected with small shops in order to exchange products;
- it should be insisted on the help of local and state authorities;
- greater financial support in the form of subsidies should be provided;
- pople should fight for a higher price of organic products;
- it should be established a stable market of organic products through joint cooperation of subcontractors from Kosovo and Metohija.

Due to the problems with land fragmentation, organic producers are advised to try to slowly and thoroughly build a production space on their land where the line between human activities and nature will be barely noticeable. In this way, great benefits can be left as a legacy to some future generations. However, in oder to achieve the aim to make organic production to fully flourish among households in Kosovo and Metohija in the coming period, the priorities must be to revitalize rural areas and retain young people in the countryside, which would inevitably lead to a better life and increase employment by investing in production and processing of organic products. Even though chance and ideas exist as basic drivers, it takes a lot of time and enthusiasm for organic production

to get its loyal caregivers and consumers, since their satisfaction and dedication is a reflection of the success of this concept, as the famous Ciceron once said, „*if we follow nature as a leader, we will never go astray.*“

Conflict of interests

The authors declare no conflict of interest.

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RURAL TOURISM DEVELOPMENT IN RASINA DISTRICT

Milica Žarevac Bošković[1], Marija Lakićević[2], Danijela Pantović[3]

**Corresponding author E-mail: zboskovic@asss.edu.rs*

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A B S T R A C T

The purpose of this paper is to present the current situation in the development of rural tourism in the Rasina district, as well as to suggest possible solutions to the recorded problems. For that purpose, empirical research was conducted in Lomnica, Kupci, Kukljin, Jasika, Gornji Stepoš, Naupare, Trmčare on a sample of 288 respondents who live in these places and are engaged in agricultural work and rural tourism. The data obtained through the survey of respondents was processed and the t-test for independent samples was applied, as well as the analysis of variance. The obtained results indicate that there are no statistically significant differences in the attitudes of respondents in relation to gender and age. Also, it was determined that the respondents are aware of the advantages and disadvantages of the area in which they live regarding the development of rural tourism. In line with this, support and cooperation of the public and private sectors are needed, to improve the existing potential.

Introduction

Agritourism has received growing academic attention over the recent decades (Dimitrovski et al., 2019). Rural tourism in the Republic of Serbia began to develop a few decades ago. Our country is rich in natural resources and cultural assets that make rural areas very interesting for both domestic and foreign tourists. Mild climate, clean air, and water resources further enrich our rural areas. However, there are many strategic problems that need to be solved in order for rural tourism in Serbia to reach its full potential.

1 Milica Žarevac Bošković, Ph.D., Lecturer at Academy of Professional Studies Sumadija Department in Kragujevac, Kosovska 8, 34000 Kragujevac, Serbia, Phone: +38169636222, E-mail: zboskovic@asss.edu.rs, ORCID ID (https://orcid.org/0000-0003-3839-3340).

2 Marija Lakićević, Ph.D., Associate Professor at Faculty of Hotel Management and Tourism Vrnjačka Banja, University of Kragujevac, Vojvođanska Street No. 5A, 36210 Vrnjačka Banja, Serbia,, E-mail: marijalakicevic@kg.ac.rs, Phone: +38162609204, ORCID ID (http://orcid.org/0000-0003-2169-7575).

3 Danijela Pantović, Ph.D., Assistant professor, Faculty of Hotel Management and Tourism Vrnjačka Banja, University of Kragujevac, Vojvođanska Street No. 5A, 36210 Vrnjačka Banja, Serbia,, E-mail: danijela.durkalic@kg.ac.rs, ORCID ID (https://orcid.org/0000-0001-8605-8614).

Rural tourism requires a well-designed marketing approach that will give young men and women the opportunity to get an education and a job in the areas they live. The most common problems in rural areas are the lack of adequate road infrastructure, as well as signalization, in order to make it easier for tourists to stay in these places. This is also very noticeable in the rural areas of the Rasina district, which will be discussed in more detail (Perić, Dramićanin, & Gašić, 2020). Rural tourism in the Republic of Serbia can play a key role in reducing the unemployment rate, diversifying the rural economy, protecting and improving natural and cultural resources, and revitalizing the countryside (Perić, Stojiljković, & Avramović, 2018).

Rural tourism can significantly improve the economic, social, and cultural progress of rural areas, and ecotourism especially increased human concern for the state of natural resources (Voza & Fedajev, 2020). Accordingly, it is necessary to adequately manage rural tourism, so that all participants in this process are satisfied.

"Contemporary trends in world tourism are looking for places where nature is fully preserved or living environment minimally altered" (Dašić, Živković, & Vujić, 2020). The modern tourist strives to gain new experiences, get to know the customs of other peoples, and get to know their culture while staying in peaceful areas, which are opposite to the stressful, urban areas from which he comes. This provides an opportunity to develop rural tourism in our country, as it has huge potential in the form of natural and cultural resources (Škrbić, Jegdić, & Milošević, 2018).

Rural tourism in our country is developed in a small area and does not have a clear form (Vukosav, Garača, & Bradić, 2018). Therefore, these areas are not in the process of any kind of development. Rural areas around the world are facing declines due to the outflows of people and population aging, lower basic skills, education levels, and lower average productivity. An example of this is the Rasina district (Xue, & Kerstetter, 2019).

Rasina district is located in the southern part of the Republic of Serbia (Stričević et al., 2015). It has a total population of 240,463 (2011 Census). The seat of the district is the city of Kruševac. In November 2021, Kruševac and its surroundings were visited by a total of 121,727 domestic and foreign tourists (RBS, 2021) which makes the Rasina district a much-visited area in our country. If we keep in mind that there are 291 rural settlements in the district, this area is very interesting for the study of rural tourism.

Materials and methods

The subject of paper is to analyze and describe the management of rural tourism development in the Rasina district. The aim of this paper is to determine the advantages and disadvantages of rural tourism in the Rasina district, with the aim of their further development. Scientific research methods of analysis and synthesis, as well as induction, deduction, and descriptive statistical methods, were used. One general and two special hypotheses are to be compared:

General hypothesis H_0: *Rural tourism in the Rasina district has a huge potential, but is not sufficiently developed*.

Special hypothesis H_1: *There are no statistically significant differences in attitudes towards the development of rural tourism in the Rasina District in relation to the gender of the respondents*.

Special hypothesis H_2: *There are no statistically significant differences in attitudes towards the development of rural tourism in the Rasina District in relation to the age of the respondents*.

For the purpose of testing the hypotheses, a survey was conducted on a sample of 288 respondents from the Rasina district who have agricultural holdings and/or are in some way engaged in rural tourism.

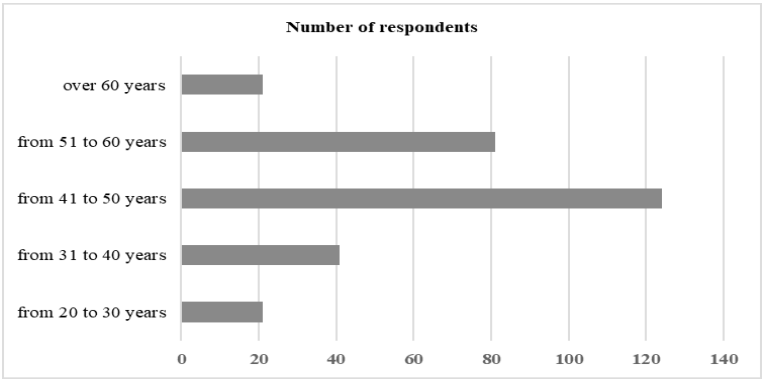
The research was conducted by the end of December 2021 and included filling in the questionnaire by the respondents. Survey data was collected using a survey technique, and the instrument is a questionnaire containing two variables related to the gender and age of the respondents. The questionnaire consists of two parts: the first part aims to determine the general socio-demographic characteristics of the sample of respondents, and the second part contains ten items related to the attitudes of the respondents towards the development of rural areas they live in; a five-point scale is used. The questionnaire was originally compiled by the author of this paper. The offered answers were formed according to the Likert scale. Respondents are aware that there are five degrees of agreement with each statement, namely: 1 - I do not agree; 2 - I partially disagree; 3 - I am undecided; 4 - I partially agree and 5 - I completely agree. In order to mark the agreement of their statements, it is stated that for each item, they should enter the appropriate order to mark their degree of agreement with that statement. They have been instructed to do so by writing a plus sign (+) in the appropriate place. To test the hypothesis, the t-test for independent samples was applied, as well as the analysis of variance.

Results and Discussion

The first part of the questionnaire refers to the examination of the basic socio-demographic characteristics of the sample of respondents, i.e. gender and age structure, level of education, as well as places of residence and occupation.

The study involved 193 males and 95 females. The age structure of the total sample of respondents is shown in the following Figure 1.

Figure 1. Numerical distribution of respondents in relation to age



Source: Author's calculation

Therefore, most of the respondents are aged 41 to 60 and older, which is the general demographic picture of villages in the Republic of Serbia.

When it comes to education level, most respondents have completed primary school – 49%, followed by secondary education – 37%, while 14% of respondents have a high school or college degree.

The survey respondents live and work in the following places in the Rasina district: Lomnica, Kupci, Kukljin, Jasika, Gornji Stepoš, Naupare, Trmčare. These rural settlements were chosen for research because of their size, easy access as well as their numerous natural, cultural assets and hospitality of the hosts.

In part of this section a comparison of respondents by gender in terms of attitudes about the development of rural tourism in the Rasina district is presented.

Table 1. Comparasion of the attitudes of male and female respondents in relation to the statement *Domestic tourists are our most frequent visitors*

Statement		N	M	SD	t	p
Domestic tourists are our most frequent visitors.	male	193	3.68	1.30	-.453	.651
	female	95	3.76	1.31		

Note: N - number of respondents, M - arithmetic mean, SD - standard deviation, t - statistics, p - statistical significance

** significance at the level of 0.01.

* significance at the level of 0.05.

Source: Author's calculation

The result of the t-test indicates that no statistically significant difference was found between male and female respondents (t (286) = -.453, p = .651) in terms of the degree of agreement with the statement *Domestic tourists are our most frequent visitors* (*Table 1*).

Table 2. Comparison of the attitudes of male and female respondents in relation to the statement *Foreign tourists are our most frequent visitors*

Statement	Gender	N	M	SD	t	p
Foreign tourists are our most frequent visitors.	male	193	2.58	1.44	-.052	.959
	female	95	2.59	1.34		

Source: Author's calculation

The result of the t-test indicates that no statistically significant difference was found between male and female respondents (t (286) = -.052, p = .959) in terms of the degree of agreement with the statement *Foreign tourists are our most frequent visitors* (*Table 2*).

Table 3. Comparison of the attitudes of male and female respondents in relation to the statement *Tourists stay on our farm and through us get involved in the life of the family and the whole village, get acquainted with customs and traditions, etc.*

Statement	Gender	N	M	SD	t	p
Tourists stay on our farm and through us get involved in the life of the family and the whole village, get acquainted with customs and traditions, etc.	male	193	3.64	1.40	-.427	.670
	female	95	3.72	1.32		

Source: Author's calculation

The result of the t-test indicates that no statistically significant difference was found between the two groups of respondents (t (286) = -.427, p = .670) in terms of the degree of agreement with the statement. Tourists stay on our farm and through us get involved in family life and the whole village, get acquainted with the customs and traditions, etc. (*Table 3*).

Table 4. Comparison of the attitudes of male and female respondents in relation to the statement *Tourists most often visit our farms to get to know or participate in agricultural work, enjoy the pure nature and get acquainted with the ethno content of rural areas*

Statement	Gender	N	M	SD	t	p
Tourists most often visit our farms to get to know or participate in agricultural work, enjoy the pure nature and get acquainted with the ethno content of rural areas.	male	193	4.09	1.20	.615	.539
	female	95	4.00	1.23		

Source: Author's calculation

The result of the t-test indicates that no statistically significant difference was found between the two groups of respondents (t (286) = .615, p = .539) in terms of the degree of agreement with the statement *Tourists most often visit our farms to get to know or participate in agricultural work, enjoy the pure nature and getting acquainted with the ethno contents of the rural area* (*Table 4*).

Table 5. Comparison of the attitudes of male and female respondents in relation to the statement *I believe that within the development of rural tourism, wine tourism in the Rasina district can be significantly improved*

Statement	Gender	N	M	SD	t	p
I believe that within the development of rural tourism, wine tourism in the Rasina district can be significantly improved.	male	193	3.84	1.22	-3.327	.001**
	female	95	4.26	0.90		

Source: Author's calculation

There are statistically significant differences between the two groups of respondents in terms of the degree of agreement with the statement (p=001). Namely, female respondents (M = 4.26, SD = 0.90) express a higher degree of agreement with the above statement compared to men M = 3.84, SD = 1.22). Thus, females are significantly more likely than men to believe that wine tourism can be improved within the development of rural tourism (*Table 5*).

Table 6. Comparison of the attitudes of male and female respondents in relation to the statement *I believe that the development of rural tourism can significantly improve gastronomic tourism in the Rasina district*

Statement	Gender	N	M	SD	t	p
I believe that the development of rural tourism can significantly improve gastronomic tourism in the Rasina district.	male	193	4.41	0.91	2.448	.016*
	female	95	4.06	1.24		

Source: Author's calculation

The results of the t-test show that there are statistically significant differences between the two groups of respondents in terms of the degree of agreement with the statement *I believe that the development of rural tourism can significantly improve gastronomic tourism in Rasina district*. Namely, male respondents (M = 4.41, SD = 0.91) express a higher degree of agreement with the stated statement in relation to women (M = 4.06, SD = 1.24). Thus, males are significantly more likely than women to believe that gastronomic tourism can be improved within the development of rural tourism (*Table 6*).

Table 7. Comparison of the attitudes of male and female respondents in relation to the statement *I believe that within the development of rural tourism can be significantly improved event tourism in the Rasina district*

Statement	Gender	N	M	SD	t	p
I believe that the development of rural tourism can be significantly improved event tourism in the Rasina district.	male	193	2.80	1.25	.156	.876
	female	95	2.78	1.20		

Source: Author's calculation

T-test indicates that no statistically significant difference was found between the two groups of respondents (t (286) = .156, p = .876) in terms of the degree of agreement with the statement *I believe that within the development of rural tourism can be significantly improved event tourism in the Rasina district* (*Table 7*).

Table 8. Comparison of the attitudes of male and female respondents in relation to the statement *Agricultural production in my village is the main production activity, which is the basis for the development of rural tourism*

Statement	Gender	N	M	SD	t	p
Agricultural production in my village is the main production activity, which is the basis for the development of rural tourism.	male	193	3.91	1.50	-3.254	.001**
	female	95	4.43	1.15		

Source: Author's calculation

The results of the t-test for independent samples show that there are statistically significant differences between the two groups of respondents in terms of the degree of agreement with the statement *Agricultural production in my village is the main production activity, which is the basis of rural tourism development* (t (286) = -3.254, p =. 001). Namely, female respondents (M = 4.43, SD = 1.15) express a higher degree of agreement with the above statement compared to men (M = 3.91, SD = 1.50). Thus, members of the female sex, to a much greater extent than men, believe that agricultural production in their village is the main productive activity that is the basis for the development of rural tourism (*Table 8*).

Table 9. Comparison of the attitudes of male and female respondents in relation to the statement *The village has a modern tourist infrastructure (info-boards, tourist trails, facilities for food, entertainment, information, culture and education, sports and recreation)*

Statement	Gender	N	M	SD	t	p
Rasina district has adequate tourist infrastructure.	male	193	1.86	1.20	-.301	.764
	female	95	1.91	1.19		

Source: Author's calculation

The result of the t-test indicates that no statistically significant difference was found between the two groups of respondents (t (286) = -.301, p = .764) in terms of the degree of agreement with the statement *Rasina district has adequate tourist infrastructure.* (*Table 9*).

Table 10. Comparison of male and female respondents regarding the *statement The road infrastructure to my village is excellent: the roads are good and signs on them are clear to foreign tourists*.

Statement	Gender	N	M	SD	t	p
The road infrastructure to my village is excellent: the roads are good and signs on them are clear to foreign tourists.	male	193	1.59	1.10	-.182	.856
	female	95	1.61	1.10		

Source: Author's calculation

The result of the t-test indicates that no statistically significant difference was found between the two groups of respondents (t (286) = -.182, p = .856) in terms of the degree of agreement with the statement *The road infrastructure to my village is excellent: the roads are good and signs on them are clear to foreign tourists* (*Table 10*).

In part of this section, it is shown a comparison of respondents by age in terms of attitudes about the development of rural tourism in the Rasina district.

Table 11. Presentation of the attitudes of respondents of different years in the opinion on the statement *Domestic tourists are our most frequent visitors*

Statement		Sum of squares	df	Average square	F	p
Domestic tourists are our most frequent visitors.	Between groups	5.504	4	1.376	0.811	.519
	Within groups	479.996	283	1.696		
	Total	485.500	287			

Note: df - degrees of freedom, F - statistician, p - statistical significance

Source: Author's calculation

No statistically significant differences were found between respondents of different ages in terms of the degree of agreement with the statement *Domestic tourists are our most frequent visitors* (F (4,283) = 0.811, p = .519). An analysis of average grades on a five-point scale shows that there is no difference between them (*Table 11*).

Table 12. Presentation of the attitudes of respondents of different years in the opinion on the statement *Foreign tourists are our most frequent visitors*

Statement		Sum of squares	df	Average square	F	p
Foreign tourists are our most frequent visitors**.**	Between groups	8.321	4	2.080	1.052	.381
	Within groups	559.679	283	1.978		
	Total	568.000	287			

Source: Author's calculation

No statistically significant differences were found between respondents of different ages in terms of the degree of agreement with the statement *Foreign tourists are our most frequent visitors* (F (4,283) = 1,052, p = .381). An analysis of average grades on a five-point scale shows that there is no difference between them (*Table 12*).

Table 13. Presentation of the attitudes of respondents of different years in the opinion on the statement *Tourists stay on our farm and through us get involved in the life of the family and the whole village, get acquainted with customs and traditions, etc.*

Statement		Sum of squares	df	Average square	F	p
Tourists stay on our farm and through us get involved in the life of the family and the whole village, get acquainted with customs and traditions, etc.	Between groups	1.522	4	.381	0.201	.938
	Within groups	536.478	283	1.896		
	Total	538.000	287			

Source: Author's calculation

No statistically significant differences were found between respondents of different ages in terms of the degree of agreement with the statement *Tourists stay on our farm and through us get involved in the life of the family and the whole village, get acquainted with customs and traditions, etc*. (F (4,283) = 0.201, p = .938). An analysis of average grades on a five-point scale shows that there is no difference between them (*Table 13*).

Table 14. Presentation of the attitudes of respondents of different years in the opinion on the statement *Tourists most often visit our farms to get acquainted or participate in agricultural work, enjoy the pure nature and get acquainted with the ethno content of rural areas*

Statement		Sum of squares	df	Average square	F	p
Tourists most often visit our farms to get acquainted or participate in agricultural work, enjoy the pure nature, and get acquainted with the ethno content of rural areas.	Between groups	4.951	4	1.238	0.846	.497
	Within groups	413.924	283	1.463		
	Total	418.875	287			

Source: Author's calculation

No statistically significant differences were found between respondents of different ages in terms of the degree of agreement with the statement Tourists most often visit our farms to get to know or participate in agricultural work, enjoy pure nature and get to know the ethno content of rural areas (F(4,283) = 0.846, p = .497). An analysis of average grades on a five-point scale shows that there is no difference between them (*Table 14*).

Table 15. Presentation of the attitudes of respondents of different years in the opinion on the statement *I believe that the development of rural tourism can significantly improve wine tourism in the Rasina district*

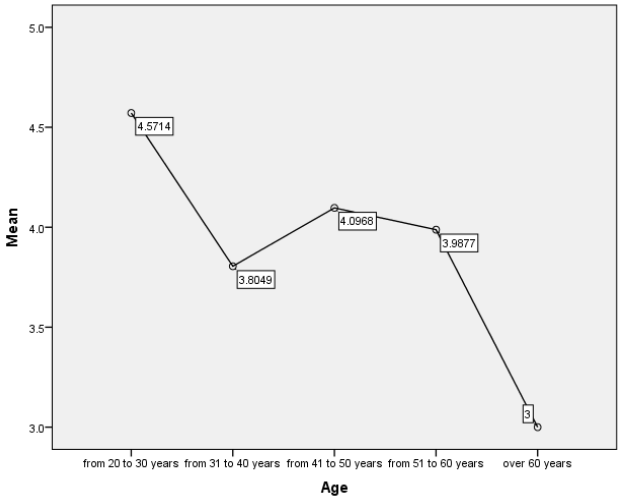
Statement		Sum of squares	df	Average square	F	p
I believe that the development of rural tourism can significantly improve wine tourism in the Rasina district.	Between groups	30.467	4	7.617	6.314	< .001
	Within groups	341.408	283	1.206		
	Total	371.875	287			

Source: Author's calculation

The results of the ANOVA test indicate that there are statistically significant differences between respondents of different ages in terms of the degree of agreement with the statement *I believe that the development of rural tourism can significantly improve wine tourism in Rasina district* - (F(4,283) = 6.314, p <.001). A follow-up test for multiple comparisons (Tuckey HSD) found that respondents over 60 years of age differed significantly from those aged 20-30, 41-50 and 51-60 in terms of having a slightly more reserved attitude towards opportunities for improving wine tourism within the development of rural tourism (*Table 15*).

Figure 2 shows the average scores that express the degree of agreement with the statement in relation to age. It can be noticed that respondents aged 20 to 30 have the most positive opinion (M = 4.57), followed by 41 to 50 (M = 4.10), 51-60 (M = 3.99), while the average score of respondents over 60 years of age is 3.00 (*Figure 2*).

Figure 2. Overview of the average score on a five-point scale of statement in relation to age (*I believe that the development of rural tourism can significantly improve wine tourism in the Rasina district*)



Source: Author's calculation

Table 16. Presentation of the attitudes of respondents of different years in the opinion on the statement *I believe that in the development of rural tourism can significantly improve gastronomic tourism in the Rasina district*

Statement		Sum of squares	df	Average square	F	p
I believe that the development of rural tourism can significantly improve gastronomic tourism in the Rasina district.	Between groups	3.377	4	.844	0.773	.543
	Within groups	308.943	283	1.092		
	Total	312.319	287			

Source: Author's calculation

No statistically significant differences were found between respondents of different ages in terms of the degree of agreement with the statement. *I believe that the development of rural tourism can significantly improve gastronomic tourism in the Rasina district* (F (4,283) = 0.773, p = .543). An analysis of average grades on a five-point scale shows that there is no difference between them (*Table 16*).

Table 17. Presentation of the attitudes of respondents of different years in the opinion on the statement *I believe that the development of rural tourism can be significantly improved event tourism in the Rasina district*

Statement		Sum of squares	df	Average square	F	p
I believe that the development of rural tourism can be significantly improved event tourism in the Rasina district.	Between groups	3.189	4	.797	0.520	.721
	Within groups	433.724	283	1.533		
	Total	436.913	287			

Source: Author's calculation

No statistically significant differences were found between respondents of different ages in terms of the degree of agreement with the statement. *I believe that in the development of rural tourism can be significantly improved event tourism in the Rasina district* (F (4,283) = 0.520, p = .721). An analysis of average grades on a five-point scale shows that there is no difference between them (*Table 17*).

Table 18. Presentation of the attitudes of respondents of different years in the opinion on the statement *Agricultural production in my village is the main production activity, which is the basis for the development of rural tourism*

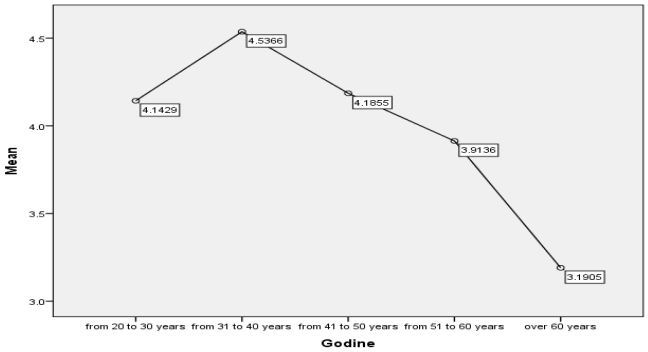
Statement		Sum of squares	df	Average square	F	p
Agricultural production in my village is the main production activity, which is the basis for the development of rural tourism.	Between groups	28.866	4	7.217	3.746	.005
	Within groups	545.134	283	1.926		
	Total	574.000	287			

Source: Author's calculation

The results of the ANOVA test indicate that there are statistically significant differences between respondents of different ages in terms of the degree of agreement with the statement *Agricultural production in my village is the main production activity, which is the basis of rural tourism development* - (F (4,283) = 3,746, p = .005). A follow-up test for multiple comparisons (Tuckey HSD) found that respondents over 60 years of age differed significantly from those aged 31-40 and 41-50 in terms of expressing a lower degree of agreement with the statement (Table 18).

Figure 3 shows the average scores that express the degree of agreement with the statement in relation to age. It can be noticed that respondents aged 31 to 40 have the most positive opinion (M = 4.54), followed by those aged 41 to 50 (M = 4.19), while the average score of respondents over 60 is 3.19 (*Figure 3*).

Figure 3. Overview of the average score on a five-point scale of agreement in relation to age (*Agricultural production in my village is the main production activity, which is the basis for the development of rural tourism*)



Source: Author's calculation

Table 19 Presentation of the attitudes of respondents of different years in the opinion on the statement *The village has a modern tourist infrastructure (info-boards, tourist trails, facilities for food, entertainment, information, culture and education, sports and recreation)*

Statement		Sum of squares	df	Average square	F	p
Rasina district has adequate tourist infrastructure.	Between groups	3.371	4	.843	0.587	.672
	Within groups	406.129	283	1.435		
	Total	409.500	287			

Source: Author's calculation

No statistically significant differences were found between respondents of different ages in terms of the degree of agreement with the statement *Rasina district has adequate tourist infrastructure* (F (4,283) = 0.587, p = .672). An analysis of average grades on a five-point scale shows that there is no difference between them (*Table 19*).

Table 20. Presentation of the attitudes of respondents of different years in the opinion on the statement *The road infrastructure to my village is excellent: the roads are good and the markings on them are clear to foreign tourists*

Statement		Sum of squares	df	Average square	F	p
The road infrastructure to my village is excellent: the roads are good and the markings on them are clear to foreign tourists**.**	Between groups	3.688	4	.922	0.763	.550
	Within groups	341.781	283	1.208		
	Total	345.469	287			

Source: Author's calculation

No statistically significant differences were found between respondents of different ages in terms of the degree of agreement with the statement. *The road infrastructure to my village is excellent: the roads are good, and the signs on them are clear to foreign tourists* (F (4,283) = 0.763, p = .550). An analysis of average grades on a five-point scale shows that there is no difference between them (*Table 20*).

From the conducted research and presented data, it can be concluded that general hypothesis H_o: *Rural tourism in the Rasina district has huge potential, but is not sufficiently developed* is confirmed. When we look at the obtained results and summarize the answers of the respondents, it can be noticed that all of them, regardless of gender and age, share their views on the development of the areas in which they live.

So, special hypothesis H_1: *There are no statistically significant differences in attitudes towards the development of rural tourism in the Rasina District in relation to the gender of the respondents* was confirmed, since only three of the ten claims examined showed a statistically significant difference in relation to the gender variable.

Special hypothesis H_2: *There are no statistically significant differences in attitudes towards the development of rural tourism in the Rasina District in relation to the age of the respondents* was confirmed, since only in two out of ten examined claims, a statistically significant difference was found in relation to the age variable.

Conclusions

Obvious conclusions can be drawn regarding the need to improve the management of rural tourism development and adopt an adequate strategy that will turn theoretical assumptions into reality. The significance of tourism development in contemporary society is not a need, but more a necessity (Pantić & Milojević, 2019). The *Covid-19* virus pandemic, which occurred two years ago, contributed to the closure of borders; however, it had its benefits for rural tourism within the countries (Polukhina et al., 2021). Namely, people turn to accessible locations and discover the beauties of their country, get to know customs that they did not know about until then, and participate in various events. The current subsidy from the state related to vouchers in the amount of RSD 5,000, in addition, helps to increase the number of visits by domestic tourists. Also, gastronomic specialties, brandy, and wines from the Rasina district have attracted many tourists, both domestic and foreign. They all enjoy watching the process from harvesting to preparing food and drinks and especially enjoy trying out the end products. However, the existing problems related to road infrastructure, poor signalization, lack of water and electricity in some villages, can have a very negative impact on the tourist perception of rural areas in the Rasina district. In this regard, it is necessary to make additional efforts so that the villagers live in better conditions, and thus be able to provide more to the development of rural tourism.

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Conflict of interests

The authors declare no conflict of interest.

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ECONOMIC EFFECTS OF APRICOT BRANDY PRODUCTION ON A FAMILY FARM

Bojan Dimitrijević[1], Branka Bulatović[2], Gordana Paunić[3]

**Corresponding author E-mail: bojandi@agrif.bg.ac.rs*

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ABSTRACT

In this paper the focus of the authors was on the economic performance of apricot brandy production, realized on a family farm. The aim of this research was to determine the economic profitability of apricot brandy production in years 2017, 2018 and 2019. The sources of data used for the preparation of this paper were the internal documents/ records of the family farm and the interviews conducted with family members. Contemporary scientific and professional literature relevant to the subject research was used as a theoretical basis. Several research methods were used in the paper, namely: observation method, content analysis, interview, descriptive method, calculation method, grouping method, and comparative method. The analysis showed that the production of apricot brandy on the family farm in the observed years was economically viable.

Introduction

Apricot originates from north-eastern China, where it was cultivated 5,000 years ago and from where it began to spread around the world. The dissemination of apricot to the West began during the military campaign of Alexander the Great in Turkmenistan, in the IV century BC. It was brought to our region in the time of the ancient Romans, and its cultivation to a greater extent began with the arrival of the Turks, from whose language the Serbian word for apricot "kajsija" originated (Milatović, 2013). It is highly valued by consumers around the world. Today it is grown in all Mediterranean countries, in Central and South Asia, South Africa and North and South America

1 Bojan Dimitrijević, Ph.D., Assistant Professor, University of Belgrade, Faculty of Agriculture, Nemanjina 6, 11080 Belgrade, Republic of Serbia, Phone: +381 11 44 13 336, E-mail: bojandi@agrif.bg.ac.rs, ORCID ID (https://orcid.org/0000-0002-5542-7007)

2 Branka Bulatović, Ph.D., Associate Professor, University of Belgrade, Faculty of Agriculture, Nemanjina 6, 11080 Belgrade, Republic of Serbia, Phone: +381 11 44 13 206, E-mail: brankal@agrif.bg.ac.rs, ORCID ID (https://orcid.org/0000-0003-1552-5494)

3 Gordana Paunić, BSc., City Administration of the City of Belgrade, Secretariat for Finance, Phone: +381 64 0280517, E-mail: paunicgordana@yahoo.com, ORCID ID (https://orcid.org/0000-0002-5676-1103)

(Greger & Schieberle, 2007). Fresh apricot fruits are valued as table fruit, but also as a raw material for the production of juices, jams, marmalades, sweets, compotes, etc. In addition, apricot fruits can be dried, as well as processed into brandy of excellent quality (Mratinić, 2012; Simić et al., 2021).

Brandy is a strong alcoholic beverage obtained by distillation of fermented fruit mash. It is assumed that the Serbian word for brandy – "rakija" is derived from the Arabic word "araki". Aristotle, in the 4th century BC, wrote about the process of distillation, and only later did Greek scientists describe primitive ways of obtaining something they called fire water (Malović et al., 2017).

For the production of fruit brandies, all fruit raw materials containing sugar can be used, from which ethyl alcohol (ethanol) is formed during the process of alcoholic fermentation. In the Republic of Serbia, the stone fruits (plums, apricots, peaches, cherries and sour cherries), apple fruits (apples, pears and quinces), berries (raspberries and blackberries), as well as grapevine fruits, are most often used for these purposes (Nikićević and Tešević, 2010). Herbal brandies are also made, which usually have apple, grape or plum brandy as a basis.

The process of extracting alcohol by distillation was introduced to Serbia with the Turkish invasion, at the beginning of the 15th century. At first, grape pomace brandy was made. Subsequently, the production of fruit brandies started, primarily from plum fruit. Fruit that was not eaten or processed into jams, marmalades, jellies was used for brandy.

The top quality of fruit brandies can be achieved by processing only fruits of good quality, i.e. those that are healthy and that are in the phase of full technological maturity. Satisfactory quality of brandy cannot be achieved by processing immature, rotten, mouldy or insufficiently formed fruits (Pischl, 2011). The fruit reaches full technological maturity at the moment when the maximum concentration of sugar and aromatic substances is achieved. At that stage of ripening, the fruit is the most suitable for the production of fruit brandies. Most varieties of fruit have characteristic aromatic substances, the processing of which produces brandies with characteristic aromas. Apricot brandy also has these properties.

The largest quantity of brandy in Serbia is produced on family farms. Brandy is produced to meet family's needs, as well as for sale. For Serbian population, manufacturing of brandy is also an opportunity to gather and socialize with family members, relatives, neighbours, friends. This ceremony takes place when there is no field work, in late autumn or during winter.

The subject of research in this paper is the economic performance of apricot brandy production, realized in a distillery, on a family farm, with primary fruit production, located in the city of Belgrade, in the municipality of Grocka.

The objective of the study was to determine the economic profitability of apricot brandy production in years 2017, 2018 and 2019.

Materials and methods

The sources of data used for the preparation of this paper were the internal documents/ records of the family farm and the interviews conducted with family members. Contemporary scientific and professional literature relevant to the subject research was used as a theoretical basis.

Several scientific methods were used in the paper, namely: observation method, content analysis, interview method, description method, calculation method, grouping method and comparison.

Results

In Serbia, a part of the harvested apricot is processed into brandy, which is named after it – "kajsijevača" (apricot brandy). It is obtained by distilling the mash/pulp of fresh fruits or apricots, with or without stones. The apricot fruit has a subtle and delicate scent and aroma which turn into brandy by distillation and give it specific organoleptic properties, which is why it is especially appreciated and recognized. It is consumed as a product of ethanol content of 40-45% v/v, often colourless. In order to express its likeable aromatic character, scent and taste, it should be aged for at least one year in an inert vessel. As it ages, over several years in an oak barrel, it gains in quality significantly. Then, in addition to its characteristic aroma, the well appreciated "bouquet" (aromatic quality, taste and scent) appears, which harmonizes well with the primary aroma of apricot brandy (Urošević, 2015; Leković et al., 2021; Pantić et al., 2019).

Apricot varieties of later ripening are more suitable for processing into brandy, these fruits contain more sugar and have a more pronounced aroma. Fruits intended for brandy are picked at full maturity or a little later, when they have the highest sugar content and the most pronounced aroma. The varieties of apricot that are most often used for the production of brandy are the Best Hungarian and Kecskemét rose.

The process of brandy production consists of the following operations:

- Mulching fruits and separating stones
- Boiling
- Distillation of fermented fruit mash/pulp
- Aging
- Finalization of brandy

The fruits can be used with or without stones, but better quality is obtained if the stones are removed. Separation of stones is done manually or by machine. For the destoning of fruits, the so-called destoning/straining machines are used. By using these machines, the stones are easily and well separated from the mesocarp that is also being well mashed, initiating the quick fermentation of the whole mass in such an environment and bringing it faster and more completely to the end of fermentation. Mashed mesocarp is easily transferred by pumps, which greatly facilitates all the operations.

The prepared fruits are placed in fermentation vessels. These can be stainless steel or plastic containers, concrete pools or wooden barrels. It is important that the dishes are well washed and cleaned before introducing the fruit. Fermentation vessels should not be filled above 80% of the volume (Urošević, 2015; Pantić et al., 2021).

Fermentation must take place without the presence of air, preventing the development of undesirable microorganisms and therefore a lid is placed over the fermentation vessel. The optimum fermentation temperature is 16-20°C. The duration of fermentation depends on the temperature and is usually 3-4 weeks. The course of fermentation should be monitored, so when it is finished, distillation should start immediately.

The distillation of the fermented mash is performed in devices that can be of different constructions and volumes. The best machines are made of copper. The parts of the distillation apparatus or cauldron are: the body of the cauldron, the lid-dome, the cap, the conduit tube, the cooler. The boiler of the distillation apparatus is filled with a fruit mash up to 2/3 of its volume.

Fresh distillates have a sharp, inharmonious taste and are not immediately suitable for consumption. Before use, the distillate needs to be aged for 3-6 months in glass or stainless steel vessels, during which complex chemical processes take place, and a colourless brandy is obtained. If ripening is done in oak barrels, golden-yellow brandy is obtained.

Finalization is the final preparation of the distillate for use and includes reducing the strength of the brandy/alcohol content by volume to 40-50% v/v by adding distilled water and filtering. After that, brandy is poured into bottles, bottles are closed with metal caps, labelled and packaged.

Depending on the amount of sugar and the share of stones, 10-16 l of apricot brandy is obtained from 100 kg of apricots.

Production of apricot brandy on the farm

Apricots and apricot brandy are produced on the agricultural farm located on the territory of the city of Belgrade, in the municipality of Grocka. This is a famous fruit region. Due to the very favourable geographical position and composition of the soil, the proximity of the Danube River, and the favourable air flow, Grocka has very good conditions for growing various fruit crops. Apricots, peaches, cherries, but also other continental fruit crops thrive best in these areas. The observed farm has a long tradition in the production of fruit and brandy. All members of the household are active, so there is no need to hire permanent additional labour, except seasonal workers who are hired as needed.

The owner of the farm also has a registered company for the production of brandy. The distillery started operating in 2009. The incentive for its opening was the fact that by producing brandy, members of the farm can earn significantly more income than by selling fresh fruit. The distillery produces apricot, plum, grape and peach brandies, according to traditional technology. It has a capacity of 16 tons of fruit in series. The total average annual production is just over 1000 litres. Raw materials for the production of plum and grape brandy are bought. The main product is apricot brandy, which is

entirely produced from apricot varieties Hungary Best and Kecskemét Rose, produced on the observed farm. They are late varieties in regard to the time of ripening, they have high sugar and dry matter content, as well as a good aromatic complex. The amount of brandy produced depends on several factors: the quantity and quality of apricots produced on the farm, market prices, brandy stocks, brandy demand, etc. The amount of raw material needed to obtain 1 litre of brandy varies from year to year, primarily depending on the amount of sugar and dry matter in the fruit. Sometimes 8-9 kg of fruit is needed for 1 litre of brandy, and sometimes 12-13 kg of fruit.

The main stages of production of high quality brandy are: selective harvesting of the highest quality fruit, processing, controlled fermentation and light distillation.

In the orchard of the agricultural farm, the harvest is done selectively and only ripe fruits are selected. After harvesting, the stones are separated from the fruit using a strainer machine. The mashed fruit is placed in a fermentation vessel.

The fermented mash, or fruit pomace, is pumped into the body of a copper cauldron that has been previously washed, and which is then closed, a fire is lit and the mash/pomace is heated to a certain temperature of alcohol evaporation. Alcohol vapours are collected in the lid of the cauldron and brought to the cooler via a steam pipe, where the vapour condenses into a liquid by cooling and exits the cauldron through a pipe into the receiving vessel.

Brandy is stored in glass balloon-like vessels, stainless steel tanks and wooden oak barrels. Numerous medals and recognitions from various festivals, fairs and competitions testify to the top quality of brandy produced in the observed distillery. The distillery mainly sells its products in restaurants and cafes in the city of Belgrade.

Business analysis

One of the main goals of agricultural farms is to generate income. By using certain inputs on the farm, a certain amount of product is produced. A part of the produced quantity is mainly used to meet the needs of household members, and the other part is placed on the market. On the observed family farm, in order to generate income, among other things, apricots and apricot brandy are produced.

In order to determine the amount of realized income from the sale of goods placed on the market, and then profit, and to measure the efficiency of using engaged resources, as well as the efficiency of using certain inputs in the production process to produce a certain amount of products (output) on the farm, it is necessary to conduct an economic analysis of the results of the observed production. One of the methods that is most often used as a basis for the analysis of the achieved results is the calculation of the production of the observed products. In order to conduct the highest quality analysis, it is necessary, as accurately as possible, to specify the quantities and value of inputs, i.e. costs of invested funds on the one side, and production results, yields, i.e. income, on the other.

The calculations of apricot brandy production in 2017 and 2019 are shown below.

Calculation of apricot brandy production in year 2017

In year 2017, the farm produced 700 l of apricot brandy with alcohol content by volume of 43.0% v/v. The total production costs amounted to 411,510.00 dinars, i.e. the cost of 1 litre of brandy was 587.87 dinars (Table 1).

Table 1. Costs of apricot brandy production in year 2017

Type of cost	Unit	Quantity	Price per unit (dinars)	Amount (dinars)
A. Materials				
Basic material - raw material	kg	7.000	30,00	210.000,00
Distillation (water, electricity, wood)				20.250,00
Redistillation (water, electricity, wood)				16.200,00
Distilled water	l			2.000,00
Total A.				**248.450,00**
B. Mechanical works				
Raw material processing	hour	6	1.010,00	6.060,00
Fermentation	hour	8	1.000,00	8.000,00
Depreciation of equipment				4.000,00
Total B.				**18.060,00**
C. Labour				
Production services	hour	130	461,54	60.000,20
Total C.				**60.000,20**
D. Other costs (bottling costs, excises, taxes, administration contributions)				85.000,00
Total D.				**85.000,00**
F. Total cost				**411.510,20**

Source: The authors

Of the total amount produced in the observed year, the farm sold 430 litres of apricot brandy at a price of 1,375.00 dinars and generated a total income of 591,250.00 dinars.

Calculation of apricot brandy production in year 2018

In year 2018, there was no production of apricot brandy in the distillery on the farm, because the yield of apricots was very bad, as a result of bad weather, especially frost during the apricot flowering period. This caused the price of fresh apricots to be high, so it was not profitable to use it for processing. Also, only the apricots produced on the farm are used in the distillery in the production of apricot brandy.

In year 2018, the farm sold 510 litres of apricot brandy, which was produced in previous years, at a price of 1,375.00 dinars, and generated a total income of 701,250.00 dinars.

Calculation of apricot brandy production in year 2019

In year 2019, the farm produced 680 l of apricot brandy with an alcohol content by volume of 40.0% v/v. The total production costs amounted to 381,510.00 dinars, i.e. the cost of 1 litre of brandy was 561.04 dinars (Table 2).

Table 2. Costs of apricot brandy production in year 2019

Type of cost	Unit	Quantity	Price per unit (dinars)	Amount (dinars)
A. Materials				
Basic material - raw material	kg	6000	30,00	180.000,00
Distillation (water, electricity, wood)				20.250,00
Redistillation (water, electricity, wood)				16.200,00
Distilled water	l			2.000,00
Total A.				**218.450,00**
B. Mechanical works				
Raw material processing	hour	6	1.010,00	6.060,00
Fermentation	hour	8	1.000,00	8.000,00
Depreciation of equipment				4.000,00
Total B.				**18.060,00**
C. Labour				
Production services	hour	130	461,54	60.000,20
Total C.				**60.000,20**
D. Other costs (bottling costs, excises, taxes, administration contributions)				85.000,00
Total D.				**85.000,00**
F. Total cost				**381.510,20**

Source: The authors

The farm sold 530 litres of apricot brandy, of the total amount of 680 l produced that year, at a price of 1,425.00 dinars and generated a total income of 755,250.00 dinars.

Analysis of apricot brandy production results

The total profit in agricultural production on the farm can be determined when the total costs (fixed and variable costs) are deducted from the total income. We can calculate the breakeven margin when we subtract variable expenses from the operating income.

Table 3 shows revenues, expenditures and gross breakeven margin by years.

Table 3. Revenues, expenditures and gross breakeven margin by years (dinars)

Year	Revenues	Expenditures	Gross breakeven margin
2017	591.250,00	411.510,20	179.739,80
2018	701.250,00	-	701.250,00
2019	755.250,00	381.510,20	373.739,80

Source: The authors

In the period from 2017 to 2019, the farm recorded an increase in income as a result of the commitment of each member, as well as better positioning in the market. What is specific about the production and sale of brandy is that it is not sold in the same year when it is produced, it is not sold, but put to age.

Production costs are presented with the market price of the raw material. Considering that apricots are produced on the farm and that the cost of apricots they produce is 12.00 dinars, and the market price is 30.00 dinars, we conclude that the profitability of fruit processing is higher than if apricots were purchased from other producers.

Indicators of business success in the production of apricot brandy

In order to calculate the economic efficiency of business operations in a certain accounting period, it is necessary to compare the achieved results with the results from the previous period, and to make a time comparison.

The economic result of business operation can be expressed per unit of invested or spent factors of production, and then it is possible to make a time comparison and calculate economic efficiency. The basic economic principles of business are: economy, productivity and profitability.

Productivity in apricot brandy production

Labour productivity is an important economic indicator of business success. By comparing business results with the volume of invested work, productivity indicators are obtained. The basic indicator of labour productivity (P_r) is calculated when the quantity of manufactured products and the volume of labour used are put into relation (Gogić, 2009).

Quantity of products obtained / Labour consumption = Labour productivity

In this way, the level of labour productivity is expressed naturally, i.e. the amount of products obtained per unit of labour used (Table 4).

Table 4. Productivity of apricot brandy production

Year	Quantity of products (liters)	Labour consumption (man hours)	Labour productivity (l/m.h.)
2017	700	144	4,86
2018	-	-	-
2019	680	144	4,72

Source: The authors

It was not possible to calculate labour productivity per working hour for year 2018 because apricot brandy was not produced in that year.

Economics of apricot brandy production

Economics means the economic benefit of the utilization/consumption of factors of the production process. The lower the consumption of production process factors for a certain volume of production, the greater the benefit of their consumption.

Economic efficiency is expressed by the coefficient of economics (E_k) and can be expressed as the ratio of production value and total costs:

Production value / Total costs = Production economy

The economics expressed in this way shows the amount of production realized per unit of costs incurred (Gogić, 2009).

Table 5. Economics of apricot brandy production

Year	Production value (dinars)	Total costs (dinars)	Gross breakeven margin (dinars)	Economic efficiency coefficient
2017	591.250,00	411.510,00	179.740,00	**1,44**
2018	701.250,00	-	701.250,00	**-**
2019	755.250,00	381.510,00	373.740,00	**1,98**

Source: The authors

The obtained results presented in Table 5 show that the coefficients of economics (E_k) are higher than 1, which means that the production of apricot brandy was economical. The cost-effectiveness ratio (EC) is on the rise. Namely, a higher coefficient of economics was achieved in 2019.

Profitability of apricot brandy production

Profitability is the ability to maximize profits with invested resources. Profitability is a basic prerequisite for growth and development. The goal of measuring profitability is to measure the efficiency of investment management.

Profitability of production (R_p), is expressed as the ratio of financial results and value of production (Gogić, 2009):

(Breakeven margin / Production value) x 100 = Production profitability

Profitability of apricot brandy production is presented in table 6.

Table 6. Profitability of apricot brandy production in years 2017 and 2019

Year	Production value (dinars)	Total costs (dinars)	Gross breakeven margin (dinars)	Production profitability (%)
2017	591.250,00	411.510,20	179.739,80	**30,40**
2018	-	-	-	**-**
2019	755.250,00	381.510,20	373.739,80	**49,40**

Source: The authors

The obtained results show that in the observed years, the production of apricot brandy was profitable.

Conclusion

Based on the economic analysis of apricot brandy production in a distillery on a family farm, it can be concluded that the obtained economic results are positive. Economic profitability was achieved by a favourable ratio of the selling price of apricot brandy and the cost price (producer price). By subtracting the incurred variable costs per litre of apricot brandy produced, 787.13 dinars remained in year 2017, or 863.96 dinars in year 2019, to cover fixed costs and make a profit (net income). The coefficient of economics shows that for every dinar of total costs of apricot brandy production, 1.44 dinars of production value was realized in year 2017, and 1.98 dinars in year 2019. In other words, the value of production was by 44% and 98% higher than the total costs, respectively, which indicates that it is a profitable production. In year 2017, 4.86 litres of apricot brandy were produced per working hour, and in year 2019, 4.72 litres of apricot brandy. In the observed years, production was profitable because the rate of profitability was 30.40 in 2017, and 49.40 in 2019. It was not possible to calculate the indicators of business success for 2018, because apricot brandy was not produced in that year.

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Conflict of interests

The authors declare no conflict of interest.

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A NEW MODEL OF RURAL DEVELOPMENT BASED ON HUMAN CAPITAL AND ENTREPRENEURSHIP

Darko Radosavljevic[1], Sonja Josipovic[2], Gordana Kokeza[3], Snezana Urosevic [4]

**Corresponding author E-mail: darko@tmf.bg.ac.rs*

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ABSTRACT

Rural development is one of the most important elements of the overall economic development. The level of entrepreneurship development, which is closely related to the available human capital of a certain area, has a particularly great impact on the speed and structure of the rural economic growth, along with outdoor amenities of rural areas. The paper provides an overview of foreign and domestic academic literature which deals with the issue of rural development and indicates the necessity and importance of achieving a stronger connection between rural outdoor amenities and the socio-economic development of rural areas. The paper also presents the results of the research aimed at the formulation of the relevant models of economic growth of rural areas in the 21st century. The aim of this paper is to point out the importance and possibility of implementing successful models of rural economic growth in Serbia.

Introduction

Rural development is one of the most important elements of the overall economic development, and the most important factors in this process are: the level of development and structure of industrial production, availability of the adequate human capital, availability of entrepreneurial capital, natural amenities of rural areas (geographical

1 Darko Radosavljević, PhD, Associate Professor, University of Belgrade, Faculty of Technology and Metallurgy, Karnegijeva 4, 11120 Belgrade, Serbia, Phone: +381658030024, E-mail: darko@tmf.bg.ac.rs, ORCID ID (https://orcid.org/0000-0003-0327-6216)

2 Sonja Josipović, PhD, Assistant Professor, University of Belgrade, Faculty of Technology and Metallurgy, Karnegijeva 4, 11120 Belgrade, Serbia, Phone: +38163330150, E-mail: sjosipovic@tmf.bg.ac.rs, ORCID ID (https://orcid.org/0000-0002-1091-4143)

3 Gordana Kokeza, PhD, Full Professor, University of Belgrade, Faculty of Technology and Metallurgy, Karnegijeva 4, 11120 Belgrade, Serbia, Phone: +381653207622, E-mail: gkokeza@tmf.bg.ac.rs, ORCID ID (https://orcid.org/0000-0001-8037-5985)

4 Snežana Urošević, PhD, Full Professor, University of Belgrade, Technical Faculty in Bor, Vojske Jugoslavije 12, 19210 Bor, Serbia, Phone: +381607150305, E-mail: surosevic@tf.bor.ac.rs, ORCID ID (https://orcid.org/0000-0002-6647-0449)

location, climate, relief), built amenities of rural areas (traffic, communication, social, tourist infrastructure, etc.), and heritage and cultural wealth.

The subject of this paper is the analysis of the importance of domestic outdoor amenities, human capital and entrepreneurial activities for the process of the economic growth and development of rural areas. The analysis of migratory movements, which have become especially important in recent years, from urban to rural areas in developed economies, pointed out that along with economic factors, the "quality of the rural environment" is influenced by outdoor amenities. Implementing a new approach to the rural development, defined as the rural industrialization, requires rural residents with high levels of human capital and commited to entrepreneurship. In the academic literature, entrepreneurship is recognized as one of the factors that can ensure the connection of knowledge, skills and creativity of the rural population with the economic growth and development. The concept of outdoor amenities is associated with the rural economic growth by determining the impact of human and entrepreneurial capital on a given growth.

Prerequisites for ensuring smart, sustainable and inclusive rural development are the protection and preservation of outdoor amenities of rural areas, the improvement of knowledge and skills of rural population and social capital, the application of new technologies, as well as the development of entrepreneurship and entrepreneurial spirit among rural population.

Characteristics and factors of rural development with special emphasis on the role of human capital

In addition to the natural amenities that characterize rural areas, development of entrepreneurship, which is closely related to the available human capital of a certain area, has a particularly great impact on the speed and structure of the rural economic development (Skuras et al., 2005; Markeson & Deller, 2012; Korsgaard et al., 2015). The realization of the adequate development of rural areas implies the application of such a growth model that can integrate the outdoor amenities of rural areas, human capital and entrepreneurial elements, and direct them towards the realization of the economic growth of a particular rural area. Empirical research to date (McGranahan & Wojan, 2007; McGranahan et al., 2011) shows that favorable outdoor amenities and the level of entrepreneurial activity in rural areas are factors that significantly, and often decisively, affect their economic growth, especially attracting the appropriate level of human capital.

The human factor has a dominant role in the movement of almost all elements of the economic development and growth, so is the case with the rural development. This is especially due to the fact that in recent decades there have been significant changes in this sector of human activity. Namely, rapid technical and technological development has conditioned high-speed and unpredictable changes in all spheres of human life. As a result, there was a change in the influence of certain factors on population movements, because the motives for the movements had changed. In earlier periods of

the development, migratory movements of the population were conditioned primarily by the economic factors such as: the possibility for employment and advancement, higher living standards, favorable real estate prices, and the like. That is why, at that time, cities were the most suitable places to live.

However, it is due to the rapid technological development and its impact, which can have both positive and negative consequences, that changes have taken place in many human activities, including migratory movements (Marcouiller & Clendenning, 2005). Overcrowded cities, pollution, the stress of living in such circumstances, etc., have caused that rural areas become increasingly desirable for living, rest and recreation. This is especially true for rural areas that are characterized by favorable outdoor amenities and significant human capital, because such areas have greater potential for growth and development. Moreover, favorable climatic conditions, relief, rich water and forest resources, etc. represent favorable conditions not only for the development of tourism and other accompanying economic activities in these areas, but also for the living. The development of information technologies, which has enabled many types of work to be done from any place in the world, has made rural areas even more attractive for permanent settlement. Therefore, the process of migration to rural areas increases the amount of human capital in them, which creates favorable conditions for faster and better rural economic and social development.

Regional economic development, and especially the development of rural areas, is one of the most important subjects of study of economists in recent times. A structural model of the regional economic growth has been developed by Deller et al. (2001), McGranahan (2011), Josipović (2018), Rikalović et al. (2020), etc. In developed models, rural amenities are seen as one of the factors of rural growth. The models start from the assumption that the growth of national income increases demand for areas with favorable outdoor amenities and other elements that improve living conditions. The results of empirical research indicate that four groups of factors affect the economic growth, and they are:

- market characteristics;
- availability of human capital;
- fiscal policy measures, and
- outdoor amenities (such as land, relief, water resources, the possibility of recreational activities and the level of infrastructure development).

The research concludes that the rural areas that have more favorable elements of outdoor amenities, as a rule, have faster population and employment growth, as well as higher per capita income, and thus better conditions for faster economic growth and development.

On the other hand, Wu & Gopinath (2008) and Deller (2009) analyze the influence of several factors on the creation of spatial differences from the perspective of the level of their economic development. The given factors include natural amenities, human and

physical capital of the analyzed area, geographical location, etc. The mentioned authors give a theoretical explanation and empirical confirmation of the correlation between the natural amenities of the environment and spatial differences, on the one hand, and the level of average income per capita and real estate prices, on the other hand. According to the offered theoretical model, it is concluded that the aim of an individual when choosing a location for living and working is to maximize the total utility determined by the *trade-off* between the amount of their income, the real estate prices and outdoor amenities of a particular location.

The analysis of the dependence of the economic growth on rural amenities indicated that rural amenities affect economic growth indirectly, via the impact on retaining the existing and attracting new rural residents. It is important to note that the most important part of the new rural residents are working age individuals who are highly educated and / or perform the so-called creative occupations (McGranahan and Wojan, 2007). They represent the highest quality core of the rural population and carry the greatest potential for development.

People with their education, knowledge, experience, skills and competencies make up the human capital of economic entities, which plays a very important role in the process of business, growth and development of these entities. When the role and importance of human capital in the process of rural development is considered, it can be noticed that the results of the research show that education, knowledge, creativity, skills and competencies of individuals in rural areas with a high level of human capital have a greater impact on the economic development of the area. The research (Wojan & McGranahan, 2007; McGranahan et al., 2011; Ulrich-Schad, 2015) conducted in the United States and the EU has shown that a significant number of highly educated individuals and members of the so-called creative class (Florida, 2014) are ready to move from cities to rural areas of high outdoor amenities because they see in them their chance to start a business. This is especially true for the population age group of 25 to 50, whose members move in order to live and work in more humane conditions. At the same time, the fact that most of these individuals have entrepreneurial ideas and are willing to take risks by investing in their business ventures is not negligible. On the other hand, the population aged 15 to 34 is the category that most often leaves rural areas with the intention of gaining higher education, building a career in more favorable conditions, as well as securing greater financial stability. From the above, it can be concluded that the category of the population aged 25 to 50 is the one that is ready to bear the greatest burden of rural development and that this category should be given the most attention when defining the rural development policy.

Undoubtedly, there is a mutual connection and conditionality between the amount of the human capital and the economic growth of an area (Kokeza & Urošević, 2012). However, the difficulty is reflected in the fact that the given impact is difficult to quantify. Thus, when researching the mutual conditionality of human capital and economic growth, the methodology of measuring the level of the human capital of a certain geographical area might become an issue. According to the traditional approach,

human capital is quantified through the level of formal education achieved by the population, i.e. the employed (Barro, 1991; Simon, 1998). This approach is based on the assumption that the most important investment in the human capital development is education, and the measure of human capital is the amount of knowledge available to individuals in the labor market. Knowledge is immanent to the individual, not to the branch of industry, and due to the process of clustering, i.e. grouping of highly educated individuals as bearers of knowledge, experience, skills, competencies, various talents and entrepreneurial abilities, the so-called externalities of human capital that significantly affect the acceleration of economic development are formed.

In difference to the traditional approach to the issue of human capital, a new concept was formed at the beginning of the 21st century, and that is creative human capital (Florida et al., 2008; Florida, 2014). According to this approach, the study of human capital is conducted through the analysis of the occupational structure of the employed. The fact is that both forms of human capital have their place and role in the process of economic growth and development, along with complementing each other.

Entrepreneurship as a driver of rural development

Economic growth and development are very complex processes that intertwine in the relations of interdependence and conditionality. The complexity of these processes stems from the fact that they are influenced by a very large number of economic and other factors, such as natural, technical, social, political, cultural, and others. The basic cell of economic growth is represented by companies, the basic subjects of the market economy. In companies, there is a realization of the business process, the creation of values, application and commercialization of innovations, as well as the manifestation of almost all elements of human capital. Entrepreneurship, as a skill of undertaking profitable ventures, also finds its foothold in a company, which then generates economic growth of the entire community (Kokeza & Stavrić, 2022). In modern conditions, the most important factors influencing high rates of economic growth are primarily resources invested in the process of knowledge creation (especially R&D), as well as developing skills and competencies needed to successfully start and run entrepreneurial ventures. The realization of high rates of economic growth implies synergistic action of innovation and entrepreneurial skills, in order to transform innovations from ideas into commercial products and services. All this can be achieved only by the adequate application of the appropriate elements of human capital, especially its entrepreneurial components.

The role and importance of entrepreneurial activities in the process of linking innovation and commercialization of innovation is also evidenced by the results of empirical research (Wennekers & Thurik, 1999; Acs et al. 2003) conducted in OECD member countries. The research data pointed to the fact that entrepreneurship is a necessary link that connects new knowledge, on the one hand, and the commercialization of the given knowledge in new business ventures, on the other hand. In a study conducted by Acs et al. (2003), a model of the entrepreneurial economic growth was developed, whose validity was assessed using econometric methods and panel models. These

assessment methods have shown that entrepreneurship has had a significant, positive impact on GDP growth over the last two decades of the twentieth century. The research also showed that the highest rate of economic growth in the observed period was in the countries that invested the most in R&D, as well as those countries that had a high share of entrepreneurs in the total number of the employed.

On the other hand, the research has also shown that high investment of resources in the field of R&D is not a sufficient condition for the realization of high rates of economic growth (Michelacci, 2003). Namely, the research conducted in the United States indicates that the lack of entrepreneurial skills of the working age population (measured by the share of the self-employed in the total number of employees) prevents satisfactory economic growth (measured by the unemployment rate and GDP), despite high investment in R&D (measured by the number of the registered patents and the percentage share of the residents engaged in R&D activities). It can be concluded that when initiating faster economic growth in rural areas, the appropriate attention must be paid to the adequate investments in the research and development, as well as to encouraging and developing entrepreneurial activities (Lee et al., 2004; Kokeza & Radosavljević, 2016). Without the connection of these two fields, the desired optimal goals of development cannot be achieved.

Although favorable outdoor amenities are the basis for the development of rural areas, they represent a necessary but not a sufficient condition for the given development to be realized. The conducted research also speaks in favor of this claim, i.e. it shows that favorable outdoor amenities are not enough for rural areas to achieve the adequate economic growth. Namely, the research data indicates that in the economy of developed countries, more developed rural areas are the ones which, in addition to rich outdoor amenities, have greater innovation, and in which entrepreneurship is present to a greater extent.

The results of the empirical research examining the impact of entrepreneurship on rural economic growth, as well as factors that encourage entrepreneurship in rural areas, show that a high level of entrepreneurial activities in rural areas has a significant positive impact on the economic growth of a certain area (Audretsch et al., 2008; McGranahan et al., 2011; Fritsch, 2013; Komarek et al., 2014; Josipović & Molnar, 2018; Rikalović et al., 2020). This is also confirmed by the fact that the greatest economic growth, employment rate growth, and growth in the number of small and medium enterprises and entrepreneurs during the 1990s in the United States were in the rural areas characterized by high outdoor amenities, but which also had a high level of human capital and entrepreneurial activities.

It is very important to point out that such development of rural areas has significantly contributed to the transformation of the entire national economy to a lower degree of dependence on traditional economic sectors (agriculture, mining, forestry, etc.), while contributing to more intensive development of manufacturing and tertiary activities (trade, services, rural tourism, etc.). At the same time, the contribution of human capital and entrepreneurship to these processes is very significant.

The activities of the service sector that give a particularly high contribution to the growth of entrepreneurial activities in rural areas with high outdoor amenities are the following: computer services, engineering services, legal services, financial and banking services, insurance services, accounting services and the like. The level and structure of the represented entrepreneurial activities in individual regions can be very different. These differences may be due to a number of factors, such as: the level of development of industrial production, the level of income of the population, available human capital, population density, unemployment rate, outdoor amenities and the like.

In the implementation of the entrepreneurial activities in rural areas, and especially when starting a business, other relevant empirical research (Gottlieb, 1994) shows that the main factors influencing the location of companies in rural areas are the adequate labor supply and market proximity, while the factors such as cheap labor, lower tax rates and taxes and the like, do not have a decisive impact.

Since entrepreneurial activities are closely related and conditioned by the elements of human capital, one of the new terms introduced in the articles dealing with the interconnection of human capital and entrepreneurship is *entrepreneurial human capital*. It represents the knowledge and skills (competencies) of entrepreneurs. The level of entrepreneurial human capital in rural areas is significantly influenced by both formal (level of education, training, various training courses) and informal elements (work experience, environment, business experience, etc.). As entrepreneurship focuses primarily on new profitable ventures, the question can be raised how attractive rural areas with their outdoor amenities are to attract and retain the highest quality entrepreneurs, i.e. to accumulate entrepreneurial human capital.

The theorists point to the fact that in rural areas there is a much greater connection between the economic goals of the entrepreneurs and the goals of the economic development of these areas than in urban areas (Harpa, 2017). The concept of rural entrepreneurship is especially important in rural areas that are characterized by high outdoor amenities, because these areas have significant comparative advantages for successful entrepreneurial ventures, especially in rural tourism, the organization of cultural and business events, realization of certain types of production and services. The role of entrepreneurs in these areas is reflected in the creation of new economic value by using specific combinations of local natural resources. It can be said that a rural entrepreneur is a type of manager who is ready for ventures associated with investment risk, but also with high profits if the investment proves to be successful. For these purposes, the rural entrepreneur is able to provide the adequate financial resources, human resources, material infrastructure, etc., but also to boldly apply innovative solutions where necessary and which are estimated as economically justified.

The main motive for entrepreneurial investments in rural areas is, first of all, the possibility of achieving appropriate profits, then using the comparative advantages of rural areas, and based on that, realizing monopoly profits, increasing employment of local population, but also better use of others, especially natural resources and

the like (Vuković et al., 2018). According to Korsgaard et al. (2015), the basis of rural entrepreneurship is the ability to adequately combine in the long run and more efficiently use specific resources of a particular rural area.

In the development of rural areas, the development and application of innovative solutions, the establishment and growth of new enterprises, which are also indicators of smart rural development of new enterprises (Naldi et al., 2015), are found to be particularly important. Entrepreneurship, which is an important carrier and implementer of entrepreneurial ideas, plays a crucially important role in this process. Depending on entrepreneurial abilities, it is possible to create new economic value by producing new products, providing new services, and introducing innovative business methods. All this can have a positive impact on promoting local economic, but also overall development of a particular rural area.

The research undoubtedly shows that rural areas, especially those with high natural amenities, have many advantages for the development of rural entrepreneurship, in comparison to the areas with low natural resources. The given advantages concern primarily natural resources, conveniences for the development of recreational activities, lower prices of land, labor and other resources, etc. However, doing business in rural areas also has certain limitations that often pose barriers to faster business development. These barriers are as follows: underdeveloped local infrastructure, limited market, low level of human capital, weak representation of necessary institutions, social and cultural factors, etc.

Modern tendencies of rural development indicate the necessity of fostering and implementing innovations and entrepreneurship in this process. Highly educated individuals, as an essential element of human capital, can contribute to the economic development of rural areas by moving to these areas, working, and applying their knowledge and creative ideas.

If entrepreneurial capital is defined as the ability of a particular entity to encourage and assist the implementation of new entrepreneurial activities through the provision of adequate forms of assistance, such as simplification and acceleration of various procedures, organizing various trainings within the rural population, providing more affordable financing, etc. (Audretsch et. al., 2008), then all these measures can develop rural entrepreneurial capital and thus contribute to the economic development of a particular rural area. The elements of entrepreneurial capital can also include the existence of the appropriate experience, tradition, natural and business environment, institutional environment, etc., which can positively affect entrepreneurial behavior and the determination to take risks of entrepreneurial ventures.

Human capital represents a remarkably important factor of the overall, as well as rural development, especially the part related to entrepreneurship. Entrepreneurial capital plays a vital role in linking the elements of human capital - knowledge and competences, on the one hand, and rural development, on the other. In the process of rural development with a special combination of knowledge and ideas, entrepreneurship can enable

greater inflow of funds, faster implementation and commercialization of innovations, employment growth of local people and thus increase their living standards, through the establishment of small and medium entrepreneurial companies. All of the above should contribute to faster and better economic growth in rural areas.

Model of economic growth of rural areas of Serbia

Rural areas of Serbia are facing a number of demographic, economic and social issues. Developmental disparities between rural areas in the north and rural areas in the south of the country are steadily growing. The demographic structure of rural areas belonging to the region of Šumadija and Western Serbia and the region of Southern and Eastern Serbia is more unfavorable compared to the region of Vojvodina. These rural areas have poorer performance in terms of demographic indicators compared to rural areas belonging to the Vojvodina region. Similarly, a number of these areas are facing structural problems regarding the current state of labor market performance. In contrast to the South Bačka region, which has the most favorable demographic structure[5], Kolubara, Pomoravska, Rasinska, Borska, Braničevo, Zaječar and Pirot areas maintain the worst degree of performance in terms of demographic indicators. Also, these rural areas (except Kolubara) have the most unfavorable position in terms of labor market performance, which is measured by indicators such as the rate of subsisted population, the rate of social importance of the young population, the rejuvenation population rate, the rate of substitution of the working age population, etc. The South Bačka area is also characterized by the highest gross value added per capita, whereas the Jablanica, Podunavlje and the Pčinja areas have achieved the lowest values. In addition to low gross value added, the Jablanica area is also characterized by the largest number of unemployed persons per thousand inhabitants.[6]

In contrast to less favorable demographic and economic performance, rural areas in Šumadija and Western Serbia, and the regions of Southern and Eastern Serbia show better performance in terms of social welfare indicators, such as rich natural amenities and preservation of the environment.

In the course of the last two decades, the development based on the use of domestic outdoor amenities has become a relevant development concept not only for developed countries, but also for countries that are late in transforming the rural economy such as Serbia. There is no universal definition as to what constitutes the concept of rural amenities. The concept can be seen as multidimensional, given that different definitions point to its different aspects. To comprehend it fully, it is important to look at the different components that make it up and whose number

5 Population density (152), participation of young population (15.48%), participation of working age population (69.26%), participation of population over 65 years of age (15.26%), change of population between two censuses in 2002 and 2011 (21,705).

6 For more on the state and performance of rural areas and the rural economy in Serbia, see: Josipović (2019).

expands as it becomes a significant factor in the socio-economic development of rural areas. At the very least, the concept of rural amenities can be observed through natural amenities. These amenities refer to the conditions of the natural environment and depict a clean natural environment as well as to attractive natural beauties that rural areas possess due to the rich natural resources and the world of wildlife. The concept of rural outdoor amenities is found to be broader than the concept of rural natural amenities. Given that natural resources can be used as inputs for a rich supply of recreational activities, an important component of the concept are recreational amenities. In addition to natural amenities, the concept of outdoor amenities refers to recreational amenities related to the construction of the appropriate infrastructure in rural areas, such as a modern road network and infrastructure related to providing a rich offer of various recreational activities in course of the year. In relevant academic literature, amenities are seen as non-market inputs of the production process of the local economy (Marcouiller, 1998).

Starting from the already performed regionalization of Serbia in accordance with the NUTS[7] classification, Josipović (2018), Rikalović & Josipović (2018), and Drobnjaković et al. (2022) have performed mapping and evaluation of locally specific outdoor amenities of Serbia by applying the methodology that resulted from the researched theory and conducted empirical research. The value of natural and total outdoor amenities of rural areas was estimated using the land valuation method based on the assumption that the differences in the suitability of the environment between rural areas are reflected in differences in property prices between rural areas that abound and do not own significant outdoor amenities. According to the empirical results (Rikalović & amp; Josipović, 2018), rural areas with high natural amenities are the three areas located in the Region of Šumadija and West Serbia (Raška, Zlatibor and Moravica) and the three areas located in the Region of South and East Serbia (Pčinja, Bor and Toplica). These rural areas (with the exception of Toplica) are also identified as rural areas with high outdoor amenities (Drobnjaković et al, 2022).

Although the size of the population generated by human capital and the volume of available entrepreneurial capital is found to be lower in rural than in urban areas, they are also recognized as the initiators of rural socio-economic development of Serbia. According to Josipovic & Molnar (2018) and Rikalović et al. (2020), education, knowledge, creativity and entrepreneurial skills can be significant drivers of economic recovery, diversification of economic activities and improvement of rural living conditions areas of Serbia, and, in particular, those with high outdoor amenities. The mapping of rural Serbia according to the level of human capital can be done by taking into account two indicators of the available human capital in a particular area which are generally accepted in the literature: the volume of the rural population with a university degree (Armington and Acs, 2002; Josipović & Molnar, 2018), and the size of the rural population performing creative occupations

7 NUTS - Nomenclature of Territorial Units for Statistics.

(McGranahan & Wojan, 2007; McGranahan et al., 2011; Josipović, 2018). Rikalović et al. (2020) have identified three major groups of employees who perform creative occupations in Serbia:

1. Legislators, senior officials and managers (e.g. Chief Executives, Senior Officials and Legislators; Administrative and Commercial Managers; Production and Specialized Services Managers; Hospitality, Retail and Other Services Managers);
2. Professionals (e.g. Science and Engineering Professionals; Health Professionals; Teaching Professionals; Business and Administration Professionals; Information and Communications Technology Professionals; Legal, Social and Cultural Professionals);
3. Technicians and Associate Professionals (e.g. Science and Engineering Associate Professionals; Health Associate Professionals; Business and Administration Associate Professionals; Legal, Social, Cultural and Related Associate Professionals; Information and Communications Technicians).

Most rural areas in Serbia are characterized by a larger population that performs creative occupations than the population that has a university degree. The exception is six rural areas[8], which are characterized by approximately the same size of the population with high levels of human capital quantified by using these two generally accepted indicators. In these rural areas, the share of employees with a university degree and the share of employees who perform creative occupations in the total number of the employed is approximately the same. Two rural areas with rich outdoor amenities (Raška and Pčinja), South Bačka, Pomoravlje, Šumadija and Nišava have the above average values of both human capital indicators. Given that the values of the human capital indicators for other areas of rich outdoor amenities are below the average, it is to be concluded that, in Serbia, the developmental potential of domestic outdoor amenities is still not recognized as well as their socio-economic role. The Raška area is the only area rich in amenities with a significant entrepreneurial activity, from which we can conclude that the outdoor amenities are not used as an instrument to attract human and entrepreneurial capital, as is the case in the developed countries of the EU and US. In addition to Raška, significant entrepreneurial activity is present on the territory of South Banat and Kolubara areas. The share of the number of entrepreneurs in the total number of the employed in these areas is about 30%.

Starting from the theoretical framework and research results on models of rural development with regard to their specific outdoor amenities, the Model of Rural Economic Growth of Serbia was developed (Josipović, 2018; Josipović & Molnar, 2019; Rikalović et al., 2020). The model is based on the assumption that due to the specific quality of the rural environment, the key factors of economic development of rural areas of Serbia can be education, creativity and entrepreneurial skills of the rural population. In order to empirically test this assumption, the model was evaluated three

8 Mačva, Rasina, Bor, Zaječar, Nišava and Pirot.

times depending on the way of quantifying the available human capital in rural areas in Serbia. Table 1 shows the results of testing the Rural Economic Growth Model of Serbia using appropriate econometric methods and panel models.

Table 1. Test results of the Rural Economic Growth Model of Serbia

Variables	First model		Second model		Third model	
	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
Human capital	8.137	0.002	3.827	0.052	6.881	0.010
Entrepreneurs	2.303	0.000	1.717	0.014	1.660	0.001
Human capital x Entrepreneurs	-0.103	0.002	-0.048	0.062	-0.091	0.009
Employment - Primary sector	1.677	0.000	1.573	0.000	1.663	0.000
Employment - Secondary sector	1.133	0.001	1.073	0.001	1.087	0.002
Employment - Tertiary sector	1.660	0.000	1.628	0.000	1.693	0.000
Employment - Quaternary sector	0.434	0.172	0.419	0.176	0.478	0.143
Working age population (15-65)	-1.484	0.000	-1.355	0.001	-1.174	0.008
Young population (0-14)	2.040	0.000	2.034	0.000	1.946	0.000
Rural areas with high outdoor amenities	-4.575	0.002	-3.772	0.007	-3.195	0.029
Rural areas with medium outdoor amenities	-1.891	0.228	-1.074	0.507	-0.613	0.706
Constant	-210.023	0.001	-687.766	0.016	-175.252	0.004
R2 (R2 adj.)	0.41 (0.35)		0.40 (0.34)		0.38 (0.32)	
F statistic	6.71 (0.00)		6.46 (0.00)		5.98 (0.00)	

Source: Josipović, 2018; Josipović & Molnar, 2018; Rikalović et al., 2020.

The first evaluated model observes the volume of human capital by rural areas through the employed population who has a university degree (the application of the traditional method of quantifying human capital). The second evaluated model is concerned with the volume of human capital through the employed population performing occupations belonging to the developed classification of occupations performed by representatives of the creative class in Serbia (the application of the creative class concept to measure available human capital in a particular area). The third evaluated model tests the significance of the part of the population equipped with human capital, which consists of the employed who hold a university degree as well as those engaged in occupations belonging to the classification of occupations performed by the representatives of the creative class in Serbia.

Relying on the presented results of the evaluation of the model of rural economic growth of Serbia, we can conclude that the initial assumption of the model has been confirmed. The employees who hold a university degree ($p < 0.05$, the first model), the employees who perform occupations defined in the literature on rural development as creative occupations performed by representatives of the creative class exert a significant and positive impact on the rate of economic growth in rural areas in Serbia ($p < 0.05$, the second model), and the individuals starting and running their own business ($p < 0.05$ in all three models). A negative placed in front of the variable of interaction between human capital and entrepreunership may indicate that in the case of rural areas with high outdoor amenities, two key preconditions have not been provided for establishing an appropriate model of economic growth, a significant part of the employed with high levels of human capital and a significant number of the employed who are carriers of entrepreneurial activity. This additionaly confirms the negative artificial variable related to rural areas with high outdoor amenities, which indicates that these rural areas have a lower rate of economic growth compared to rural areas with low outdoor amenities.

Since the research shows that natural resources will play a very important role in the future development of the world economy, and consequently, in the development of the domestic economy, as well as that they will be one of the most important foundations of development, the domestic economy must significantly change or adjust the approach to this area (Kokeza, 2017). The rich outdoor and natural amenities of the region of Šumadija and Western Serbia and the region of Southern and Eastern Serbia can contribute to ensuring the economic and social well-being of the rural population (Urošević et al., 2018; Kahrović et al., 2020). In order to effectively use the developmental potential of domestic outdoor amenities, it is necessary to provide conditions for social improvement (the improvement of living conditions of rural population, ensuring access to educational institutions, availability of health services, better conditions for raising a family, etc.), and economic improvement (per capita income growth, employment, entrepreneurial activities, etc.) of the rural population. Also, in the coming period, through the appropriate rural development measures and policies, it is necessary to provide incentives and support in order to use domestic outdoor amenities as an instrument to retain the existing and attract new rural residents who will be willing to use these amenities as basic input for initiating and leading own business.

Conclusions

This paper analyzes the impact of human capital and entrepreneurial activities on the process of economic growth and development of rural areas, which have gained importance in recent years. The paper particularly points out new approaches to rural development, which imply respect for the very important role of human capital and entrepreneurship in this process. Entrepreneurship is seen as a link between natural amenities, knowledge, skills, competencies and other abilities of the population and entrepreneurial ventures that result in more intensive economic growth of rural areas.

Consequently, we have concluded that the main preconditions for ensuring smart, sustainable and inclusive rural development are the protection and preservation of outdoor amenities of rural areas, the improvement of knowledge and skills of rural population and social capital, the application of new technologies and development of entrepreneurship and entrepreneurial spirit among rural population. We argue that the realization of the adequate development of rural areas implies the application of such a growth model that can integrate the outdoor amenities of rural areas, human capital and entrepreneurial elements and direct them towards the realization of economic growth of a particular rural area. The conducted research also indicates that when initiating faster economic growth in rural areas, the appropriate attention should be dedicated to the adequate investments in research and development, as well as to the encouragement and development of entrepreneurial activities. When it comes to the domestic economy, many negative factors of rural development are found (unfavorable demographic and educational structure of the population, insufficient diversification of economic activities, low quality of public services, low level of entrepreneurial activities of rural population, low per capita income), which prevent the usage of the developmental potential of domestic rural outdoor amenities, so they should be eliminated in the future. To ensure better rural economic and social development of Serbia, it is necessary to create an appropriate institutional environment (local educational and financial institutions) that will support the development of knowledge and skills of the rural population, as well as support for starting new and successful management of the existing rural entrepreneurial businesses.

Conflict of interests

The authors declare no conflict of interest.

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THE ROLE OF BRANDING AGRICULTURAL PRODUCTS IN BETTER MARKET VALORIZATION

Ozren Uzelac[1], Marijana Dukić Mijatović[2], Mario Lukinović[3]

**Corresponding author E-mail: marijana.mijatovic@uns.ac.rs*

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ABSTRACT

The purpose of this paper is to consider role of branding agricultural products in better market valorization. The benefit of branding is especially significant for rural and insufficiently developed environment. The problems of rural environments are multidimensional, but revitalization and improvement of development leads to strengthening competitiveness of these areas. The higher price of products enables the increase of income of agricultural workers, as well as diversification of the rural economy and creation of conditions of better socioeconomic aspects in rural environments. Creation of a more desirable image of an agricultural product most often has a strong reflection on the area of origin, as well as on reformation of the social attitude towards that environment. Branded products and services have a higher market value, due to which legal aspects enabling not only branding, but maintenance of a brand as well, are of special significance.

Introduction

The enormous competition has imposed the need for differentiation of products and services, and distinctiveness as a concept has risen to the fore. With the development of mass industrial production, trade, marketing and media, the need for marking products intended for wider markets arose as well, but also the process of their differentiation on the market (Ćemalović, 2019, 131). Average consumers cannot determine at first glance what product is of which quality, and thus they rely on their previous experience or the marketing message. This resulted in an increasing number of consumers buying

1 Ozren Uzelac, Assistant Professor, Faculty of Economics in Subotica, University of Novi Sad, Segedinski put 9-11, 24000 Subotica, Phone: +381 24 628 059, E-mail: ozren.uzelac@ef.uns.ac.rs, ORCID ID (https://orcid.org/0000-0001-6991-1644)

2 Marijana Dukić Mijatović, Associate Professor, Faculty of Technical Sciences, University of Novi Sad, Trg Dositeja Obradovića 6, 21000 Novi Sad, Phone: +381 21 450 810, E-mail: marijana.mijatovic@uns.ac.rs, ORCID ID (https://orcid.org/0000-0003-1327-0889)

3 Mario Lukinović, Associate Professor, Faculty of Law, University Union, 36, Marsala Tolbuhina Bulevard, Belgrade, Serbia, Phone: +381 64 1881922, E-mail: mario.lukinovic@pravnifakultet.rs, (https://orcid.org/0000-0003-1470-5872)

less and less of the given goods and services, and more of their image. Brands attract, but also maintain the consumers. The creation of a brand is being conducted through branding, through which the companies wish to create a certain image in the eyes of the consumers.

William Bernbach, one of the giants of American advertising, believed that "producers make products, and people buy brands" (Renvoise, Morin, 2007). Non-material goods have become more valuable than material ones (Gobe, 2010, 13). The market competition is not what is being made by companies in their factories, but what is being added to these products in the form of advertising, positioning, financing, etc. It is noticeable that many producers do not produce goods – others do it for them, but they brand it (Klein,2002, 16). Brands have become a commercial and cultural phenomenon (Olins, 2005, 62).

Brand

According to Cherry, "people buy certain goods not because of what they do, but also because of what they represent" (Denegro, 2014). Brand is a complex term consisting of many segments. No matter it is based on a product or a service, it contains legal elements (trademark, design, geographical indication of origin, patent, authorship), certain attributes (its material content, price, quality), as well as a marketing element used for gaining additional value through communication with consumers. A brand represents the sum of all associations evoked among consumers in relation to goods, services, company, certain personality or a state, including their reputation, image, as well as the visual and communicational identity (Šapić, 2004, 29).

In the process of constructing strong brands on the market, marketing, advertising and design are only a few of the channels used for sending a certain message. They are of essential significance for the creation of a competitive brand, but outside this circle, many other factors have the power to impact the attitude of consumers regarding certain products and services, and gaining control over them is hard. Social and societal impact of brands on feelings of consumers is based on psychological processes in the minds of consumers. The value of brands is founded in the readiness of consumers to pay more for branded goods in comparison to identical goods that are not branded. They enable product, goods, and company identification, but what is even more significant – their differentiation in comparison to competition (Anderson, Narus, 2008, 136). A good and positive brand is essential for competitiveness of products and goods on the market. Positioning on the market is most often conducted through brand image creation on the market (Gluhović, 2014, 87).

"Reputation is the foundation of competitive value, and due to that it is imitated with great difficulties" (Grgić, 2008; Lukinović, Dragojević, 2019). Reputation is not necessarily created through branding, but in the contemporary world, its existence or construction is almost impossible without that process. When choosing a product or a service, consumers do not make decisions solely on the basis of quality and the price of

the said product, but also based on their perception (Koteler, Gertner, 2014). Statistics show that more than 50% of consumers would rather pay a 20-25% higher price than replace their favorite brand (Neumeier, 2005, 100). Positioning is being conducted through taking a special place in the consciousness of a consumer within the targeted market segment through the act of offering and presentation of its image (Koteler, 2002, 202).

Branding

Due to enormous offers on the market, consumers are currently in a position that enables them to be increasingly demanding and picky. The brain of the contemporary consumer is filled with much information, and in order to preserve itself, it ignores the majority of them (Lindstrom, 2010, 16). The process of identification and promotion of products and services is being conducted through many different channels which, if articulated together, can be called product branding. The process of branding is compound and complex, including different aspects of communication with customers. Brand owners use the process of branding through marketing activities (commercials, advertising, promotions, etc.) to direct their activities towards the desired goal, depicted in a certain form of perception among the widest circle of consumers.

Relations between reputation, identity and brand of a certain area can be located within the borders of natural, social and cultural milieu. In the process of brand creation, image and reputation play quite a significant role (Morgan et al., 2014). The process of branding implies the use of many tools used for directing or rebranding the existing reputation within the scopes of the intended vision. There is an increasing number of individuals who wish to "improve, change, adjust, or in some other way direct their own reputation", through communication which implies the branding process (Anholt, 2014). Marty Neumeier defines the process of branding as attempts by a company to construct permanent values that will excite consumers (Neumeier, 2005, 19).

Trends on the market have for many years now been directed towards biologically more valuable agricultural products that are ecologically clean, and natural (Vlahović, Šojić, 2017). The massive scale, as well as the existence of roots within the community, resulted in easier acceptance and understanding of messages directed towards consumers (Todorović, 1996, 157), with effective influence of such type of branding. In order to achieve competitiveness and differentiation in comparison to similar products or services on the market, it is necessary to single them out through an expressed identity, different from the competition. Branding is a tool for the creation and promotion of a brand (Rakita, Mitrović, 2007, 10). The existence of a vast offer on the market has put producers in a position that, if they wish to place their product on the market, they must attract the attention of consumers and single themselves out from the competition. Brands have overruled the physical characteristics of a product (Lindstrom, 2005, 7). Products without brands are impersonal, and through the process of branding, they are differentiated and personalized, thus becoming unique.

Trademark

In theory and practice, there is often a confusion between terms trademark and brand. This confusion, above all, is the result of the dominant role of trademarks in brand creation and preservation, and well as the insufficient proficiency in legal terminology of marketing and other participants in creative brand creation. Brand is a wider term, most often implying the trademark as well. A trademark is a legal term used for marking the rights used for protecting the mark that differentiates goods (that is, services) on the market from the same or similar item offered by another natural or legal person. According to The Law on Trademarks 6/2020 (Serbia, 2020), a trademark can be consisted of any signs, especially of words, including personal names, or drawings, letters, colors, tridimensional shapes, shapes of goods or their package, or the combination of these signs or sounds. A trademark is acquired through registration with the body authorized for intellectual property rights registration. Trademark registration is not a legal obligation but a possibility offered to every natural or legal person who wishes to monopolize a certain mark. The name of the product, that is, service, as well as its logotype, colors and other elements that can be legally protected are most often, apart from design, the only visible elements of a brand for a consumer, and therefore, they are quite significant.

Marking goods with a trademark enables the consumers to recognize goods and attribute their producer or marketer a certain responsibility for products, and thus a sort of a guarantee for the expected quality of a product, which results in reduction of risk and complexity that are an integral part of the decision for buying the given product (Varga, 2010, 250; Leković et al., 2022). Without a trademark which enables goods and services identification, there wouldn't be a possibility of distinction, and thus favoritism over certain goods (Denegro, 2014, 24). Individualization of goods and services with the use of trademarks enables detection of its origin, that is, its producer, with the interest of protecting the average consumer from confusion on the market. Marking goods is rooted in the earliest history of the mankind, but only with the industrial revolution and occurrence of a variety of new products that were supposed to be presented on the market, the producers and merchants commenced more significant interaction with their consumers (Ind, 1992, 29).

Industrial revolution enabled the development of traffic and sudden growth of market which has, due to high demands, become rich in offers of same products, which led to development of competition and the need for improvement of marketing techniques, thus increasing the significance and value of trademarks. A trademark enables individualization of products and services on the market through their marking, and thus their differentiation in comparison to their competition as well (Krpan, 2014). The owner of a registered trademark acquires legal rights to forbid the use of the same or similar mark on the territory of countries where he is permitted to register the goods, depending on the types of goods and services approved for registration.

The symbolic and emotional value of a product is becoming more and more significant than its functional and generic function (Vrenješević, 2016, 13). Even in the nineties of the 20th century, professor Vesna Besarević noticed that the saying "quality sells goods" is overrated, and that, on the contemporary market, it can be replaced by the saying that "the goods are being sold by their trademark" (Besarević, 1984, 79). A registered trademark is not being used for protecting the product or the service, but the marks used for its marking and which make its visual identity. "Contrary to trademarks, which guarantee the continuity of quality, and which might even be constantly low or average, the guarantee function of geographical indications of origin are quantitatively more substantial since, apart for pointing the continuity of quality of the marked goods, geographical indications of origin also point to special features in comparison to the same product produced in some other place" (Lukinović, 2019, 181).

Industrial Design

Due to constant development, needs and demand of the market for changes, the significance of the role of design rose as well. From its initial role of being predominantly a packaging, design has become a first class means of publicity used independently for selling the goods it contains (Denegro, 2014, 27). Visual representation of goods through design is one of the key segments of the construction of identity of a certain brand on the market. Apart from the marketing function, the aesthetic characteristics of industrial design also have the differentiation function.

The majority of products have technical (material and method of production), functional (use and features of a product), aesthetic (external appearance of product), economic (production and market price) and psychophysical features (impression made on the consumer) (Fruht, 1987, 41).

High demand and wide offer have led to occurrence of self-service where consumers are given an opportunity to make independent decisions, which opened the field of "conflict" in which the producers wished to position as best as possible, sending a message to the consumers that their product is better than the competition. The external look of goods and their visual attractiveness have a significant impact on the decision-making process when speaking of purchasing a certain product, especially the goods of wide consumption (Lukinović, 2019, 166). In time, the designers developed a certain language of communication with consumers which, on a universal level, enables recognition of certain goods, their characteristics, use and even price (Lajfut, Gerstman, 2003). In the process of branding of products, an especially important role is played by visual elements; the form is not important only for the likeliness of consumers, but also for the message that can be sent by it to the consumers. Products communicate with consumers through their appearance.

The role of design is multiple – apart from attracting customers, it provides better marketing positioning and significantly contributes to defining, construction and shaping a brand, and a protected brand enables legal protection from unauthorized

copying and ensures the exclusiveness of its use, at the same time giving the opportunity of acquiring additional revenue by leasing the rights to design for a fee.

Through a formal procedure of registration of industrial design, its owner acquires exclusive rights and the ability to economically use the goods with visual characteristics (external features of industrial or handmade product) protected in an economic activity, its production and offer, selling of such product, import, export or transit of a product containing or using the design, as well as its storing. The said monopoly rights are being acquired through an administrative procedure before the Intellectual Property Office and are being ensured through the ability of adequate legal protection. Through registration, the holder of rights acquires exclusive right to protect their design from unauthorized copying and imitation by third parties (Lukinović, 2019, 171). Protection of industrial designs is territorially limited to the territory of countries where it is registered, lasting for 25 years from the date the registration application was filed. For the duration of its registration and on the territory of countries in which it is legal, "the holder of rights can make economic profit from different forms of use of design and conduct all actions directed towards this goal".

The aesthetic appeal to every individual is conditioned by belonging to certain social groups, but it is also closely linked to culture and the region from which it originates (Todorović, 1996, 153; Milojević et al., 2021), thus making the design of agricultural products acceptable faster to consumers.

Branding organic products

Evaluation of market research showed a shift in attitudes of consumers in comparison to emotions expressed towards brands. An increasing number of responders preferred products with pronounced ethical connotation (Lukinović et. al, 2017). Such attitudes are a result of raising awareness of the environment and ecological issues, as well as of products with higher health, dietary and hygienic standards. Moreover, better taste and higher quality are directly linked to organic products by an increasing number of consumers (Center for European Policies, 2015). Branding agricultural and organic products gains an additional value if it is based on authenticity if it is based on authenticity and tradition as essential elements of the identity that is being created. It should be a central point, a common ground gathering all producers of products with said characteristics from a specific area. The process of branding these products is most often initiated through the process of registration of a geographical indication of origin or collective trademark by a collective of producers. However, in order for a brand to truly start living, further support from local governments and the state is necessary when speaking of quality control and product certification, as well as its branding.

The growth of general concern for the environment, saturation with industrial products and care for personal health among a wider circle of consumers have developed the need for products for which it is believed to have certain features that guarantee better quality and wished organoleptic features. The majority of them relies on products that

are a result of tradition and local knowledge. The function of geographic indication of origin is similar to the function of trademarks, since both are used for differentiation of products on the market (Rački Marinković, 2013). In order to approve registration of geographical indication of origin, it is necessary the consciousness of the consumers has recognized special characteristics conditioned with natural and human factors of the region in which they are produced as a result of many decades of use. Geographical indications of origin rely on the strong belief of consumers that products marked by them have special features and quality, and thus also represent a powerful means of propaganda (Besarević, 1984, 87).

Quality schemes for agricultural products and foodstuffs

On the contemporary market, there is an increasingly pronounced wish of consumers for authentic products with special quality and based on tradition (Besarević, 1984, 87). In order to help the agriculturists and producers of traditional products with unique characteristics (Simović, 2015, 24), the comparative law recognizes different labels for marking such products. Depending on the form of legal protection, their powers vary. There are countries in which legal protection of these products is achieved through geographical indications of origin, others achieve it indirectly, through trademarks, especially through certification trademarks (Anglo-Saxon Law), while in certain number of countries, it is achieved through provision of law on unfair competition.

On the territory of the European Union, besides geographical indication, with the adoption of the EU Regulation No. 1151/2012 of the European Parliament and of the Council of November 2012 on quality schemes for agricultural products and foodstuffs, the issue of declaration of agricultural and dairy products was defined through introduction of quality schemes for products with specific characteristics for products that are a result of a special origin, specific ingredients or methods of growing and production. The quality scheme represents marks used for limiting the use of certain names of agricultural and dairy products with the goal of prevention of misconceptions among the consumers about their origin, nature and important features.1

Promotion of products based on their protected origin enables an increase in their market value. It is based on an additional value based on a long-standing trust of consumers. Legal protection protects producers from surrogates on the market, thus giving them the right to exclusive use of the names of products. Nobody outside this area can use the said name, which at the same time nourishes uniqueness and legal protection.

Among the countries in the region, Montenegro passed the Law on Quality Schemes of agricultural products and foodstuffs ("Official Gazette of the RCG", No. 22/2017) in which, the following is marked as quality schemes: appellation of origin, geographical indication, traditional specialty guarantee, indication of high quality, "mountain product" and "from my farm" label.

The quality schemes enable better representation of agricultural products with special characteristics through different levels of legal protection. Preservation of

characteristics of agricultural products and foodstuffs with the system of geographical indications is being enforced in more than 150 countries of the world, guaranteeing origin, production method, tradition, quality and product safety to the consumers (Lukinović et al., 2021). Collective term of geographical indication refers to appellation of origin and geographical indication. Appellation of origin is used for marking products with quality and special features exclusively conditioned with the geographical environment, including natural and human factors, and which production, processing and preparation is completely conducted in a specific area (state, region or locality). According to Law on Geographical Indications 44/2018 (Serbia, 2018), geographical indications are used for identifying products originating from a specific territory where a certain quality, reputation or other product characteristic can in essence be attributed to their geographical origin or which production and/or processing and/or preparation are conducted in a specific area. They represent a blend of tradition and identity of the region they originate from. Market valorization of these products is quite present on the territory of the European Union, where the products marked with these indications reach higher prices, ranging from 10 and 230% increase in price (vine) in comparison to the same products. Cheese in France, protected with a geographical indication of origin, are almost two euros pricier per kilogram in comparison to similar types of cheese, which impacts the purchase price of milk, and other factors in the production chain (Lukinović, Jovanović, 2019).

Geographical indications are acquired by registration with the Registry of geographical indications of origin and through administrative procedures before the authorized body. Their duration is not timely limited. By registering with the Registry, the authorized user acquires exclusive property authorization to forbid the use of the said geographical indication of origin. The status of the authorized user lasts for three years from the date of registration with the Registry, and it can be renewed unlimited number of times if all legal conditions are met cumulatively.

Contrary to our legal system, which does not recognize guaranteed traditional specialties, the European Union introduced this type of indications into their economic space. Guaranteed traditional indications of origin refer to agricultural products and foodstuffs produced in a traditional way (for the period of at least 30 years), that is, from traditional raw materials to which special features are attributed.

Republic of Serbia has grand potential in production of healthy and quality food, but in order to further develop this potential, suitable marketing support based on strategic positioning and perception of consumers when differentiating products is necessary (Mitić, Gligorijević, 2012). Development of special indications used for promoting additional value of agricultural products is significant in multiple ways for their producers. They are used for additional strengthening of trust of consumers, raising recognizability of the area from which the product originates, enabling protection from unfair competition, and reaching higher market value (Lukinović et. al., 2021).

The Decree on the labeling of agricultural products and foodstuffs with national quality label "Serbian Quality" 90/16 (Serbia, 2016) was introduced to our legal system as a voluntary quality scheme. This label can be used for marking agricultural products and foodstuffs that qualitatively differ from same type of products by their chemical content, physical, microbiological and organoleptic features, production method, used raw materials and/or ingredients, or by some other characteristic. Up until now, the Commission for Expert Assessment of special features of agricultural products and foodstuffs and determination of fulfillment of conditions for the use of "Serbian quality" quality label has passed a decision on the rights to use and labeling of nine products with this label.2

Quality schemes for agricultural products and foodstuffs

The identity in contemporary communications is acquired through a complex concept which includes branding, image construction and communication with consumers. The said statement imposes a wrong conclusion – that branding refers solely to cosmetics, simple and superficial aspects of communication, as well as the attributes of products and services themselves. Many producers, in a wish to place their products on the market as best as possible, take such, but wrong construction of brands into consideration. Such brands do not have huge perspectives, and if they at one point start shining on the market, success is transient. Moreover, eight out of ten products on the market fail after the first three months (Lindstrom, 2010, 39).

Put in a historical perspective, it is not easy to convince the consumers to trust a certain brand. Nowadays, when almost everyone understands the significance of brand and branding, vast number of producers wish to position themselves on the market through singling out their product from the competition, which results in a forest of brands in which a single tree is hardly visible. A significant part of customers bases their decisions also on previously acquired, often stereotypical images of quality or some other features of certain products originating from certain countries. However, given that producers allocate their production facilities to countries where their production expenses are lower, this line as well is becoming less and less significant, thus leading customers to return more and more to traditional values and source products. Such a trend can be quite significant for development of rural areas, given that producers accept faster and easier the features attributed to a certain product if they are rooted in tradition and originate from areas with trustworthy geographical characteristics. Features that can be attributed to agricultural products are closely linked with social perceptions of the area they originate from. Branding of agricultural products is an integral element of rural development which leads to diversification of local economy and strengthening of competitiveness and its further development.

Construction of a brand without adequate legal protection is like making a sandcastle on the sea shore. The system of intellectual property rights offers adequate protection to holders of this right through registered industrial design, trademark, geographical indication of origin, but as much as registration is an important step, by itself, it will

not bring any benefit to producers if they do not use this right. It is a strong monopoly rights in action against everyone (erga omnes), offering protection of the said rights in comparison to all parties. However, a big problem is also depicted in the fact that only a handful of agricultural producers have the status of authorized users of registered geographical indications. This depicts not only their disinterest, but also the lack of a comprehensive system of protection of these products, especially through the system of control and protection of labeled goods. Better inspection and monitoring would have a beneficial impact not only on agricultural producers, but the consumers as well, given that the quality of products would be guaranteed. It is undoubted that brands represent a strong marketing tool that can contribute to better market positioning of a product, and thus the attractiveness of consumers. They provide consumers with freedom of choice. Still, we believe that the highest value of brands can be reached in poorly developed and rural areas, where higher financial value of a product might be a generator of stability, but improvements as well.

Conflict of interests

The authors declare no conflict of interest.

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Table 1. The distribution cost of packaged goods from Subotica to retail-store objects

Indicators	Period			Total
	Month 1	Month 2	Month 3	
Distance crossed (km)	12.926	11.295	13.208	37.429
Fuel consumption (litre)	3.231	2.823	3.302	9.356
Value of fuel consumption (RSD)	242.378	211.790	247.653	701.821
Total time spend on touring (hour)	314	266	417	997
Value of total time spend on touring (RSD)	47.048	39.890	62.570	149.508
Number of tours	98	77	102	277
Toll value (RSD)	0	0	0	0
Number of pallets transported (piece)	1.179	976	1358	3.513
Total weight transported (kg)	602.600	429.225	711.116	1.742.941
Vehicle maintenance costs (RSD)	203.858	164.970	224.806	593.634
Lease costs (RSD)	480.938	454.214	565.784	1.500.936
Total sum (RSD)	974.222	870.864	1.100.813	2.945.899

Source: Petrović, 2012

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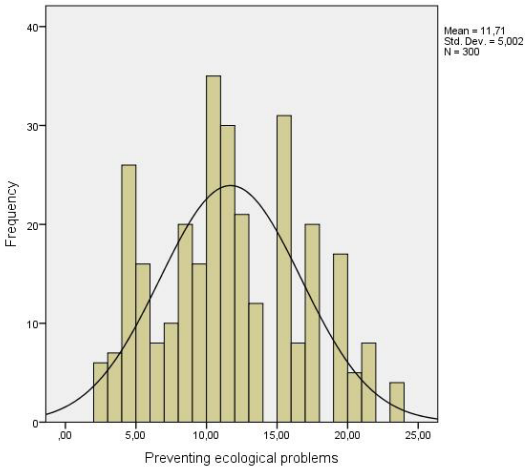
Figure 1. Agriculture, value added (% of GDP)



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