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CONTENT

PREVENTION OF WATER POLLUTION CAUSED BY NITRATES FROM AGRICULTURE IN SERBIA

Predrag Vuković [1], Vesna Popović[2], Jonel Subić[3], Nataša Kljajić[4]

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ABSTRACT

Knowledge of agricultural soil vulnerability to water and nitrogen losses is essential for designing management guidelines to minimize water pollution from agriculture. Here, the authors presented the results of assessing the intrinsic vulnerability of agricultural soil of the City of Pančevo (Serbia) to water and nitrogen losses using LOS indices method. As the most vulnerable, the indices, presented in the form of vulnerability maps, marked the northeast part of the City of Pančevo area, including part of Deliblato Sands. Determined closed periods for use of fertilizers, rules for soil application and balanced fertilization, optimized production structure and irrigation methods, application of contour ploughing and conservation tillage and maintenance of buffer strips are among the priority nitrogen best management practices (BMPs) for agriculture and water protection. Well-tailored, site-specific nitrogen BMPs based on the LOS analysis can significantly improve compliance with EU Nitrate Directive, which transposition is ongoing in Serbia.

Introduction

Water pollution by nutrients (nitrogen and phosphorus) have accelerated the rate and extent of natural process of surface waters eutrophication, which is characterized

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by harmful algal (including cyanobacterial) blooms (HABs), oxygen depletion and toxicity (Schindler, 1974; Smith, Schindler, 2009; Paerl et al., 2011; Paerl, Paul, 2012; Chislock et al., 2013).

Increased stream nitrate (NO_3^-) loading stimulates denitrification and concomitant nitrous oxide (N_2O) production[5] (Beaulieu et al., 2011). Nitrate is also the most ubiquitous chemical contaminant in the world's aquifers (Spalding, Exner, 1993). Shallow groundwater is particularly susceptible to nitrate contamination (Nolan et al., 2002).

These phenomena severely deteriorate water quality and ecosystem functioning and impair the use of water for drinking, agriculture, industry, recreation and other purposes (Carpenter et al., 1998). NO_3^- in water is toxic at high concentrations, has been linked to methemoglobinemia in infants and has shown toxic effects on livestock (Sandstedt 1990; Amdur et al., 1991).

Extensive use of nitrogen fertilizers and livestock manure in crop production is the largest diffuse source of pollution by nitrates, affecting surface and groundwater quality (Bouraoui et al., 2009; Haller et al., 2013). Agricultural point source of pollution by nitrates is related to improper management and safety practices in intensive livestock farming (Osterberg, Wallinga, 2004; Sahoo et al., 2016).

Prevention of nitrate pollution from croplands depends on increased nitrogen use efficiency[6], particularly on reduction of post-harvest soil nitrate content. Prevention of point source pollution on livestock farms is related to proper manure storage and maintenance of livestock facilities.

The EU Nitrates Directive (ND), as an integral part of the Water Framework Directive (91/676/EEC), is one of the key instruments in the protection of waters against nitrate pollution from agriculture.

The latest ND implementation assessments have documented the EU water quality improvement regarding nitrate concentrations. Based on annual averages of all reported fresh surface water monitoring stations in EU-27 in 2008–2011, 62.5% were below 10 mg/l of nitrate (NO_3^-), 2.4% showed concentrations between 40 and 50 mg/l and 2.4% exceeded 50 mg/l. Regarding groundwater, 14.4% of groundwater stations exceeded 50 mg/l of nitrate (NO_3^-) and 5.9% were between 40 and 50 mg. It is in both cases a slight improvement over the previous reporting period (EC, 2013).

The pressure from agriculture has decreased regarding the consumption of chemical fertilizers and livestock number, but some hotspots related to manure storage and

5 N_2O is a greenhouse gas that contributes to climate change and stratospheric ozone depletion. Using a global river network model, Beaulieu et al. (2010) estimate that microbial N transformations (e.g. denitrification and nitrification) convert anthropogenic N inputs to N_2O in rivers; this process leads to 10% of the global anthropogenic N_2O emission.

6 The ratio of N removed in the harvest to the N inputs from fertilizers, manures, N fixation, and other amendments (Davidson et al., 2015).

intensive horticultural production and associated with soil and geological formations (e.g. sandy and loess soils, as well as karstic and other porous rocks), have not been sufficiently addressed and require additional measures or reinforced actions.

According to the *Nitrates* indicator,[7] monitored in Serbia since 2004, the quality of surface water has constantly improved during 2008-2013. Median values ranged from 0.5-2 mg/l NO_3-N, corresponding to a good ecological status. Unfavorable (increasing) trend of nitrates was observed on 3 out of 56 measuring points. The quality of groundwater is monitored since 2004 at 29 measuring points. The quality of groundwater has constantly improved in the period 2009-2013. Excessive concentration, greater than 50 mg/l NO_3^-, was observed at one measuring point with favorable (decreasing) trend. In 2013, the concentration of 25 mg/l was not exceeded and in this year the quality was the best for the whole observed period 2004-2013 (SEPA, 2015).

Agricultural activities have a principal role in the generation of nitrogen emission in the Danube basin. The agricultural pressure could strengthen due to the expected stronger agriculture development in the future, especially in the middle and lower parts of the Danube. The non-EU ICPDR countries (including Serbia) are highly encouraged to implement best agricultural practices, similar to those required by the EU ND in the EU Member States (ICPDR, 2015). The largest source of nitrate pollution in the Danube basin in Serbia is overland flows[8] (56% of total annual nitrogen loads) and livestock, with a share of 26% (MAEP, 2014a).

Nitrogen cycling in soil is extremely dynamic and complex, especially the microbiological processes responsible for mineralization, fixation and denitrification of soil nitrogen (Ongley, 1996). Soluble and mobile, nitrate is prone to leaching through soil with percolated water. NO_3^- is also observed in surface runoff during rainfall events. The key hydrological processes that link precipitation, surface runoff and leaching have a decisive role in nitrate fate and transport (Ongley, 1996; Nolan et al., 2002; Böhlke, 2002; Van Drecht et al., 2003; Seitzinger et al., 2006; Leone et al., 2009; Puckett et al., 2011; Welch et al., 2011).

Nitrogen fate and transport modeling is essential in analyzing N flows and designing management guidelines to minimize surface and groundwater pollution. For nonpoint sources, spatial information on land use, climate, hydrology, geology and soils are combined with data on N inputs and outputs (Van Drecht et al., 2003). Nitrogen loads, transformation and transport also depends on different agricultural practices, including the ones related to crop types and crop rotation, soil tillage and residue management, irrigation and drainage techniques and use of various nitrogen fertilizers (Seitzinger et al., 2006; Aschonitis et al., 2013).

7 The indicator monitors the concentration of nitrate in rivers (NO_3-N) / groundwater (NO_3^-) and is calculated as the median of a range of average annual value of nitrate measured at measuring points. The existence and intensity of trend assessment is determined by Mann - Kendall test and Sen'S non-parametric method.

8 Total CORINE land areas flows.

According to ND Annex 1, in applying the criteria for identification of polluted waters or waters at risk of pollution, it is necessary to take into account, inter alia, the physical and environmental characteristics of the waters and land as well as the current understanding of the behavior of nitrogen compounds in the water and soil.

The LOS indices methodology is developed in order to classify the vulnerability of agricultural land to water and nitrogen losses[9]. The indices were developed by multiple regression analysis using the GLEAMS v3.0 model[10] simulations for the reference field crop under various soil physical-hydraulic and biochemical properties, topography and climatic conditions as observed values (Aschonitis et al., 2012).

The indices were presented in GIS environment (vulnerability maps). The spatial integration of vulnerability maps in the decision support systems enables regional authorities to design policies for optimal agricultural development and water protection from the agricultural land uses (Manos et al., 2010; Aschonitis, Mastrocicco, 2017).

By signing the Stabilization and Accession Agreement (SAA), Serbia committed to gradual harmonization of domestic legislation with the acquis communautaire. The identification of agricultural lands with significant contribution to N pollution, delineation of these zones and a catalogization of best agricultural practices to control nitrate pollution are the main tasks within the EU ND transposition.

The LOS indices application, presented here, can considerably improve the results of these activities and the main aim of the paper is to contribute to this efforts. The results of assessing the vulnerability of agricultural land to water and nitrogen losses using LOS indices in the City of Pančevo (Serbia), presented in the following chapter,[11] enabled the authors to designate and suggest well-tailored, site-specific best management practices to control water pollution by nitrates from agriculture.

9 The most accurate methods to determine water and nitrogen losses from agricultural land are the process-based mathematical models but they require a high amount of (usually lacking) data while vulnerability indices use fewer and more accessible data but are based on subjective weights and rating. LOS indices, calibrated by regression analysis based on the results of the deterministic GLEAMS model, belong to combined methods (Aschonitis et al., 2012; Aschonitis et al., 2013; Aschonitis et al., 2016; Aschonitis, Mastrocicco, 2017).

10 GLEAMS (Groundwater Loading Effects of Agricultural Management Systems) is a process-based mathematical model developed for field crop areas to simulate the surface and bottom of root zone loadings of water, sediment, pesticide and plant nutrients deriving from different climate, soil and agricultural management interactions (Leonard et al., 1987; Knisel, Davis, 2000).

11 LOS method (Aschonitis et al., 2012), as well as the above-mentioned case study research (Cvijanović et al., 2012) were developed within the EU project EU.WATER Transnational Integrated Management of Water Resources in Agriculture for the European Water Emergency Control (2010-2012) (Arampatzis et al., 2012).

Materials and methods

To classify *the intrinsic vulnerability of the topsoil* (30 cm) to water and nitrogen losses via percolation and runoff and to develop the related vulnerability maps for agricultural land of the City of Pančevo (Serbia), the following LOS indices were used:

- LOSW-P (annual intrinsic rates of water losses through percolation, in mm $year^{-1}$),
- LOSW-R (annual intrinsic rates of water losses through surface runoff, in mm $year^{-1}$),
- LOSN-PN (annual intrinsic rates of nitrogen losses through percolation, in kg-N $ha^{-1}year^{-1}$) and
- LOSN-RN (annual intrinsic rates of nitrogen losses through surface runoff, in kg-N $ha^{-1}year^{-1}$).

The sum of total losses of water (LOSW-PR) is calculated as the sum of the total losses of water through percolation (LOSW-P) and surface runoff (LOSW-R) and the sum of total losses of nitrogen (LOSN-PRN) is calculated as the sum of the total losses of nitrogen through percolation (LOSN-PN) and surface runoff (LOSN-RN) (Aschonitis et al., 2012).

Regarding the topography of the study area, analyses were conducted using the Digital Elevation Model acquired from SRTM data (NASA Shuttle Radar Topographic Mission 90 m Digital Elevation Data) in raster format. Hydrometeorological data were provided by the Pančevo meterological station, Faculty of Natural Sciences, Novi Sad and meteorological station of the PDS Institute "TAMIŠ," Pančevo. PDS Institute "TAMIŠ" was the source of soil properties data, soil and water quality analysis and data on irrigation and fertilization practices while the main hydrologic data were provided by Pančevo water level station.

Study area

The city of Pančevo is located in the Republic of Serbia, in the south-west Banat, within the rivers Danube, Tamiš and Nadela and covers an area of 756 km^2 with 123,414 inhabitants.[12] As a consequence of intensive production and obsolete technologies in oil, chemical and petrochemical, starch, leather and food industry, Pančevo has been designated as environmental hot-spot in Serbia.

The mean annual temperature in this area is 11.3 °C while the average annual precipitation has a value of 643 mm, with two maximums – from the end of spring to early summer and from the end of autumn to early winter. Reference values for potential evapotranspiration are in the range of 689-715 mm.

12 2011 Census data (SORS, 2014).

As a part of the Pannonian Basin, the territory of Pančevo City has a low elevation and a mostly flat surface, gently sloping from northeast to southwest and in the direction of Tamiš and Danube river flows. There are three geomorphological units: 1) *loess plateau* (with an average altitude of 100 to 150 m above sea level), 2) *loess terrace* (75 - 83 m a.s.l.) and 3) *alluvial plain* (70 - 73 m a.s.l.). Carbonate and sandy chernozems cover 70.5% of the City territory, humogleys 14.3%, fluvisols 9.7%, semigleys 4.3% and alkaline soil (solonetz) 1.2%.

Surface waters consist of rivers Danube, Tamiš, Nadela and Ponjavica and the network of melioration canals.[13] Groundwater encompasses shallow (phreatic) and deep (artesian) water-bearing layers. The phreatic layer is thinnest in the alluvial plains where it ranges from 1 to 2 m, while at loess plateau reaches 15-20 m (30 m in certain localities). The artesian groundwater is found at greater depths, which makes it highly mineralized. Limited reserves of good-quality deep groundwater have been located at the edges of loess plateau and Deliblato Sands.

Utilized agricultural area[14] (UAA) occupies 53,187 ha of the City territory (70.4%), of which kitchen gardens cover 0.4% of UAA, arable land 97.8%, orchards (apples, apricots, cherries, peaches) 0.9%, vineyards 0.1% and meadow and pastures 0.6%. Large farms, with more than 20 ha of UAA (8% of the total number of farms with UAA) use 67.6% of total UAA.

In 2011/2012 crop year[15], 70.8% of arable land was engaged in cereals production (maize, wheat), 23.2% was covered with oilseeds (sunflower, soya), 2.6% with sugar beet and 2.3% with fodder crops. Vegetables (cabbage, sweet pepper), melons and strawberries occupied 0.4% of arable land as well as medicinal herbs. The potato fields covered 0.2% of UAA.

The production and yields in rain fed crop farming have strong yearly oscillations, mostly due to more frequent and longer draught periods. Irrigation systems are underdeveloped and despite the high availability of water, irrigation is applied sporadically to very limited area, mostly under maize and other cereals, vegetables,[16] melons and strawberries and potatoes.

In 2011/2012 crop year, conventional tillage was used on 46,943 ha (91.8% of arable land[17]), reduced tillage on 8.0%, and zero tillage on 0.2%. More than 90% of arable land was in crop rotation. Winter crops were sown on 8,309 ha (16% of arable land) and cover crops only on 11 ha. Crop residue mulch was applied on 2,417 ha (5%). Bare soils covered 79% of arable land area. Less than 2% of agricultural holdings with UAA

13 Alluvial terrains are vulnerable to high groundwater after the construction of Iron Gate hydroelectric power plant.

14 2012 Census of Agriculture data (SORS, 2015).

15 Ibid.

16 In vegetable production drip irrigation amounts to 200 - 400 mm (PDS "Tamiš" data).

17 Arable land producing crops requiring annual replanting, without greenhouses.

built and/or maintained hedges, hedgerow trees and dry stone walls as field margins in the three-year period preceding the 2012 Census (SORS, 2015).

According to 2012 Census of Agriculture data, livestock production is poorly developed, but the livestock farm capacities are growing. There were 5,504 heads on 363 farms in cattle breeding of which only seven farms had 3,943 cattle. In pig production, 42,917 pigs were bred on 3,584 farms but nearly half of them were bred on four large pig farms. A total of 340,195 heads of poultry was bred on 4,044 farms. More than half of this number was in flocks of six large producers.

The largest number of farms that stored solid manure solely stockpiled it (96.8%), 1.7% owned stacking pads (exposed 0.5% and roofed 1.2%), and 1.5% used both solutions. A small number of farms stored liquid manure and slurry, mainly in open lagoons and tanks (SORS, 2015).

The consumption of nitrogen fertilizers (in nutrient per hectare of arable land and permanent crops) in the Republic of Serbia has recovered since the nineties and, according to 2014 FAO Statistical Yearbook data, in 2009 amounted to 91 kg/ha.[18]

In the City of Pančevo, nitrogen fertilizers were used in the range of 80 kg-N/ha/year (sunflower) up to 140 kg-N/ha/year (maize, sugar beet), in two applications (for sunflower one application) (PDS "Tamiš" data).

Soil and water quality tests, realized during EU.WATER Project (2010-2012), showed that land was in the categories[19] of *well supplied with nitrogen* up to *reach in nitrogen*, while nitrate content in waters was in the range of 0.58-0.85 mg/l NO_3-N, far below the limits established in national regulations (Cvijanović et al., 2012).

Results and discussion

LOSW indices, applicated in the City of Pančevo case study, showed that the water losses through percolation under the root zone of the 30 cm of soil profile (LOSW-P) are lower for agricultural land near the river, where alluvial soils dominate, and increase moving to the east to the Deliblato Sands, due to the transition from alluvial soils to sandy chernozem.

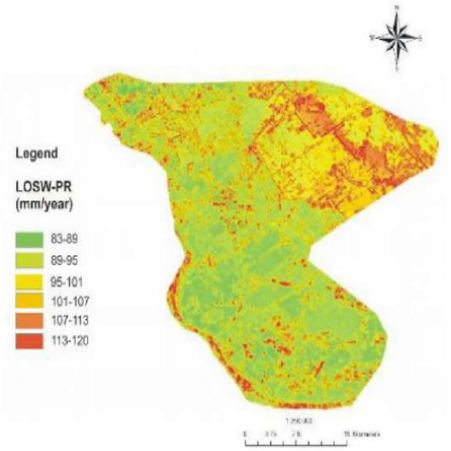
Water losses through surface runoff (LOSW-R) are higher at the western part of the area due to higher slopes while the medium values are registered in its central parts due to the low hydraulic conductivity (Cvijanović et al., 2012).

Regarding the total water losses (LOSW-PR), the eastern zone, along the edges of Deliblato Sands is designated as the most vulnerable (Figure 1).

18 The heaviest nitrogen fertilizer user in the EU-27 in 2009 was Ireland (332 kg/ha), followed by Luxembourg (211 kg/ha) and the Netherlands (206 kg/ha). Other heavy user of nitrogen fertilizers was Croatia (184 kg/ha) (FAO, 2014).

19 By Wohltmann (Džamić, 1966).

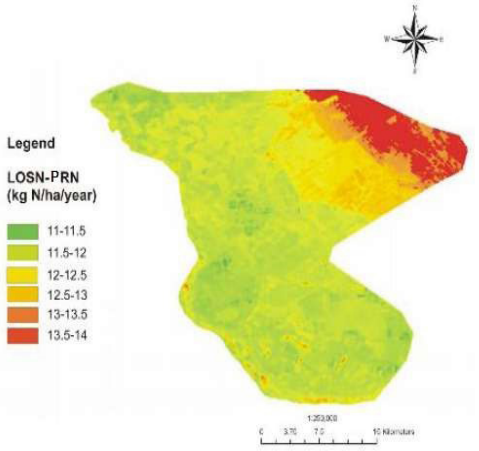
Figure 1. Annual total water losses from agricultural land in the City of Pančevo, the Republic of Serbia



Source: Arampatzis et al., 2012.

As in the case of water, nitrogen losses through percolation under the root zone of the 30 cm of soil profile (LOSN-PN) are lower at the Danube riverbank area and increase moving to the east due to the transition from fine texture, alluvial soils with low hydraulic conductivity to coarser, sandy soils with higher hydraulic conductivity. The distribution of nitrogen losses through surface runoff (LOSN-RN) is analogous to LOSW-R (Cvijanović et al., 2012). Regarding the total nitrogen losses (LOSN-PRN), the most vulnerable zone is detected upland in the northeastern area (Figure 2).

Figure 2. Annual total nitrogen losses from agricultural land in the City of Pančevo, the Republic of Serbia



Source: Arampatzis et al., 2012.

Considering the above, the northeast part of the City of Pančevo area, which includes part of Deliblato Sands, is identified as the most vulnerable to water and nitrogen losses.

Nitrogen transformations can be effectively managed by the entire set of management practices, designed to increase nitrogen use efficiency (NUE) and to decrease surface and groundwater pollution. The global fertilizer industry-led "4-R Nutrient Stewardship" concept based on scientific understanding of applying the Right source of nutrients at the Right rate, Right time, and Right place (Snyder et al., 2014) needs to be optimized at local and regional scales by engagement of many partners including farmers, crop advisers, scientists, policymakers, consumers, and the general public (Bruulsema et al., 2009). Techniques for improving NUE include controlled-release fertilizers and urease and nitrification inhibitors, improved soil and plant testing to match nutrient applications with crop demands, use of winter cover crops, adoption of precision agriculture technologies, improved irrigation management and increasing availability of decision support tools for farmers and crop advisors (Davidson et al., 2015).

According to the vulnerability maps presented above and current land use and conservation practices, the production and yields increases in Pančevo agriculture should proceed respecting the following priority nitrogen BMPs[20] to improve NUE and reduce nitrate leaching and runoff:

(i) *Determined closed periods for use of fertilizers, rules for land application under certain conditions* (water-saturated, frozen or snow-covered ground, near water courses, on sloping ground) and *balanced fertilization* (using soil testing, fertilizer plan and records on fertilizer use, real-time nitrogen-sensors and variable rate controllers for precision fertilizing,[21] controlled-release fertilizers and nitrification inhibitors, split applications and maximum application standards, and farm nutrient management plan with specification of storage requirements for livestock manure).

(ii) *Optimized agricultural production structure and irrigation methods as a function of soil characteristics* (expansion of orchards and vineyards on northeast upland sandy soils, use of precision irrigation scheduling and drip irrigation[22] for row crops and tree plantations, crop rotation and cultivation of crop residues and N-fixing and cover crops for soil winter cover, particularly on sloping ground).

(iii) On the area with higher slopes it is also necessary to apply *contour ploughing,* promote *conservation tillage* and maintain *cropland and riparian buffer strips* to prevent water and nitrogen surface runoff.

20 BMPs for N fertilizers and livestock manure utilisation.

21 With a 'real-time' nitrogen-sensor it is possible to apply fertilizer precisely and automatically at different rates in a field according to the natural variation of nutrients that are already in the soil (CEMA, 2013).

22 Proper irrigation scheduling, coupled with efficient irrigation systems is an important BMP for improving water use efficiency (WUE) and reduce nitrate leaching (Bauder et al., 2017; Perea et al., 2017; Popović, Ugrenović, 2015).

The EU Nitrate Directive has introduced the obligations of identifying polluted waters or waters at risk of pollution, designating land areas which drain into these waters (nitrate vulnerable zones − NVZs) and establishing the Code of Good Agricultural Practice (GAP) to be implemented by farmers on a voluntary basis and an action programme of mandatory measures for farmers within NVZs. Well-tailored, site-specific nitrogen BMPs based on the LOS analysis can significantly improve the quality of ND action programmes.

Policy and incentives

Development of criteria for NVZ designation and identification of agricultural land with significant contribution to N pollution, delineation of these zones and a catalogization of best agricultural practices to control nitrate pollution were the topics of the ENVAP II project, realized during 2014-2016 by the Ministry of Agriculture and Environmental Protection of the Republic of Serbia within the framework of cooperation with the Swedish Environmental Protection Agency. Main results of the project were the proposals of criteria for NVZs designation, NVZ designation and delineation and the Code of Good Agricultural Practice[23]. These proposals are the subjects of revision within IPA 2013 project "Further implementation of the National Environmental Approximation Strategy", within which the Specific Implementation Plan for the Nitrates Directive will be developed (The Government of the Republic of Serbia, 2018).

Establishment of the legal basis for determination of NVZ designation criteria, NVZ designation and delineation, adoption of action programmes of mandatory measures to protect NVZs, adoption of the Code of Good Agricultural Practice and determination of monitoring programme for evaluating the results of action programmes and review the document on determining the vulnerable zones, was carried out by the Law on Amendments to the Law on Waters (OG RS, 101/2016).

National Programme for the Adoption of the Acquis – NPAA (Third Revision, 2018) stipulates for the period 2018-2021: development of Specific Implementation Plan for the Nitrates Directive, designation of NVZs and adoption of the Code of GAP by the end of 2019 and development of Action Programs for implementation of measures to protect NVZs by the end of 2021 (two years after NVZ designation). Inclusion of agricultural advisory services at the local level in the process of farmer training for implementation of the GAP (and later also measures established by action programs) in NVZ is planned for 2019 (The Government of the Republic of Serbia, 2018).

Implementation of the EU Nitrate Directive requires considerable investments[24], including IPARD funds. Some investments for reduction of nitrogen (and phosphorus) flows into waters were realized in Serbia within the World Bank-led GEF *Danube River Enterprise Pollution Reduction – DREPR* project (2005-2011). The cost of the project

23 According to this project proposal, NVZs would cover approximately 49% of the territory of Serbia (Belgrade Chamber of Commerce, 2016).

24 Capital investments for reducing water pollution from agriculture are estimated at € 0.9 billion (OG RS, 80/2011).

was US$ 20.73 million, of which US$ 18.16 million was spent on nutrient reduction investments[25] (The World Bank, 2012).

IPARD II (2014-2020) financial support is available within the *Republic of Serbia IPARD Programme for 2014-2020* to large and medium-sized livestock farms for investments in storage facilities and equipment for manure management and to medium-sized field crop farms to purchase machinery for soil fertilization, while state financial support schemes for the mentioned purposes are reserved for small farms in these sectors (MAEP, 2014b).

Conclusion

Extensive use of nitrogen fertilizers and livestock manure in crop production and improper livestock manure management can severely deteriorate water quality and ecosystem performances. Effective nitrogen management can optimize crop yields and increase profitability while minimizing nitrogen losses. Knowledge of nitrogen flows is essential for designing management guidelines to minimize surface and groundwater pollution. LOS indices, i.e. vulnerability maps based on these indices, developed to classify the intrinsic vulnerability of the topsoil to water and nitrogen losses via percolation and runoff and applied in the City of Pančevo case study, pointed to the northeast part of the City of Pančevo territory as the most vulnerable to water and nitrogen losses. This is very important information that allows optimal selection of nitrogen BMPs adjusted to local climate, topography and soil properties. The identification of agricultural lands with significant contribution to N pollution, delineation of these zones and a catalogization of best agricultural practices to control nitrate pollution are the main tasks within the EU Nitrate directive transposition, which is ongoing in the Republic of Serbia and the research presented above can contribute to these efforts.

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Conflict of interests

The authors declare no conflict of interest.

25 Storage facilities and equipment for manure management were financed in 105 farms. The annual reduction in nitrogen pollution flows from these farms is estimated to be 44%.

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EXAMINATION OF REGIONAL DISPARITY IN THE LEVEL OF TOURIST OFFER IN RURAL CLUSTERS OF SERBIA

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ABSTRACT

Serbia is a country known for turbulent historical events, which completely disrupted the economic and political state of the country, and which had negative effects on the country's tourist development. In this research, the authors pointed to the current state of the level of services provided in rural parts of Serbia, and on the basis of the obtained data, found that there are disparities in the examined clusters when it comes to the level and quality of the services provided. So far, only a small number of authors have pointed to this issue, however, this research discusses a key problem that has negative implications for the development of rural tourism in Serbia. By including results in further research related to rural tourism, it is possible to develop long-term plans for removing regional disparities in rural clusters in Serbia.

Introduction

A large number of researches in the world deals with the development of rural tourism and the quality of services provided, which is often a limiting factor of development. Vujko (2017) points out in her research that rural tourism, both in developed and underdeveloped

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countries, often serves to stimulate regional economic activity. Gajic (2017) proposes that rural areas are perceived for tourists as places of safety, surrounded by open spaces and natural beauty places where everyone is treated with respect and kindness. In the last years of the 20th century, Serbia suffered a very difficult economic and political situation, so even tourism did not take a favorable position on the market. The regional constellation of Serbia is characterized by numerous diversity and a very heterogeneous degree of economic tourism development of rural areas. Rural tourism has been destroyed due to turbulent history, but also failures in rural development support policy, although there are conditions for its intensive development: valuable natural and cultural heritage (relatively preserved in original form), agricultural land, forests and water with rich ecosystems and biodiversity, including significant human resources and economic activities, as well as significant natural, cultural and historical heritage. The revitalization and implementation of rural tourism development is very complex and demanding, especially in the conditions of enormous heterogeneity in the physically small space, as well as economic backwardness of rural areas and the country as a whole. Rural areas of Serbia differ greatly in economic and social terms. This is due to geomorphological, demographic differences, then the difference in economic structures, infrastructure, environmental conditions, transport accessibility. In this paper, the authors presented information on the level of services provided in the regional rural clusters of Serbia, and the aim was to point to the existing regional disparities. Appropriate hypotheses were set up, starting with the research. The authors studied a total of 15 municipalities belonging to clusters: Vojvodina, Southeastern Serbia and Southwestern Serbia. The results achieved with the help of various data analysis analyzes undoubtedly point to the existence of regional imbalances in the level of services provided in rural tourism.

Theoretical framework

Rural tourism

Definitions of rural tourism are similar to most theorists, and the differences are made on the basis of the comprehensiveness of the resources listed in them. The term Rural tourism is often associated with historical heritage, authenticity and rusticity, whose development depends on natural environment, arts, heritage and tradition of agrarian societies. Furthermore, it is considered that the development of this form of tourism contributes to economic development and profit making for local communities, as well as to bring great benefits to the tourists themselves, precisely because of the enrichment of knowledge by introducing other cultures, traditions, history and society with the local population (Aref et al, 2009; Khound, 2013). Smith and Eadington (1992) share a similar view that rural tourism is a way to achieve mutual benefit, both for the local population and for tourists, who will enjoy it in natural, social values, which only results in positive effects. Lanea (1994) considers that the concept of rural tourism varies depending on the countries in which it is developing and defined. According to the same authors, rural tourism is identical with the term agrotourism, where the main tourist product is based exclusively on agricultural production and accommodation in traditional farm buildings.

In addition to the above comparison, authors use the terms green tourism, ecotourism and wilderness or forest tourism, which include different tourism products and services in rural areas. From an economic point of view, rural tourism is seen as an economic sector that opens new jobs for the local population, a higher standard, and the revitalization of rural areas (Svoradova et al, 2013). The development of rural tourism certainly contributes to the following economic categories: GDP growth, unemployment reduction, creating workplaces that do not require special education, stimulate family business, return young people to the village, develop small business - accommodation, catering, trade, entertainment, increasing local residents and state revenues, foreign investment attraction, promotion of the development and variety in other sectors (local crafts, manufacturing and agriculture), infrastructure development (Tosun, 2002). Apart from the economic effects, there are other non-economic effects, but they are no less important for local communities: promotion of cultural heritage and cultural exchange, discovery of new different cultural activities, promotion of social integration, community involvement, conservation and promotion of indigenous cultural values, promotion of local citizens' entrepreneurship, protection of natural areas, improving infrastructure, protection of the landscape.

Meaning of quality service (level of provided services) as a factor of success

The quality of services in tourism is viewed from the perspective of consumers, or his expectations. By ensuring the continuous and complete quality of the service, the preconditions for achieving customer satisfaction (user services) are set, and in that sense, providing the desired quality for consumers and their satisfaction, they achieve numerous competitive advantages. The concept of quality in tourism enables us to achieve the long-term goals of the company, as well as the satisfaction of the consumers through the delivered value. Many theorists adhere to the fact that success in the tourism market is achieved by adhering to all the principles of achieving quality service and creating loyal consumers (Said et al, 2013). Regarding the development of rural tourism, the development of quality services as a way of attracting consumers (Nair, 2006) is of great importance, and in terms of destinations, it is sure that quality attainment is essential for the success and preservation of the position on the tourist market. Furthermore, it is the customer who decides on whether a service is of quality or not.

Hence, tourists' evaluation of service quality is of prime importance (Lopez- Toro et al, 2010). Achieved quality of the influence affects the tourists themselves, as consumers and their choice of destination, as well as the wish for a return (Huh et al, 2006), and to make recommendations as the best way to promote and attract new consumers (Ozdemir et al, 2012). In recent decades, the construct of service quality and tourist satisfaction continue to receive a lot of research attention in the field of tourism (Narayan et al, 2009). Research is increasingly based on the promotion and achievement of quality services in rural tourism, providing a loyal consumer, and therefore a successful business in the tourism industry and the fight against competition (Knutson et al, 2007; Chen et al, 2011). Quality service becomes a strong link between consumers and service providers,

but can be achieved only if the customer needs are known in detail. According to Badler (2004), quality service is an important segment of successful business, but it must be recognized on the market and provide survival in the future.

Quality and related services are standard requirements of today's customers, which in the future will be the decision factor for customers. He struggles with competition can only be carried out with a better quality service, and all requests of consumers will be satisfied above the expectations (Oprean et al, 2011; Jose et al, 2015). In past years, customer experience has been a key concept in service research and management, including fields such as services marketing, innovation and retailing (Jakkola et al, 2015). Olsson (2012) also based his research on achieving quality service in tourism development, which affects the loyalty of tourists. The main weapon in the fight against competition is a quality service (Baloglu et al, 2003; Augustyn et al, 2004; Klaus et al, 2013). However, some of the theoreticians argue that a large number of research based on consumer experience is conceptual and descriptive (Chang et al, 2010; Helkkula, 2011) and does not reflect the causal state and impact of experience quality and marketing outcomes (Palmer, 2010; Lemke et al, 2011).

The state of rural development in the EU and Serbia

In the EU, rural areas cover over 90% of the territory, with approximately 57% of the population (average population density of 125 inhabitants per square kilometer in rural areas, 614 in urban areas. In remote or sparsely populated areas (north of Finland), the density is 2 inhabitants/km. Portugal, Spain, Italy, Greece, Finland are countries where high income levels in rural areas are not being achieved and they have a high unemployment rate. Romania and Bulgaria have a total of 7.5 million households with less than 5 ha of land, and most cannot earn enough income for their farm households (EC 2004), and are forced to seek work or supplementary income in other parts of the rural economy. Privatization of agricultural land in some countries has led to the disappearance of cooperatives, while in other cooperatives and commercial farms they are in a large percentage of arable land: Slovakia (76%), Bulgaria (74%), Czech Republic (72%) and Hungary (50%). Individual farms cover most of the cultivated land in Slovenia (94%), Latvia (90%) and Poland (86%). According to the Pan-European Association of Rural Tourism, there are about 200,000 well-known registered service providers in rural tourism in Europe, with more than two million beds (2008). It is estimated that accommodation in various facilities in rural areas has a direct annual tourism spending of around 12 billion euros. In Serbia, about 85% of the total territory is classified as rural, with 55% of the population living in it, accounting for 41% of the country's GDP. The rural part of Serbia has about 3900 settlements. In rural areas of Serbia there are 1.365.000 households, which makes up 54% of the total number of households in Serbia. From 1991 to 2002, the number of people in rural areas in Serbia decreased by 3,6% in relation to the total decline in the population in the country by 1%, while in the period from 2002 to 2011 the number of inhabitants decreased by 311,139 (10, 9%).

In the 1920s, the agrarian exodus followed the process of modernization of agriculture and the trend of urbanization and the victims of local wars, rural Serbia lost a large percentage of the population, especially the young. Unemployment rate in rural areas reaches 21%, while GDP per capita is only 74% of the national average. Households of up to 3 ha have about 328,000 and make up about 56% of all households in rural areas. Over 600,000 farms have less than 5 ha of land. The average size of the family farm in Serbia is about 3.7 ha. Private ownership is the dominant form in the ownership structure of 5.4 million hectares of the total agricultural land of Serbia. Of the total arable land, 83.7% are in private hands. The agricultural population includes over 60 years of age with a lower level of education and a large percentage of dependents over 15 years of age. Unemployment in rural areas reaches as much as 21%. Despite the exodus from rural areas, in Serbia the share of agriculture in employment remained among the highest in Europe, with 33% of employees in the primary sector, while 75-80% of active working population in rural areas is included in agriculture. In the structure of rural employment, almost 59% of rural population in the working age between 15 and 64 have secondary education (three years). In the structure of the rural population older than 15 years, the majority of 39.2% have a secondary school, 28% completed only elementary school, and 29% are not literate and do not have any formal education. Only 4% of the rural population aged 15 and over completed the faculty. So far, rural tourism is supported by more than 32,000 registered and unregistered beds in rural areas, of which only 10,000 are in rural settlements. Rural tourism, at the moment, directly participates in the Serbian economy with 10.4 billion RSD (Serbian currency). This represents 16% of the total GDP in the travel and tourism sector in the Republic of Serbia in 2016. The average daily consumption recorded is lower than in other countries and amounts to 1900 RSD per person (15 euros), excluding the costs of accommodation and transportation. It is estimated that in 2016 rural tourism realized 2.7 million nights or 27% of the total number of tourist nights in the Republic of Serbia. The average occupancy rate of a hotel in a rural accommodation is 4%, and the other accommodation capacities are 21%. (Master Plan of Sustainable Development of Rural Tourism in Serbia, 2015).

Research methodology

According to the Master Plan of Sustainable Development of Rural Tourism in Serbia from 2010, 12 clusters of rural tourism (KRT) were defined: 1. KRTG 1: Central Serbia and Western Serbia - KRT1: Golija; KRT2: Zlatar and Zlatibor; KRT3: Kopaonik; KRT 4: Central Serbia; 2. KRTG 2: South Banat and Donje Podunavlje - KRT5: Lower Danube Region; KRT6: South Banat; 3. KRTG 3: Eastern Serbia - KRT7: Sokobanja; KRT 8: Eastern Serbia; KRT9: Southeast; 4. KRTG 4: Vojvodina - KRT10: Fruska Gora; KRT11: Upper Danube Region; KRT12: North. The authors of the paper carried out a survey in Serbia in the rural areas of Vojvodina, Southeastern and Southwestern Serbia, from May to December 2016 in the municipalities of Subotica, Sombor, Novi Sad, Irig, Kovin, Valjevo, Kosjerić, Gornji Milanovac, Knić, Čajetina, Majdanpek, Negotin, Knjaževac, Pirot and Dimitrovgrad (Master Plan of Sustainable Development of Rural Tourism in Serbia).

Table 1. Hypotheses development

Objectives of research	Hypotheses (sub-hypotheses)
Objective 1 – Existed level of offered tourist services in rural clusters of Serbia	**H1** - The satisfaction of tourists, with the content and existing level of the tourist offer of rural households in Serbia, are statistically significantly different from the offered quality of service
Objective 2- regional disparity	**H2** - The attitudes of tourists on the quality of services are statistically significantly different from the observed regions. **H2a** - There is a statistically significant difference in the quality of services for the segment of importance across regions. **H2b**- There is a statistically significant difference in service quality for the satisfaction segment. **H2c**- The economically weakest region offers the weakest quality of service.

Methodology procedure and sampling

A survey taken from the research carried out by Albacete-Saez, Fuentes-Fuentes and Llorens-Montes (2007) and the scale tested in rural areas in Spain was used to explore tourist attitudes. Data processing collected during the survey was performed in the SPSS program version 19.0. The research involved 15 rural locations, and a total of 164 respondents. The research involved 42.7% of men and 57.3% of women, the age in most cases ranging from 21 to 60 years (94.5%). The highest percentage of respondents are students (42.1%) and those engaged in tourism (26.2%). The survey participants are mostly with a completed secondary school (53%) and with monthly income of 200 to 600 euros (50.6%). When the regional structure of the respondents in question data are as follows: Vojvodina 40.5%, Southwestern Serbia 31.3%, Southeastern Serbia 28.2%.

Table 2. Sample profiles (N=164; 100%)

Category	Frequency	Percent (%)
Male	70	42.7%
Female	94	57.3%
Age		
≤ 20	3	1.8%
21-60	155	94.5%
61 ≥	6	3.7%
Occupation		
Agriculture	5	3.0%
Tourism	43	26.2%
Craft	10	6.1%
Student	69	42.1%
Other	37	22.6%
Education		
Elementary school	--	--
Secondary school	87	53.0%

College	41	25.0%
BSc	36	21.95%
Monthly income		
≤ 200	53	32.2%
201-600	83	50.6%
601-1000	23	14.0%
1001-2000	3	1.82%
2000 ≥	2	1.21%
Region		
Vojvodina	66	40.5%
Southwestern Serbia	51	31.3%
Southeastern Serbia	47	28.2%

Source: the authors created based on research

Results and discussion

According to descriptive indicators, it is noted that the variables "Personal responsibility" are rated by the highest marks from the aspect of importance and aspect of satisfaction from tourists visiting the rural areas of Serbia (the arithmetic meanings are 31.33 and 29.94 respectively). The second and third items of importance are "Material elements" and "Relations with tourists", while these are the reverse order by pleasure. The lowest score was recorded by "Safety" on both scales.

Table 3. Descriptive indicators for the highlights on aspects of the existing level of tourist offer

		M	SD	Me	Q	Min	Max	s	K	N
Importance	Personal responsibility	31.33	3.45	32	6	21.00	35.00	-0.79	-0.16	164
	Supporting offer	16.74	2.61	17	3.97	8.00	20.00	-0.99	0.89	164
	Relations with tourists	25.53	3.56	26	4.75	13.00	30.00	-0.98	0.90	164
	Basic requirements	21.81	2.82	22	4	12.00	25.31	-0.81	0.15	164
	Material elements	25.59	3.05	26	4	17.00	30.30	-0.78	0.03	164
	Security	15.90	3.14	16	4.75	6.00	20.00	-0.69	0.03	164
	Empathy	16.79	2.90	17	4	6.00	20.00	-1.04	0.89	164
Satisfaction	Personal responsibility	29.94	4.33	30.5	6	17.00	35.00	-0.78	-0.04	164
	Supporting offer	16.38	2.78	17	5	9.00	20.00	-0.55	-0.50	164
	Relations with tourists	24.98	3.43	25.5	5	16.00	30.22	-0.53	-0.36	164
	Basic requirements	20.11	3.74	20	5	9.00	25.65	-0.56	-0.33	164
	Material elements	24.17	3.46	25	5	14.00	30.29	-0.61	-0.09	164
	Security	14.25	3.34	14	5	4.00	20.00	-0.26	-0.39	164
	Empathy	15.51	3.02	16	5	7.00	20.00	-0.34	-0.64	164

Source: Created by the author based on data analysis.

Statistical results show that tourists visiting the rural tourism regions of Serbia are mostly dissatisfied with furniture, space and price of accommodation. Since the possibility of investing in a better tourist offer in Serbia is very limited due to the crisis situation in the country, such a reaction of tourists is expected. Owners of rural households in rural tourism facilities in Serbia are unable to provide higher quality of

services provided, and this is one of the reasons for underdevelopment of rural tourism in the investigated areas of Serbia. This confirms the hypothesis H1 (+), about the poor level of given services.

A Kruskal-Valis test was applied to compare the ratings of tourists visiting different regions.

Table 4. Results of the Kruskal-Valis test to compare the attitudes of tourists who visited different regions

	Importance			Satisfaction		
	χ2	df	p	χ2	df	p
The host fulfills every request in a correct and timely manner.	5.803	2	0.055	7.094	2	0.029*
The host knows his job, he is good at him and does it without error.	3.147	2	0.207	10.586	2	0.005**
The host addresses the guests to solve the problem.	3.104	2	0.212	4.179	2	0.124
The host always deals with guest requirements.	6.368	2	0.041*	11.22	2	0.004**
When a problem arises, the host quickly approaches his resolution.	7.132	2	0.028*	5.106	2	0.078
The host meets the requirements without delay.	5.203	2	0.074	8.285	2	0.016*
There is always someone in the household who is ready to take care of our demands.	0.675	2	0.714	8.573	2	0.014*
The host provides us with quality meals.	2.347	2	0.309	2.288	2	0.319
The host has the role of a tourist guide and provides us with information about the services that are available to us.	0.748	2	0.688	1.571	2	0.456
The host provides us with homemade and traditionally prepared meals.	0.609	2	0.738	3.093	2	0.213
In the household, there is the possibility of including guests in domestic activities (collecting fruits, watching domestic animals, participating in the preparation of brandy, wine, home-made food)	0.119	2	0.942	2.719	2	0.257
Household members know the tradition, customs and history of their place.	1.289	2	0.525	9.951	2	0.007**
Household members are engaged in activities that make our stay more complete (making souvenirs from natural materials, weaving workshops or connections).	2.544	2	0.28	6.659	2	0.036*
Household members give us good advice and suggestions about activities that make our stay more complete.	1.053	2	0.591	5.665	2	0.059
Household members provide us with interesting information about the foods of the site.	6.032	2	0.049*	9.571	2	0.008**
Household members come to us with kindness and warmth.	6.737	2	0.034*	2.531	2	0.282
Household members are friendly to us.	1.625	2	0.444	5.034	2	0.081

	Importance			Satisfaction		
	χ2	df	p	χ2	df	p
Household furniture and furnishings are well preserved.	2.403	2	0.301	10.45	2	0.005**
The room we are in (rooms) is comfortable.	1.944	2	0.378	7.139	2	0.028*
Common rooms in the household (corridors, kitchen, dining room, lobby) are well preserved.	2.553	2	0.279	7.027	2	0.030*
Marketing of households is credible.	1.004	2	0.605	6.925	2	0.031*
The price of accommodation is in accordance with quality.	2.676	2	0.262	7.595	2	0.022*
The interior of the household (furniture, light, floors, etc.) is pleasant, homely and authentic.	0.583	2	0.747	5.489	2	0.064
The exterior of the household (facade, garden, yard) is attractive and in keeping with the rural environment.	0.639	2	0.726	4.452	2	0.108
The host is dressed in a traditional costume.	2.338	2	0.311	4.375	2	0.112
Rooms in which we are accommodated are clean.	3.946	2	0.139	18.625	2	0**
The whole household is clean.	4.069	2	0.131	22.026	2	0**
Extra space (garden, garden, terrace, barbecue) is clean.	0.028	2	0.986	8.858	2	0.012*
In the household, security measures have been taken (eg money deposit boxes, etc.).	1.502	2	0.472	1.992	2	0.369
The hosts take care of the safety of guests.	0.583	2	0.747	1.309	2	0.52
Each part of the household is marked with an appropriate sign.	2.321	2	0.313	0.345	2	0.842
The access road to the household is marked with appropriate signs.	0.898	2	0.638	2.086	2	0.352
The hosts know a foreign language.	6.461	2	0.04*	8.143	2	0.017*
The hosts try to make sure that the guests understand them well.	4.073	2	0.13	3.647	2	0.161
The hosts take care of the guest taking into account his personal wishes and needs.	6.317	2	0.04*	5.709	2	0.058
If there is a group of guests, the host of the requirements of each of them is accessed individually.	4.984	2	0.083	3.73	2	0.155

Source: Created by the author based on data analysis in SPSS 19.0.
Note: * p <0.05; A ** that is p <0.01

Table 5. Comparison of respondents by regions (MWU test) - importance

	Vojvodina – SW Serbia			**Vojvodina – SE Serbia**			**SW Serbia – SE Serbia**		
	MWU	Z	p/3	MWU	Z	p/3	MWU	Z	p/3
The host always deals with guest requirements.	1590.5	-0.58	0.18	1205.5	-2.02	0.01*	884.5	-2.29	.007**
When a problem arises, the host quickly approaches his resolution.	1430.5	-1.64	0.03*	1327.5	-1.25	0.07	852	-2.65	.003**
Household members provide us with interesting information about the foods of the site.	1272	-2.39	.005**	1375.5	-0.88	0.12	977	-1.52	0.04*
Household members come to us with kindness and warmth.	1670.5	-0.11	0.30	1237	-2.22	0.01**	951	-2.12	0.01*
The hosts know a foreign language.	1519	-0.95	0.11	1103.5	-2.55	.004**	973.5	-1.48	0.04*
The hosts take care of the guest taking into account his personal wishes and needs.	1621.5	-0.39	0.23	1213	-2.01	0.01*	884.5	-2.33	.007**

Source: Created by the author based on data analysis in SPSS 19.0.
Note: * p <0.05; A ** that is p <0.01

According to the MWU significance test, there is a significant difference in the rating of the item "The host always deals with guest requirements". Tourists who visited Southeastern Serbia have lowered this quality indicator according to importance in relation to those from Vojvodina and Southwestern Serbia. According to this statistical result, we conclude that visitors to rural destinations of South East Serbia have lower expectations regarding tourism offer and its quality. This may be partly due to the worsening economic situation and the underdevelopment of this region of Serbia in terms of rural tourism. The highest rating for the item "When a problem arose, the host quickly approaches its resolution" was given by tourists who visited Southwestern Serbia, compared to those from Vojvodina and Southeastern Serbia. This indicator shows that the provider of services in the rural household is demanding and entrepreneurial, and that the biggest expectations for this are due to tourists from Southwestern Serbia. Once again, the analysis leads to the conclusion that the expectations of tourists from this region of Serbia are high and that a high level of quality of the services provided in this area is required. In addition to the susceptibility of the host, there is a statistically significant difference in the expectations regarding the provision of information on traditional foods. The highest rating for the item "Household members provide us with interesting information about the food of a given place" was given by tourists

from Southwestern Serbia suggesting that they have the highest expectations regarding traditional food which is one of the main attractions of rural tourism.

A statistically significant difference was also found in the item "Household members are going to us with kindness and warmth". The least importance to this item was given by tourists who visited Southeastern Serbia. This is another proof of the low expectations of tourists as a result of poorly developed rural tourism in this region compared to the developed regions of Serbia, such as Vojvodina and Southwestern Serbia. In support of the previously concluded conclusion, the lowest ratings of tourists from South East Serbia that are given with the words "Hosts know a foreign language" and "Hosts take care of the guest, taking into account his personal wishes and needs" can be added. The existence of the difference is statistically significant, and can be attributed to the conclusion that the expectations of tourists from the South-East region are low, and that the rural tourism of this region does not develop in a positive direction.

Table 6. Comparison of respondents by regions (MWU test) - satisfaction

	Vojvodina – SW Serbia			**Vojvodina – SE Serbia**			**SW Serbia – SE Serbia**		
	MWU	Z	p/3	MWU	Z	p/3	MWU	Z	p/3
The host fulfills every request in a correct and timely manner.	1316	-2.26	.008**	1482	-0.23	0.272	873	-2.44	0.005**
The host knows his job, he is good at him and does it without error.	1539	-0.88	0.125	1124	-2.50	.004**	782	-3.04	.001**
The host always deals with guest requirements.	1316	-2.20	.009**	1305	-1.33	0.060	744.5	-3.32	.000**
The host meets the requirements without delay.	1369.5	-1.86	0.021*	1329.5	-1.18	0.078	805	-2.85	.001**
There is always someone in the household who is ready to take care of our demands.	1205	-2.85	.001**	1429.5	-0.56	0.191	909.5	-2.10	.012*
Household members know the tradition, customs and history of their place.	1413.5	-1.62	.035*	1258	-1.62	.035*	754	-3.24	.000**

	Vojvodina – SW Serbia			Vojvodina – SE Serbia			SW Serbia – SE Serbia		
	MWU	Z	p/3	MWU	Z	p/3	MWU	Z	p/3
Household members are engaged in activities that make our stay more complete (making souvenirs from natural materials, weaving workshops or connections ..).	1462.5	-1.25	0.070	1077.5	-2.71	.002**	1040	-0.99	0.107
Household members provide us with interesting information about the foods of the site.	1166.5	-3.03	.001**	1406	-0.69	0.162	896.5	-2.16	.010**
Household furniture and furnishings are well preserved.	1314	-2.15	.010**	1292.5	-1.41	0.052	766	-3.1	.001**
The room we are in (rooms) is comfortable.	1398	-1.69	.030*	1314.5	-1.27	0.067	837.5	-2.58	.003**
Marketing of households is credible.	1248	-2.47	.004**	1385.5	-0.81	0.139	922.5	-1.88	.020*
Common rooms in the household (corridors, kitchen, dining room, lobby ...) are well preserved.	1420	-1.56	.118	1299	-1.37	.170	837.5	-2.58	.010*
The price of accommodation is in accordance with quality.	1320	-2.13	.011*	1403	-0.71	0.158	835	-2.61	.003**
Rooms in which we are accommodated are clean.	1258.5	-2.80	.002**	1216.5	-1.95	.017*	659.5	-4.23	.000**
The whole household is clean.	1279	-2.57	.003**	1112	-2.60	0.003*	594	-4.58	.000**
Extra space (garden, garden, terrace, barbecue) is clean.	1517	-1.01	0.104	1198.5	-2.02	0.014*	792.5	-2.95	.001**
The hosts know a foreign language.	1458	-1.27	0.068	1220.5	-1.82	0.023*	795	-2.79	.002**

Source: Created by the author based on data analysis in SPSS 19.0.
Note: * p <0.05; A ** that is p <0.01

According to the results of this test and the confirmed statistical significance, it was determined that tourists who visited the rural areas of Southwestern Serbia give the highest grade "The host fulfills every request in a correct and timely manner". Compared with Vojvodina and Southeastern Serbia, we conclude that the highest level of satisfaction was shown by tourists from the south-western part of Serbia, which points to the highest level of quality of tourist services that visitors of rural areas met. The fact is that the southwestern part of Serbia is more developed in terms of rural tourism. However, when assessing the degree of development of this economic activity, the political and economic situation in the country, which is the biggest obstacle to development, must be taken into account. In support of the previous conclusion, the statistical significance of the difference in the assessment of the quality of the host service and the fulfillment of the requirements of the hosts is added, according to the paragraphs "The host knows his job, is good in it and performs it without mistake" and "The host always deals with guest requests". Tourists who visited Southeastern Serbia gave the lowest rating of the quality of the tourist services provided by the host, while the respondents from Southwestern Serbia gave the highest rating to the satisfaction of the host's commitment and dedication to their guests. The high satisfaction of tourists from the south-western parts of Serbia was confirmed by the highest statistical significance for the items "The host is meeting the requirements without delay", "In the household there is always someone who is ready to take care of our demands" and "Household members know the tradition of customs and the history of their place". High satisfaction ratings are the result of a quality service that meets the expectations of tourists. It can be concluded that the Southwestern Serbian hosts are ready to meet the demands of their guests and thus achieve a higher quality of services they are able to provide. The lack of this behavior of the host is noticeable in less developed rural-tourist areas, such as Southeastern Serbia. The conclusion of the conducted analysis confirms that there is a greater dissatisfaction with the quality of the provided services of tourists from the South East municipalities of Serbia. This is confirmed by very low estimates for the following items: "Household members are engaged in activities that make our stay more complete (making souvenirs from natural materials, weaving workshops or connections)", "Additional space (yard, garden, terrace, grill) is clean" , "The hosts know a foreign language" and "Household members provide us with interesting information about the foods of the site".

As the most demanding group in our research, Southwestern Serbia tourists attach great importance to the quality of furniture and premises in the accommodation facility. They expressed great satisfaction with the comfort of accommodation in the rooms, the cleanliness of rooms, and the price they paid for the quality of service provided. Statistical significance was obtained for the following items: "Complete household is clean", "Rooms in which we are located clean", "Common rooms in the household (corridors, kitchen, dining room, lobby) are well preserved", "Price of accommodation Is in keeping with the quality, "" The room we are in (rooms) is comfortable ". Lower estimates for these items were given by tourists who visited rural municipalities of Vojvodina and Southeastern

Serbia, suggesting that the level of services provided by hosts of these areas to their guests is lower, and that the level of development of rural tourism in these areas compared with the Southwestern Serbia degraded. According to the statistically significant difference in the item "Marketing of households is authentic" of different groups of tourists in Serbia, it can be concluded that the households of Southwestern Serbia are mostly fulfilling the offer that attracted the attention of their guests.

Once again, it was confirmed that a high level of tourist satisfaction points to a better tourist offer of rural catering facilities of Southwestern Serbia in comparison with the offer of the owners of rural households from Vojvodina, and especially from Southeastern Serbia. On the basis of all the results of the survey, hypotheses of H2, as well as the hypothesis itself, were confirmed. It was found that there is a significant difference in the assessment of the segment's importance (H2a) and satisfaction (H2b) by regions, and it is also confirmed that the economically weakest cluster is also the least developed tourist (H2c). This fact is a confirmation of the hypothesis H2, that the regional disparity in the rural development of the development of Serbia is expressed).

Conclusion

What is primarily based on the topic of this paper is an insight into the existing interregional inequality regarding the quality of existing services in tourism of rural clusters of Serbia. The disparities in the territorial tourism development of Serbia drag the roots of the past, and are mainly conditioned by the polarization of the tourism economy. The basic theory of regional tourism development stems from the fact that development does not happen everywhere and at the same time. The once acquired advantage shows the tendency to sustain it permanently. The driving forces of tourism development trigger the cumulative development process away from other regions that are circumvented. But if it is true that regional development is a dialectical process in which polarization is inevitably and economically justified to a certain degree, then it is a matter of estimation whether the development of the whole tourism economy has reached the point where the effect of expansion is not only from social but also for economic reasons, it gets an edge. In that case, all the factors behind the lagging of tourism development would have to find a solution in a comprehensive regional policy, which would be in opposition to further polarization among the regions. Within such a policy, development goals should be highlighted, which are in fact deeply rooted in tourism and economy and are very simply formulated. They predict that in the process of tourism development all regions are rapidly evolving, and that the differences between each other are gradually reduced, that is, in the outcome, completely disappearing. The authors of the paper tried to point out that the level of services provided to tourists in rural clusters in Serbia is at an unsatisfactory level, and that there are significant unevenness in the quality of services in the investigated areas.

After processing the data, it was confirmed that H1 and H2 Hypotheses were confirmed, as well as subhipheses that the items of satisfaction and importance are quite different in clusters, and that the (H2c) economically developed area is also the weakest in terms

of providing quality services. Regional disproportions are the result of natural and historical conditions of development, the degree of utilization of natural resources, the structure of the economy, the allocation and development of productive forces. Significant differences in the level of quality of services rendered in rural tourism are not only socially unacceptable but become a brake on general development, so increasing attention is focused on achieving more coherent regional development, as conditions for the optimal development of not only individual areas, but Serbia as a whole. Although the goals in some way indicate that under equal development, the level of development and at all costs should not be understood as an average state, it does not foresee the time when these differences could be reduced and, in particular, disappear. There is no vision of the time in which equalization of tourism development should occur in the regions, but the question is how to influence the reduction of large differences in the development of the tourism economy in the regions of Serbia.

Conflict of interests

The authors declare no conflict of interest.

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PRODUCTION OF ŠAR CHEESE - DEVELOPMENT OPPORTUNITY FOR ŠTRPCE MUNICIPALITY

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A B S T R A C T

As a result of the climate in which it is produced, as well as its recognizable taste and quality, the Šar cheese is a high demand product on the market of Kosovo and Metohija. The authors will, based on the research presented in this paper, give an overview of the production and the main carriers of the Šar cheese production. It will also present how Šar cheese production may be used in helping people survive in Sirinićka Župa. This paper would also, through direct surveys, observe perceptions and attitudes of the inhabitants of this region and provide practical guidelines on the production of the Šar cheese as development potential of the municipality of Štrpce, and recommend further agricultural reforms and tourist capacities of this region.

Introduction

Cheese production is almost as old as the civilization itself. According to the historical data, the production of this dairy product started in 8000 BC, while, thanks to the development of the civilization of the ancient Greece, it was raised to a higher level and has become a true art. The beginning of the industrial cheese production dates back to the beginning of the 19th century and Switzerland, but the real industrialization in production and purchase began in America in 1851. Nowadays, cheese is one of the main dairy products that is widely used in everyday consumption. It is produced in about 1.000 different variations, mostly in the United States, Europe, Australia and New Zealand (*Table 1*). The document World Cheese Market 2000-2020, prepared by PM Food & Diary Consulting (2014), stated that the market share of the European Union and the United States was 70% of the global cheese production in 2012, and it is expected that the cheese production will have further dynamic growth by 2020, when it will reach the amount of 16.6 million tons (MT).

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Table 1. World cheese market 2000-2020

100 MT	2000	2012	2012/2020	2020 (prognosis)	2020/2012
EU-28	7,709	9,333	+21%	10,606	+14%
the rest of Europe	266	291	+9%	338	+16%
CIS	448	866	+93%	1,072	+24%
North America	4,227	5,618	+22%	6,720	+20%
Oceania	665	700	+5%	930	+33%
South America	1,118	1,625	+45%	2,067	+27%
Asia	293	456	+55%	1,288	+187%
Middle East + Africa	744	1,512	+103%	2,054	+36%
Total world	15,470	20,401	+32%	25,075	+23%

Source: PM Food & Diary Consulting, 2014

When talking about Europe, the leading countries in cheese production are Germany, France, Italy and the Netherlands. There are many types of cheese produced in Europe, including: Appenzeller, Cheddar, Edam, Emmentaler, feta, fontina, Gouda, Gorgonzola, Grana Padano, Gruyere, halloumi, kashkaval, Camembert, mascarpone, manchego, mozzarella, Olomouc, Parmesan, Pag cheese, Pecorino, ricotta, Romadur, Tilsit, Trappist. Perhaps less widely known, but certainly not with less quality, are cheeses from the Republic of Serbia. On account of geographic, climatic and vegetation diversity, the production of autochthonous cheese has been developed in Serbia (Mladenović K., et al., 2017). There are several autochthonous types of cheese originated from this area, and their names indicate the place of their origin: Pirot, Sombor, Kraljevo, Homolj, Sjenica, Zlatar, Pljevlja, Mileševa, Šar cheese, etc. When it comes to cheese production, Serbia is not far behind developed countries of the European Union. According to Eurostat Milk and Milk Product Statistics (2017), Serbia is ranked 13th, ahead of some developed European countries such as the Czech Republic, Belgium, Sweden and Finland, but also some countries in the region: Bulgaria, Hungary, Croatia and Romania.

Cheese production is spread all over Kosovo and Metohija and it presents an important part of the traditional food (Butuqi et al., 2017). According to the data of the Ministry of Agriculture, Forestry and Rural Development of the Provisional Self-Government in Priština from 2015, 14.289 households are involved in the cheese production. The total cheese production in that year was 17 900 tons, which required around 107 900 tons of milk. One of the most famous type of cheese in this area is the Šar cheese, which is produced in households in the villages of the municipality of Štrpce. In the area of this municipality, which is characterized by exceptionally preserved environment, clear rivers and streams, as well as clean mountain air, the cheese is produced in the traditional way that has been used since the ancient times. They are preserving the inherited tradition of our ancestors. Considering that "good reputation goes far…", the taste of this dairy delicacy is widely known and attracts more fans every day. Its popularity is also indicated by the fact that buyers pre-order cheese, because the production has been lower than the market needs for a long time.

Due to the small number of researches done on the topic of the cheese production and generally about the municipality of Štrpce, especially after 1999, the intention of the authors is to correct that by promoting the municipality of Štrpce, especially the Šar cheese as the top positioned local specialty. An analysis made on the basis of the conducted research will provide an overview of the production state and sales of cheese in the municipality of Štrpce. The aim of this research is to illustrate how the livestock fund, technology and the involvement of household members influence the production of cheese, and whether the support towards the establishments of new small farms would improve production of Šar cheese and economic environment of the Municipality of Štrpce. Additionally, the paper would determine the potential for expanding the agricultural and tourism capacity of the region, and how the advancement of cheese production would contribute to improving the living standards and quality of living of the inhabitants of this region, as well as the perspectives for durable existence in economic terms. Also, the paper will give suggestions what measures the municipality of Štrpce and its farmers could take in order to follow the examples of successful countries, when it comes to cheese production.

The production of agricultural products has always been at the top of economic activities in the Republic of Serbia. Agricultural and food sector has a very important role in the economic development of the Republic of Serbia, considering its significant participation in domestic export (Đurić et al., 2017). Milk production is one of the essential sectors of Serbian agriculture, and therefore the survival of the whole production system is in the public interest (Zekić et al., 2016). Although according to Eurostat (Milk and Milk Products Statistics, 2017), the production is generally lower in Serbia than in more developed countries of the European Union (according to milk production, Serbia is ranked 31st place), there are tendencies of its growth. Growth is also expected in the consumption, especially of the healthy food, that is 100% organic products, but also those with low fat content or nonfat products. The situation in the Kosovo area is similar. The market of milk and dairy products in Kosovo and Metohija is one of the fastest growing in the entire agricultural field. Although import is largely responsible for the enrichment of the dairy products market, there are still products produced only in this region, which make up an important part of the offer on the Kosovo and Metohija market. Among these products, one of the most famous is the Šar cheese.

Cheese is one of the oldest food products with preservation based on fermentation, the most common and perhaps the oldest biotechnology (Bulajić et al., 2017). Mladenović K., et al. (2017) wrote that southeastern region of Serbia is one of the areas known for the traditional method of producing dairy products. In this region, the inhabitants produce one type of cheese made from unpasteurized cow's milk. Šar cheese is a hard cheese, produced in settlements below the Šar Mountains such as Štrpce, Opolje and Gora. The tradition of producing this delicacy is over a hundred years old and is passed from generation to generation.

Table 2. Livestock breeding by districts

Livestock type	Priština district	Peć district	Prizren district
Pigs	10.934	9.068	4.204
Horses	6.230	2.293	7.525
Mules	53	150	644
Donkeys	2.362	1.520	4.265
Cows and bulls	50.600	20.774	20.010
Calves	15.700	20.215	5.490
Oxen	39.000	9.960	13.585
Buffalo	3.930	2.070	3.550
Sheep	149.640	62.297	15.031
Goats	100.720	16.929	52.735

Source: Mikić, 1988

The beginnings of livestock breeding in this area date back to the distant past. In the first half of the 19th century, livestock breeding was the most developed in the settlements on the Šar Mountain (Mikić, 1988). According to the book "Social and Economic Conditions of the Kosovo Serbs in the Nineteenth and Early Twentieth Centuries", as well as Petar Kostić, at that time the livestock units were counted in millions (*Table 2*).

The main livestock breeders in the northeastern part of the Šar Mountain, or as Mikić called them "Baš-Šari", were Serbs from Sirinićka Župa, Sredska and Macedonia. The situation remained like this until the end of the 18th and the beginning of the 19th century, when this area of the Šar Mountain was inhabited by Albanians, who took over the leading position from Serbs. However, due to the circumstances that prevailed at that time (robberies, temporary work abroad, the emergence of new occupations such as tailors, blacksmiths and other crafts), the interest in livestock breeding declined. However, there are still households which livestock graze on the slopes of the Šar Mountain and which continue with the tradition of making cheese and other dairy products. All this, as well as the special type of cheese was mentioned in the famous "Constantinople Gazette". Despite the decrease of livestock breeding in the Šar Mountain, Constantinople Gazette from June 28, 1901 wrote that "Šar cheese conquered neighboring markets. This cheese is characterized by a yellow greasy color and a taste that no other cheese has, regardless of their production" (Mikić, 1988). This description can still be used for the cheese produced in the municipality of Štrpce.

In the beginning, Šar cheese was most commonly made from sheep's milk, and there were a few reasons for that: there were plenty of sheep, and they often went to graze in higher and more inaccessible parts of the mountain. They grazed autochthonous grass and medicinal herbs that gave milk and cheese a special flavor. With the increasing of the number of cows, cheese begins to be made from cow's milk as well.

The recipe for preparing this specialty of Sirinićka Župa has remained the same as it was a hundred years ago. This traditional, but also ecological method, implies manual cow or sheep milking, after which the fresh milk is strained and heated at a temperature of 30 to 40° C. In order to make 1 kilogram of cheese, about 10 liters of cow or 7-8 liters of sheep's milk

is needed. The next step is pouring the rennet into the heated milk. These products are used for the purpose of separating the fatty part of milk and whey. After the milk is left for a while with the occasional mixing, it is poured into a larger container with a gauze and strained. The cheese made this way is compressed in the gauze and compressed firmly in order to release all the liquid out and then it is left for a while. It is made in the form of round, flat balls, which are then dried in a dark place with good air flow. The most usual place for that is a terrace, attic or a specific chamber placed at the air flow points. The drying time is usually ten to twenty days and may be longer or shorter, depending on the season. After drying, a liquid for salting the cheese is being prepared. It is a mixture of water and salt (usually about 300-400 grams of coarse, sea salt should be dissolved in a liter of water) in which already dried and cut down cheese is put and left for ten days. After that the cheese is ready for sale.

The quality of such cheese is very high, since it is a hard, full-fat dairy product. As Mladenović K., et al. (2017) said, cheese is an excellent source of protein, fat, minerals (calcium, iron, phosphorous), vitamins and amino acids. Some of the nutritive values of different types of cheese are listed in *Table 3*. It can be seen in the table that high-fat hard cheese, such as Šar cheese, has a very high calorie value, protein and fat values, but no carbohydrates. According to these indicators, they can be compared with more famous types of cheese such as: Emmentaler, Gorgonzola, Gouda and Parmesan.

Table 3. Nutritional value of different type of cheese per 100gr

Cheese type	Calories	Proteins	Carbohydrates	Fat
Soft cheese	73	14	4	1
Half-timed soft cheese	103	12	3	4
Fat hard cheese	347	20	0	30
Low-fat cheese	78	12	3	2
Melted cheese (45% fat)	386	14	6	24
Hard cheese (45% fat)	372	25	3	28
Fresh cow cheese	72	15	4	3
Emmentaler	383	30	0	30
Gorgonzola	360	20	0	30
Gouda	367	27	0	30
Resinous cheese	140	32	0	1
Melting cheese	272	16	0	24
Parmesan	367	34	0	34
Mozzarella	227	20	0	17
Cheese from skim milk	234	18	1	19

Source: http://www.vjezbaj.com/kalorijska-tablica/, (June 06, 2018)

Materials and methods

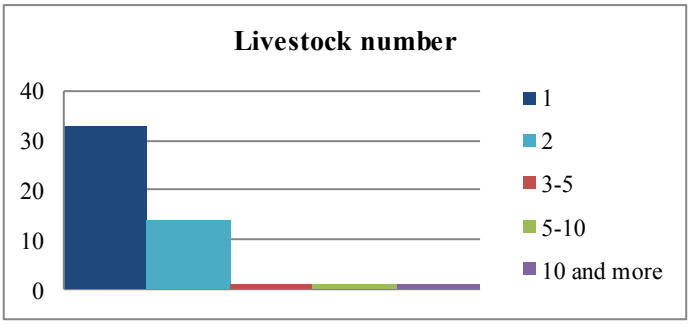
The basic method used to collect data in this research is the method of direct survey. For this purpose, the original questionnaire with 15 questions was made, which, according to the authors, represent the state of production and sales of cheese in the municipality of Štrpce in the best way. It involved issues related to the length of the cheese production, the number

of livestock they own, the methods of cheese production, the involvement of the family in the work, the daily amount of milk, the weekly production and sales of cheese, the method of sale, price, sales satisfaction, competition, assistance to livestock farmers, the existence and plans for the production expansion. The order of the answers to the questions asked was based on the five-point response, so-called Likert scale. The answers were ranged from 1 to 5, where the least favorable or desirable response was marked with 1, while the affirmative response or the highest offered value was marked with 5. The research included 12 villages in the municipality, with a total of 50 livestock breeder, producers of Šar cheese. There are no official data on the number of households involved in livestock breeding in the municipality of Štrpce. Based on the data from the field, available to the authors, this number is approximately 200 households. This confirms that a sample of 50 livestock breeders surveyed for the purpose of this research is very representative. Obtained survey data was processed in the IBM SPSS Statistics-version 23 software package and based on the results obtained a comprehensive linear regression analysis was performed. In order to ensure a more accurate presentation of the given topics, the methods of observation, descriptions, comparisons, analyzes, syntheses and others were also used. Due to the already mentioned fact that after 1999, there are no statistical data of the Statistical Office of the Republic of Serbia for the territory of Kosovo and Metohija, nor for the Municipality of Štrpce, the sources of the Municipality of Štrpce and the Ministries that are in the system of Provisional Self-Government in Priština were used, as well as the data from publications prepared by the international factors that have been operating in this territory for the last 18 years.

Results

The research that has been carried for the purposes of this paper has shown that nowadays fewer people are engaged in livestock breeding, but what is even more worrying is that these few livestock breeders have even fewer livestock. A survey conducted on a sample of 50 respondents, livestock breeders (25 male and 25 female) shows that majority of respondents, 66% of them, own only one livestock unit. 28% own two livestock units, and the rest of 6% owns from 3 to 10 livestock units, which represents a very bad statistic for this, once-so profitable branch of agriculture (*Figure 1*).

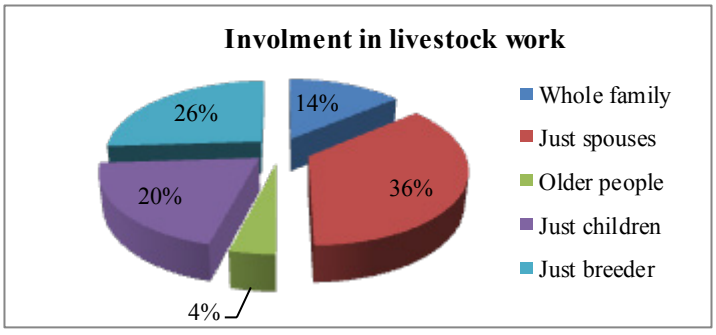
Figure 1. Livestock number in respondent households



Source: authors' research

More than half of the respondents (54% of them) have been involved in this business for more than a decade, while the number of those involved in the livestock breeding for a shorter period of time, up to 10 years, is much smaller. As already mentioned, cheese is mainly produced according to the traditional recipe, which is also confirmed by our research (66% of respondents use this recipe). Organic production method, without additives, is used by 10% of the respondents, the same percentage uses different recipes, while 14% of them use a recipe in which citric acid is used. In the municipality Štrpce, usually entire family is involved in the work with the livestock, because only such a job can be profitable. Previously, the participation of all family members was not questioned, both younger and older family members were equally involved in the field and in the stable. Nowadays, the situation is a bit different, the younger population is not so interested in working with the livestock, and if they work, they do the minimum. Basically, most of the work is done by the older family members. The majority of our respondents, 36% of them answered that only their spouses work, a quarter responded that the whole family was involved in the livestock breeding, a fifth of the respondents pointed out that children help them, while the negligible number of the respondents work without any assistance (*Figure 2).*

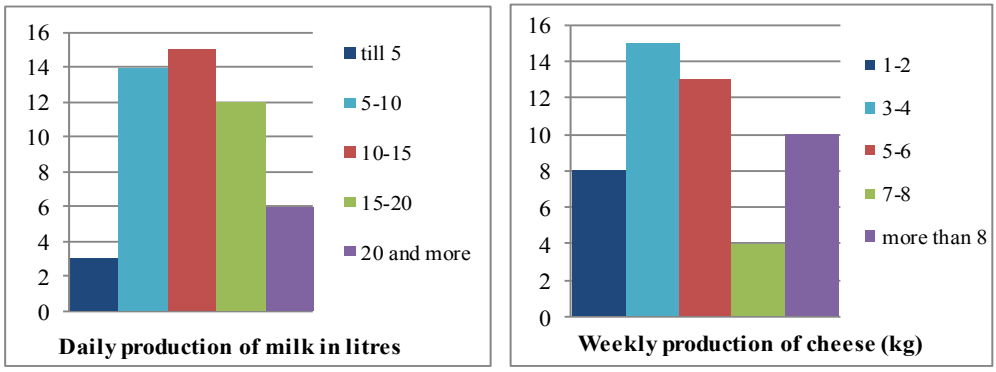
Figure 2. Structure of the sample according to family involvement in the process of production of the Šar cheese



Source: authors' research

When it comes to the amount of milk obtained from cows, according to the majority of responses, it ranges from 5 to 20 liters, while fewer respondents replied that they daily milk up to 5 and over 20 liters. Of these quantities, the majority of our respondents (30% and 26%) produce between 3 and 4, that is 5 to 6 kilograms of cheese. One fifth of all respondents produce more than 8 kg, while the rest, 8% and 16% produce between 7 and 8, that is, between 1 and 2 kilograms (*Figure 3*).

Figure 3. Milk and cheese production



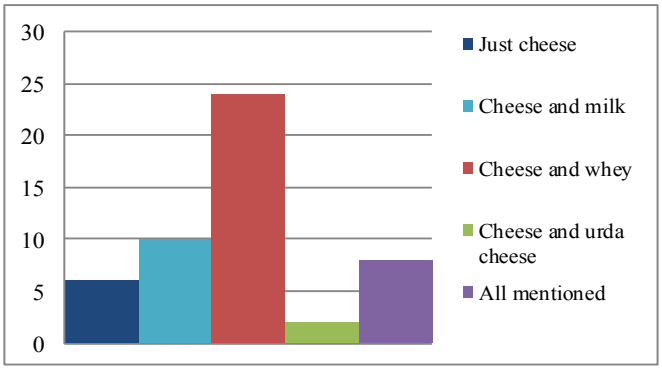
Source: authors' research

The respondents also answered the question of the weekly sale of cheese. The majority of respondents, 30% and 36% of them responded that they sell 1 to 3, that is, 5 to 6 kg per week. A quarter of them do not sell cheese at all, while 14% of them sell more than 7-8 kg. It should be noted that, generally speaking, the situation regarding the sale of cheese is very favorable for the producers in the municipality of Štrpce. Cheese is a very high demand commodity and it often happens that a buyer needs to wait longer to buy it, given the longer period of the cheese production. However, this is not the case with all producers. Some households have difficulties with the sale. There are more reasons for this, but above all, the most important is the customer loyalty. When customers buy cheese and are satisfied with it, they return repeatedly to the same producer, convinced that they will get the expected quality. Also, the cheese is purchased on recommendation, and there are also so-called "recognized producers" whose quality is not questioned. It's because quality is the most important feature for customers, even more important than the price. However, there are a lot more producers who are satisfied with the sale, which was also confirmed by our research. 18% of them are completely satisfied with the sale, a quarter is partially satisfied, while others express a certain amount of dissatisfaction with the sale of cheese.

The cheese is usually purchased directly from the producer, and in order to get their favorite delicacy, customers are ready to go to the most remote villages in the municipality. When visiting the cheese producers, usually, along with local plum or honey brandy, they taste cheese, buy certain quantities of it, but also often buy other domestic products that are offered. Even 60% of our respondents use this method of selling cheese, 16% of the producers sell cheese through agents, as well as to the local shops, restaurants and hotels. The current price of cheese per kilogram ranges from 6 to 10 euros for hard, full-fat cheese. Our respondents most often (even 80% of them) sell cheese at this price range. The rest 20% sell cheese at a price of up to 5 euros or at a price that is higher than 10 euros.

In addition to cheese, livestock breeders sell other types of dairy products: milk, sour milk, urda (green cheese), whey, etc. One fifth of our respondents sells only cheese. In addition to cheese, almost half of our respondents sell milk, while the rest of them sell other dairy products (*Figure 4*).

Figure 4. Structure of respondents by type of dairy products they produce



Source: authors' research

We have asked our farmers whether they consider existing cheese producers a competition. The majority, almost 60%, answered that they have a few competitors, while fewer of them think that competition is big. A small number of them, 10% say that there is no competition at all. However, it is important to note that, besides the Serbs in the municipality of Štrpce, the number of inhabitants of other nationalities involved in the production of this type of cheese is increasing. Also, in the last ten years in the Prizren area, an organized, factory production of cheese started. This cheese has a slightly different taste, so it is questionable whether it can be considered a competition to the cheese from Sirinićka Župa.

According to our research, when it comes to the profit earned from this job, it is not at the enviable level. This is confirmed by the fact that the livestock breeders generally have fewer livestock, which consequently leads to the production of smaller scale. Therefore, when considering all costs, work and labor, as well as the complexity of the production process, the profitability of this business is questionable. When asked if they can live from this job, the discouraging fact is that none of the respondent responded affirmatively. Most of them are visibly dissatisfied, and even 54% of them said that they can't make a living or barely can make a living from this job. The other respondents partially or in some way have settled their existence with this job.

In order to stimulate livestock breeding, which is already in the plan of all strategies for economic development of the municipality of Štrpce (Development plan of Štrpce municipality), assistance and incentives are also needed. In the last 18 years, after the arrival of international factors in this area, to this day, large funds have been allocated for the improvement of agriculture, livestock breeding, raspberry fostering, tourism, reduction of unemployment, or general economic development. According to the data of municipality of Štrpce, livestock breeders and farmers from this municipality were participants in the various projects of the Provisional Self-Government in Priština and its ministries, local self-governments, Serbian institutions, the European Union and the international organizations and donors such as USAID, IOM CARITAS, the Danish Refugee Council, various agencies and others. The majority of the participants in our survey, 78% of them were not beneficiaries, while the rest 12% received support from local authorities, 6% from international donors and 4% from the government in Priština.

The production expansion is also a basic prerequisite for both profit and livelihood. However, in order to increase the number of livestock units, it is necessary, above all, to have a certain capital and more importantly, to put a lot of work and effort around the livestock, which often presents big commitment for an average family. Therefore, it is not surprising that half of the respondents do not plan to expand. Still, the fact that the remaining 50% is considering some kind of expansion is the good news. Thus, 30% of them are thinking about additional livestock unit, 14% of them that they will surely expand their production with several livestock units, while 4% of them will start breeding other type of livestock. Only one respondent plans to expand, to double the number of livestock units and it is interesting to point out that this respondent is a female. This indicates to us that even in this business women show their entrepreneurial role and have a bold vision of the progress of their business. Given that a lot of residents of the municipality of Štrpce are young and middle-aged, as well as unemployed, livestock breeding and cheese production, with adequate technical assistance and financial incentives would be an ideal opportunity for the self-employment.

Discussions

Interesting facts were obtained by further analysis of the results. By determining the interdependence of all observed variables, we have confirmed some expected results, such as that the weekly sale of cheese depends directly on the number of the livestock units, the daily quantity of milk, weekly cheese production, as well as that it affects the satisfaction with the sales. Also, we came up to very interesting correlations that will help us in making conclusions of our research.

There is a statistically significant link between the variables "cheese production length" and "involved in livestock breeding" (p=0,007) with Pearson's correlation coefficient r=0,579, which means that with the increase in the length of cheese production, the number of household members involved in livestock breeding is also increasing. Also, a statistically significant result (p=0,000) is the link between the "number of livestock units" and "the method of selling cheese" (r=0,493). Therefore, with the growth of the livestock units, the sale increases as well, because other than selling at home, other significant buyers appear, such as supermarkets, restaurants, hotels. Another highly significant result (p=0,002) for the variable "number of livestock units" is its connection with "the method of cheese production" in which Pearson's coefficient of correlation is r=0,426, from which it can be concluded that with a greater number of livestock units, the method of producing cheese differs from the classical recipe (organic manufacture without additives, with citric acid production, recipe for kashkaval cheese). A similar example is the link between "daily milk quantity" and "the competition" (p=0,003, r=0,413). Therefore, one of the factors of increasing competitiveness in the market is reflected in the increase of daily production of milk.

The price of the product is an important factor in every business, including the production of cheese, which is also confirmed by this research. Thus, the "method of selling cheese" affects not only "the price of cheese", but the "weekly sale of cheese" as well. The massive the sales method is, the greater the price at which cheese is sold (p=0,000, r=0,508), and the weekly sale (p=0,001, r=0,464). The results indicate that, if the entire amount of cheese, taken from livestock breeders, is purchased by bigger supermarkets or hotels, the price would be, which is very interesting, much higher, and the sales on a weekly basis would be increased, too. Also, an interesting data was obtained by the

subsequent analysis that, if the competition on the market is higher, the price of cheese is higher (p=0,000, r=0,574), too. The exact same parameters were obtained when determining the link between the "price of cheese" and "the production of other dairy products". Competition affects both, daily amount of milk and the satisfaction with the sales. The bigger the competition, the higher the quantity of produced milk on a daily basis (p=0,003, r=0,413), as well as the satisfaction with sales (p=0,000, r=0,557).

By examining the link between the variables "support" and "the length of cheese production", a statistically significant result was obtained (p=0,005). It shows that Pearson's coefficient r=-0,389 is negative, which is interpreted in the way that our livestock breeders with long period of involvement in this business, mostly did not receive support, or obtained some, but not significant, from the local structures. On the other hand, the survey showed that new livestock breeders, involved in this job for a year, two or a few years, receive more support, predominantly from Serbian institutions, Kosovo and Metohija provisional institutions and international donors. The support also affects the "number of livestock units". The greater the support, the greater the number of livestock units (p=0,006, r=0,586). Also, as the number of units is higher, the existence is, of course, better (p=0,001, r=0,448). The analysis confirms the fact that when the weekly sales of cheese is higher, naturally the living of the livestock breeders and their families is better as well (p=0,004, r=0,403).

Finally, the results that say a lot about the survival of this branch of agriculture in the municipality of Štrpce in the future, which was actually one of the main motivations for our research, show that with the increase in support for the livestock breeders, the plans for the expansion of this job (p=0,004, r=0,665) would be far more serious. Undoubtedly, one of the most important roles in the future of livestock breeding in the municipality of Štrpce, and thus the future of the Šar cheese, have the respective municipal authorities. Livestock breeders in this region have the will to work, but they lack resources and someone to motivate them to work and improve the production as well as the method of placing dairy products. In order to improve the situation, it is necessary to work on increasing the capacities, that is, to increase the number of people involved in livestock breeding (Mladenović, 2017). The fact that, based on the Development Plan of the municipality of Štrpce, this is also the intention of local municipal structures is encouraging. It has already been mentioned that large funds are allocated for the economic development of agriculture in the municipality of Štrpce, so we hope that the same will be redirected to the improvement of livestock breeding and production of milk and dairy products.

Šar cheese certainly represents the brand of the municipality of Štrpce. Therefore, it would be expected to work on its branding, that is, protection of its geographical origin. The certificate of authenticity and geographical origin will open many doors for this dairy product. As stated by Jovićević-Simin et al., (2016) the product bearing the title of geographical origin is synonymous with quality in the market. Branding of the Šar cheese would enable its sale not just on domestic markets, but on the foreign markets as well.

The municipality of Štrpce, located in one of the most famous national parks in this part of the Balkans, with its natural characteristics and preserved environment, has a great potential for organic production of various products: honey, medical herbs and fruits. With the production and placement of organic products on the local markets, the

enclave can generate surplus income and thus create the economic basis for sustainable development of multifunctional agricultural households in Serbian enclaves (Maksimović et al., 2017). Another possibility for improving the production and sale of Šar cheese is the expansion of this activity in the field of healthy food and organic production of this dairy product. According to Popović-Vranješ et al. (2016), organic cheeses represent value added products that provide small milk producers with a sustainable source of income. They have the potential to revitalize farms, provide new jobs, and also to create new varieties of cheese with unique taste and new consumer experience. Changes in the production process in the direction of reducing environmental pollution and efficient use of resources in agriculture often result in higher yields, which together reflect the competitive advantage (Mladenović M. et al. 2017).

In rural areas, agrotourism is particularly important and in combination with organic food production it could represent a great opportunity (Pejanović et al., 2017). Rural tourism is a key factor in the activation and sustainable development of rural areas, which helps to preserve the local identity, tradition and customs, enforces home-made, traditional and eco-friendly production of healthy food (Đenadić et al., 2016). Municipality of Štrpce is widely known as a tourist center. Although after 1999, tourism is not at the same level as it was before, there is a potential for its development. For a rural area, such as this, the development of agrotourism would be a significant step towards overall economic development of this region. Šar cheese could definitely be one of the main products in the overall traditional gastronomic offer of this region.

Whichever of these methods of improving the production and sales of cheese the authorities select, the success is guaranteed. The reason for that is certainly the original aroma of Šar cheese, which is considered magical. Once you try it, you always come back for more. And, what is better for promoting a product than a satisfied customer?

Conclusions

The production of traditional, Šar cheese in the area of Štrpce municipality plays an important role in the economic and social development of both, entire municipality and its households. In this region, in the near past, every household was involved in the livestock breeding and cheese production, which however, nowadays is not the case. In a municipality of about 12,000 inhabitants, there are only about two hundred households that are following in the footsteps of their ancestors. Therefore, with the appropriate measures, it is necessary to preserve and improve the livestock breeding and production of milk and dairy products, in order to keep the Šar cheese in the leading position among the traditional products of this region in the future.

Based on the research and the analysis of all indicators, here are some of the authors' suggestions for improving the production and sales of cheese in the municipality of Štrpce:

- Increase the livestock units in existing households,
- Encourage the establishing of new small farms,
- Association of farmers in cooperatives,
- Improving production and sales,
- Implementation of European and world standards in the field of food production,
- Branding and protection of the geographical origin of cheese,

- Expansion of production in the field of organic food,
- Development of agrotourism.

The improvement of livestock production, production and sale of Šar cheese is an ideal path towards economic development of a sustainable municipality. Given that nowadays sustainable development is considered a top priority, it should also be the guiding principle for the relevant local structures in the municipality of Štrpce. Since this municipality has predispositions for competing with more developed European countries, it would be a pity not to exploit this potential in the way that will contribute to the improvement of the quality of life for the entire community as well as every household involved in cheese production. Because, when people are able to work and live from their work, the conditions for stay and survival on the territory of their ancestors will be created too.

Conflict of interests

The authors declare no conflict of interest.

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THE AGRICULTURAL PRODUCTS - MARKET STRUCTURE IN SOUTH-EAST EUROPE

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ABSTRACT

Purpose. The research subject is the analysis of exporting performance and international competitiveness of the Industry of agricultural products of SEE countries. Research goal is to examine the trends of total export effect, i.e. competitiveness effect (CE) trend, product effect (PE), geographical effect (GE) and residual effect (RE), as well as their components.

Methodology. Constant market share (CMS) approach is able to explain these effects in the case of the Industry of agricultural products in SEE countries.

Results. The conducted research covered 14 major products obtained from UN Comtrade, separated at four HTS code levels, in the period from 2007 to 2015. Conclusions. However, improvement of exporting competitiveness was still insufficient, considering that there was a more significant loss on other markets (EU, Russia).

Introduction

Research of competitiveness of the agricultural sector is very complex due to broad micro and macro influence, i.e. the influence on consumers, producers, sector as a whole, related industries, and global economy. It is important to observe the size of a company in order to adequately compare and identify countries that are major exporters (Giannakis, Bruggeman, 2015). In the same way as strong economies have a positive trade balance, countries with a developed Industry of agricultural products

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have a surplus in export of agricultural products. According to Chen and Holden (2018) within OECD countries there are positive trends in Germany, Great Britain and Ireland. In fact, thanks to significant tax incentives towards development of innovations, Ireland became the prime country to invest in the agricultural sector. The numbers are high, out of top 10 agricultural companies, 7 are in Ireland. Regarding Germany, it is necessary to emphasize that the industry of agricultural products have a high share in exports. Within the Danube region, Germany stands out with high share in export of chemical and Industry of agricultural products (Andersen, 2017). Sweden has a significant share in export of agricultural products within overall export. Swedish agricultural sector employs around 5000 people (Ferro, Otsuki, Wilson, 2015). High competitiveness of the agricultural sector is the result of innovations and growing investments in R&D. The agricultural industry's total cost for R&D in 2009 was 6.319 million SEK equal to 11.8% of the Swedish agricultural sector's aggregated turnover (Zanden, Verburg, Schulp, Verkerk, 2017).

A part of the funds was provided by the industry and a part was donated by the state. As Grüner and Muller, (2016) points out, the Industry of agricultural products amounts to 6% of total Swedish export. Even though there were certain oscillations within the period, there was a positive trend. An increase in positive trade balance in countries that export agricultural products was the result of a decrease of import and investment in R&D of new and perfecting existing products. It is quite significant to note that universities participated simultaneously with companies in the research (in 2003 they participated with 22% of total R&D) (Milojević, Mihajlović, Cvijanović, 2012). According Musolino, Massarutto, Carli (2018) the EU's Industry of agricultural products is a strategic asset to the EU economy with its annual output of € 220 billion and its substantial investment in R&D compared to other manufacturing sectors. It's important to note that there is high territorial and sectorial concentration of FDI in India. FDI hasn't helped in solving one of the biggest problems, unbalanced regional development and thus convergence of industrial structures and income among regions. It should be emphasized that the Indian Industry of agricultural products had high growth rate in recent years, thanks to the commitment of MNK agricultural sector to increase the quality and quantity of FDI in R&D.

There was an increase in global agricultural products market in the analysed period. Size of the global agricultural products market reached 1.2 billion $ in 2017 with a total yearly growth rate of 3-6% and the developing markets are key development carriers. Nominal expenditure value of agricultural products reached 373.9 billion dollars in 2014. Real consumption of agricultural products per capita amounted to 995$ globally, which is almost triple the amount from 1995. There was an increase in expenditure for agricultural products in Northern America with an average rate of 6.4% a year, Latin America around 6.1% a year and in Western Europe only 2.2% a year from 2014-2017. The development of agricultural programme in China causes an expectation of an increase in expenditure for agricultural items in Asia and Australia for 10%. Large overall investment, especially in developing countries is the result of an increase in

agricultural technology market with expected growth at an average rate of 5.0% a year in the period from 2013-2020, i.e. the projected sales will increase from 363.8 to 513.5 billion dollars and carriers of these activities are multinational companies and FDI. (Shafiullah, Selvanathan, Naranpanawa, 2017)

When traditional exported products are in mind, Croatia had a comparative advantage before the transition period and kept such position afterwards (Andersen, Jensen, Skovsgaard, 2016). Development of the agricultural sector largely depends on procurement of contemporary technology. Researches have shown that in Serbia's case, the state didn't have a long term development strategy and didn't use an active programme of tax policies to help the development of the agricultural sector in the transitional period. In developing countries of Africa, Asia, Latin America and Eastern Europe it is a big problem, because 50% of agricultural products that consumers receive are forgeries, unlike EU where this is less than 1%. As it is pointed out, there is a need for mutual fight and cooperation on national and international level of all participants (Vukoje, 2013).

Research of the agricultural sector in global economy has multiple aspects in literature. Authors examine the role, i.e. significance of the agricultural sector in economic growth, its influence on the healthcare sector, influence of FDI on performances of agricultural companies etc. Majority of authors start in their studies from export of agricultural products analysing competitiveness indexes on the international market. Research of Croatian Industry of agricultural products sector showed that Croatia has expressed comparative advantages, significant added value in exports, i.e. it achieves benefits in international trade of agricultural products, even though the share of this export in total exports is small. As Buturac points out „biggest benefits are achieved in the exchange of agricultural products"(Andersen, Jensen, Skovsgaard, 2016).

Analysis of competitiveness of the agricultural sector in OECD countries has shown that Germany is the most important trade partner of agricultural products of many countries. Positive results are present in Denmark, Ireland, Slovenia, Sweden and Great Britain, where the share of exports of agricultural products in total exports is high. Schmitz, Zhu and Schmitz, (2016) have pointed out in their competitiveness analysis that Germany has positive comparative advantage in export of agricultural industry, where the Industry of agricultural products has a leading role. Aw and Lee (2017) concluded that highly developed countries achieve positive comparative advantage in exports, thanks to advancement of the sector. It is a general conclusion that the Industry of agricultural products should: encourage transfer of knowledge and technology, promote marketing and other promotional activities, stimulate R&D, train researchers, raise awareness on growing markets and competition, especially in Asian countries and establish strong partnership with important clients in the coming period. In Latin America, the Columbian market is the fourth largest. Competitiveness research on domestic and foreign markets has shown that Columbia imports raw materials for production of generic agricultural products, produces and exports agricultural products of low complexity.

Zekić and Šegrt, (2015) point out that the reason for the high production costs associated with supplies and logistics that affect export growth of the Colombian agricultural sector is that the value of products is the sum of costs and margins that comprise the price paid by the final consumer. Many intermediaries, cost of qualified work force and low level of investment cause additional load. This makes it possible for the Industry of agricultural products to stay competitive only on a local scale. Jiao, Mongol and Zhang (2018) analysed competitive advantages of a company in the agricultural sector in the period from 1971-1989. Researches have shown that R&D and sales force expenditures have indirect and direct effects, respectively, on sustained competitive advantage. Shepherd and Wilson, (2013) point out that on the international market, advertising agricultural products and agricultural products doesn't contribute to exported volume. Instead, quality of product and skill of the work force have a positive and statistically significant influence and FDI have a negative influence on exporting performances of a company. Unlike other industries, it has been noted that in the Industry of agricultural products foreign owned companies export less and are more focused on the domestic market. It is a conclusion that an increase of competitiveness in Indian economy influences global competitiveness of the Indian agricultural industry. Vozarova and Kotulic, (2016) monitored the competitiveness of the Australian Industry of agricultural products in the period from 1975-1992 and concluded that it had a significant increase in size. However, researches of comparative advantage in exports of agricultural products have shown that Australia has a negative position and a small share in export of agricultural products with regard to total exports.

Comparing Italy and Netherlands to OECD countries, it can be concluded that they are net exporters in agricultural products during 1975-1991, and the they have very large intra-industry trade indexes for the Western European countries (Belgium, France, Germany, Italy, the Netherlands and the U.K.). On the other hand, Australia exports agricultural products to neighbouring countries such as New Zealand, Hong Kong, Malaysia, Philippines and Thailand. An improvement of infrastructure and technology would have a positive impact on long term comparative advantage. Dealing with exporting performances of agricultural companies, Vozarova and Kotulic, (2016) point out that productivity is an important factor that determines the internationalization strategy.

Strengthening companies on the domestic market, i.e. the companies that manage to leave the low profitability business regime will have a more favourable status on the global market. They concluded that „reducing market barriers, improving factor mobility and providing innovative environment are the basis and assurance of overall improvement of Chinese manufacturing sector". Caffaro, Mirisola, and Cavallo, (2017) performed a study on the influence of factors on export of agriculturalproducts from Sweden. Analysis covered the period from 1995 to 2010. Empirical findings show that GDP is one of the most significant factors in explaining the value of exported agricultural products. Physical distance from an export destination is in negative relation to export. Price per kilogram is in positive correlation with GDP, while there is no statistical significance of the influence of membership in an union, like for example the EU. However, results have shown that smaller exporting destinations, such as members of the customs union pay lower price per kilo in relation to

other countries. Swedish export is larger in English-speaking countries and the author's conclusion was that cultural similarity doesn't have any influence on the value of export.

Materials and methods

Key features of the Industry of agricultural products in SEE countries in international trade are growth of export orientation, trade deficit (except Slovenia), expressed manufacturing and market concentration. SEE countries have realized 3.2 billion euros in export of agricultural products in 2015. Simultaneously, due to a significantly larger import than export, majority of countries had a relatively low coverage of imports by export. It also indicates that there is a significantly larger consumption than production of agricultural products. Confirmation of the unused export potential and insufficient orientation of the Industry of agricultural products towards export is the share of the analysed country of 0.68% of exports in total world trade. However, it is encouraging to note that there is a mild increase of this share due to above average growth of exports in recent years in all countries (except Montenegro). There is also an increasing significance of the Industry of agricultural products in overall export and economic activity of SEE. For example, share of agricultural products in overall export from 2006-2015 increased from 4.4% to 5.8%.

The authors have shown further in the paper features of export competitiveness and mutual trade with agricultural products in order to research production, geographical factor and influence of competitiveness on total export movements by using the CMS model (Table 1.).

Table 1. Export Performance Indicators in 2015

	Export per capita in 2015 (euro)	Share of total countries export in 2015 (%)	Share in world export in 2015 (%)	Annual export growth rate 2006-2015 (%)	Export share in SEE countries in 2015 (%)	Unit value of export in 2015 (euro/kg)
Bosnia and Herzegovina	14.62	1.12	0.0106	12.12	28.51	29.08
Croatia	133.87	4.90	0.1169	8.71	15.80	113.08
Macedonia	30.79	1.57	0.0131	6.10	76.67	10.69
Montenegro	10.69	2.09	0.0013	-3.04	97.17	5.44
Serbia	27.96	1.65	0.0411	6.82	21.92	11.31
Slovenia	1157.57	10.00	0.4924	7.53	12.84	67.70
SEE Countries	166.68	5.79	0.6757	7.67	14.23	48.99

Source: Authors calculations based on data from the UN COMTRADE Database.

Comparison of the analysed countries reveals that Slovenia has the biggest contribution to global export with 0.49%, then Croatia with 0.11% share. Share of other countries ranges from 0.001-0.05%. According to other export indicators (export per capita, share of total countries export, trade balance) Slovenia shows the best competitive position on exported markets. The only exception is Croatia, who manages to achieve the greatest unit price and thus the biggest value of this indicator.

It is especially interesting to research mutual trade of agricultural products among analysed countries. It's with that purpose that the exporting matrix was constructed.

Analysed countries have cumulatively realised around 466.2 million euros of export on SEE. In relative amounts, it accounts for 14.2% of total export of agricultural products. Comparison of the analysed countries shows significant heterogeneity in absolute value of export and orientation of exports towards mutual markets. Even though the absolute biggest exporters within SEE countries are Slovenia and Croatia, they show significantly smaller orientation of export towards this market, in relation to other analysed countries. For example, out of overall exports of the agricultural industry, Slovenia only refers 12.8% towards this market and Croatia 15.8%. At the same time, other countries show significantly larger orientation of exports towards mutual markets: Montenegro – 97.2%, Macedonia 76.7%, Bosnia and Herzegovina 28.5%, Serbia 21.9%. Part of the reason is that Slovenia and Croatia are members of the EU, letting them have undisturbed placement of goods and therefore an orientation towards this market. On the other hand, the rest of SEE countries are participants of CEFTA agreement so they have partial facilitations of their competitive position on the CEFTA market. Considering that in most of these countries, production and export structure are explicitly concentrated in a few business subjects, such results can partially be explained by existing trade relations and prevailing business policies of agricultural companies.

CMS analysis is applied to quantification of export performance and sources of international competitiveness of the Industry of agricultural products in SEE countries. In economic literature, various factors have been identified as potential factors behind the decrease of share of agricultural export in total world trade:

a) National exports in agricultural products may be concentrated on products that are experiencing a lack of demand;

b) The concentration of exports of agricultural products to relatively stagnant regions;

c) Weak international competitiveness of the domestic agricultural industry.

Constant market share approach (CMS) is able to explain these effects in case of the Industry of agricultural products in SEE countries. Scherer, Verburga and Schulp, (2018) was the first to apply the CMS method in research. Methodological and empirical improvements of the CMS technique are proposed by numerous authors who all used a similar concep.

According to the CMS concept, export performance of a certain industry mainly depends on product composition, geographical distribution of export and the level of international competitiveness. Trends in export of the Industry of agricultural products in SEE countries based on this methodology could be decomposed in three different parts.

According to the revised version of the constant market share (Backović, Vuleta, and Popović, 2014) trends in total exports can be decomposed into four components:

$$TE = CE + PE + GE + RE$$

Where

TE= total effect

CE= competitiveness effect

PE= product effect

GE= geographical effect

RE = residual effect

Total effect is calculated as follows:

$$TE = \left[\frac{\sum_m \sum_p q^t{}_{m,p}}{\sum_m \sum_p Q^t{}_{m,p}} - \frac{\sum_m \sum_p q^{t-1}{}_{m,p}}{\sum_m \sum_p Q^{t-1}{}_{m,p}} \right] \times 100$$

Competitiveness effect:

$$CE = \sum_m \sum_p 0.5 \times \left[\frac{q^t{}_{m,p}}{Q^t{}_{m,p}} - \frac{q^{t-1}{}_{m,p}}{Q^{t-1}{}_{m,p}} \right] \times \left[\frac{Q^{t-1}{}_{m,p}}{\sum_m \sum_p Q^{t-1}{}_{m,p}} + \frac{Q^t{}_{m,p}}{\sum_m \sum_p Q^t{}_{m,p}} \right] \times 100$$

Product effect:

$$PE = \sum_m \sum_p 0.5 \times \left[\frac{q^{t-1}{}_{m,p}}{Q^{t-1}{}_{m,p}} + \frac{q^t{}_{m,p}}{Q^t{}_{m,p}} \right] \times \left[\frac{\sum_m Q^{t-1}{}_{m,p}}{\sum_m \sum_p Q^t{}_{m,p}} - \frac{\sum_m Q^t{}_{m,p}}{\sum_m \sum_p Q^{t-1}{}_{m,p}} \right] \times 100$$

Geographical effect:

$$GE = \sum_m \sum_p 0.5 \times \left[\frac{q^{t-1}{}_{m,p}}{Q^{t-1}{}_{m,p}} + \frac{q^t{}_{m,p}}{Q^t{}_{m,p}} \right] \times \left[\frac{\sum_p Q^t{}_{m,p}}{\sum_m \sum_p Q^t{}_{m,p}} - \frac{\sum_p Q^{t-1}{}_{m,p}}{\sum_m \sum_p Q^{t-1}{}_{m,p}} \right] \times 100$$

Residual effect equals the difference between total effect and individual components:

$$RE = TE - (CE + PE + GE),$$

where:

q^t=aggregate exports of an industry

q^t_p=exports of the p-th commodity of an industry

Q^t_p = world exports of the p-th commodity

s^t=aggregate exports share of a certain industry in total world exports of the same industry

s^t_p = share of the p-th commodity of a certain industry in the p-th commodity of world exports of the same industry

m = market index

p = product index

t = time

Constant market share model was used to explore export performance of the Industry of agricultural products of SEE countries on the global market from 2007-2015. The analysis of changes in export shares was based on three sub-periods, 2007-2009, 2010-2012, and 2013-2015. The formation of three sub-periods makes the analysis more plausible and avoids issues related to business cycles. The empirical work was focused on fourteen major products. Export data set was obtained from UN Comtrade database. Data set was disaggregated at four HTS code levels. Data values are expressed in current million Euros. The referent period is 2007- 2015.

The CMS method presents a convenient analytical framework, but the application and interpretation of the method has some limitations that must be taken into account. The most significant limitation of the CMS is that it is applied to a discrete time period. Qiu, Zhu, Wang, Cheng, (2007) proposes a satisfactory solution for this limitation, by applying decomposition to discrete observations at the beginning and the end of the period. Qiu, Zhu, Wang, Cheng, (2007) has been extended using dynamic development, with the decomposition method applied to each observation of the time horizon, and the results of the CMS analysis are time series. Interpretation of the residual effect is not as straightforward as the interpretation of competitiveness, product, or the geographical effect. A negative residual effect implies a failure in maintaining constant market shares and according to basic assumption of CMS analysis, this residual effect is related to changes in relative prices. However, the basic assumption ignores the impact of numerous other factors that affect the stability of the country's exports. The most important are: differences in quality, development of new exports; improvements in efficiency of marketing or in the terms of financing export activities. In spite of those limitations and constraints, dynamic consideration of the CMS analysis in general successfully identifies changes in the trade structure and competitiveness over time.

Results

The CMS effects – total effect (TE), competitiveness effect (CE), product composition effect (PE) and geographical distribution effect (GE) have been calculated for export of the Industry of agricultural products on the global market. A positive value of individual effects indicates a gain in market share of the Industry of agricultural products while a negative value indicates a loss.

Regarding total effect (TE) in the global market, negative signs for SEE countries are recorded in 2009 and in the period, from 2014-2015 which is primarily attributable to the negative competitiveness effect (CE). It reveals the inability of the Industry of agricultural products of SEE countries to increase their market share due to competitiveness factors, independently of structural developments in the market or in product trade patterns. A decrease in export competitiveness in 2009 was as expected considering the consequences of global economic crisis which among other things, shed on the Industry of agricultural products of SEE countries. Despite export recovery from 2010-2013, newer movements from 2014 and 2015 confirm an ever increasing competitive pressure on international exported markets and a decrease in exporting competitiveness. Observing the distribution of CMS effect among countries, it can be

said that the biggest contribution to such movements was given by the most developed country in agricultural products – Slovenia. Expectations of positive influences for export of agricultural products due to Croatia's admittance to the EU, were not achieved in its first years of membership (2013, 2014). However, in 2015 with Montenegro, Croatia was the only country in SEE to note a positive total effect (TE) and competitiveness effect (CE). Results for Serbia, Bosnia and Herzegovina and Macedonia also confirm that the competitiveness effect had the biggest effect on export. Even though all SEE countries improved their mutual trade of agricultural products in 2015 and in such a way improved their exporting competitiveness on the SEE market, it wasn't sufficient to increase overall export competitiveness, considering a more significant loss of competitiveness on other exported markets (EU, Russia).

Although product effect (PE), cumulative for SEE countries, was negative in most years of the observed period, it was very close to zero. It can be concluded that product mix of exported agricultural products on the global market is not an obstacle for export expansion. Export of agricultural products of SEE countries is concentrated on commodities in which foreign demand is relatively stable even in periods of economic crisis.

The geographical effect was negative in years 2009, 2012 and in the period from 2014-2015. It reveals an unfavourable geographical export structure of the Industry of agricultural products of SEE countries due to high export concentration to markets in which demand is growing slower (EU) in comparison to fast growing world markets. The EU presents a large share in the export structure of agricultural products of SEE countries, which is as expected considering the closeness of the market, existing trade connection, membership and integration processes of SEE countries in the EU. Negative values of geographical effects (GE) suggest the need of larger investment in research of fast growing markets.

In general, it is obvious that loss or gain of competitiveness of the Industry of agricultural products of SEE countries is the most important factor that determines its share of the international market. The impact of product structure is more or less neutral while regional reorientation of export to countries with stable growth of international trade could be helpful for export performance of the Industry of agricultural products in analysed countries.

The mentioned increase in market share is the result of a very uneven movement during the observed period. After the decrease of exports in 2009, which was the consequence of a drop in foreign demand, the Industry of agricultural products recovered and reached even higher exports than recorded in the prerecession period. The relatively weak domestic demand and highly competitive domestic market are factors that contributed to reorientation of domestic agricultural producers to international markets. Additionally, the integration process to the EU brought new challenges in front of the Industry of agricultural products in SEE countries as well as the reconstruction of production mix and technology, which was needed in order to regain competitiveness on the EU market. Despite an increase from 2007-2015, the newest trends from 2015 confirm a fall in export competitiveness in most of exported products. The fall in competitiveness was partly a consequence of insufficient export orientation on fast growing markets,

as well as insufficient mutual trade with agricultural products, which would be able to significantly contribute to the improvement of overall export competitiveness, considering the closeness of the market, knowledge of tastes and consumer habits (Scherer, Verburg, Schulp, C.J.E. 2018), existing trade connection. At the same time, a negative sign in product effect (PE) in 2015 in most products shows the need of larger investment in product innovation.

Discussions and Conclusions

Agricultural products and agricultural products market in analysed countries is characterised by domination of foreign producers, large market concentration, expressed pressure by competitors, as well as frequent takeovers and mergers of businesses. According to production volume, number of businesses and employment, Slovenia's Industry of agricultural products is the best and Croatia's is right behind her. According to the observed economic structure, Montenegro has the lowest representation of its Industry of agricultural products in its economics structure. In recent years, agricultural producers in SEE countries have moved a major part of their production to foreign markets. Some of the reasons are: relatively small domestic markets, an ever increasing competitive pressure and decreased domestic demand due to recession and slow economic growth. The integration process improved exports on foreign markets. On one side they ease access to foreign markets, and on the other bring larger exposure to competitive pressure on those markets. Therefore an orientation towards export and improvement of export competitiveness are preconditions to successful development of the agricultural industry.

Research results indicate that SEE countries enforced their mutual trade of agricultural products and therefore created prerequisites to promote competitiveness on SEE market. However, there wasn't sufficient increase in competitiveness in the analysed period in order to mitigate the loss made on other exported markets (EU, Russia). With the exception of Slovenia, import is significantly larger than export in SEE countries, which conditions a relatively small coverage of import through export. High import rates point to a significantly larger consumption of agricultural products in relation to their production. Despite that, the Industry of agricultural products has an ever increasing significance on overall export and economic activity of SEE countries. Out of the analysed SEE countries, Slovenia and Croatia have the biggest share in total world export. Analysis of other export indicators (export per capita, share of total countries export, trade balance) has a similar export structure. Value of export of SEE countries on mutual market shows significant heterogeneity. Slovenia and Croatia have the biggest export value, but the lowest export orientation towards mutual market, primarily due to the fact that they are oriented towards EU market. Serbia, Bosnia and Herzegovina and Montenegro have the biggest mutual trade rates thanks to their membership in CEFTA.

Total effect (TE) on the global market is negative for SEE countries in 2009 and in the period from 2014-2015, which is in direct correlation with negative values of competitiveness effect (CE). Analysis of CMS effect distribution in analysed countries

shows positive values in Slovenia throughout the whole period with the exception in 2009 and in the period from 2014-2015. Results for Serbia, Bosnia and Herzegovina and Macedonia are extremely unfavourable and show the presence of negative total effect (TE) and competitiveness effect (CE) correlations. Although product effect (PE), which is cumulative for SEE countries, was negative in most years of the observed period. At the same time, negative value of product effect in most countries shows the need of investing in product innovation. The geographical effect was negative in years 2009, 2012 and in the period from 2014-2015. Competitiveness of the Industry of agricultural products of SEE countries is a deciding factor for positioning of individual economies on the international market. Influence of product structure on total effect (TE) is neutral while geographical orientation is significant for promotion of exporting performances in the Industry of agricultural products of the analysed countries.

The integration process of SEE countries in the EU brings new challenges in front of the Industry of agricultural products as well as the need for reconstruction of production and promotion of technology in order to restore competitiveness. Despite an increase of agricultural products in market share of exports in the analysed period, trends from 2015 confirm a fall in export competitiveness in product. A fall in competitiveness is partially a consequence of insufficient export orientation to fast growing markets, as well as insufficient mutual trade in agricultural products, which would, considering closeness of the market, knowledge of tastes and consumer habits and existing trade connections be able to contribute to a significant improvement of export competitiveness.

Conflict of interests

The authors declare no conflict of interest.

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ANALYSIS OF THE FINANCIAL POSITION OF ENTERPRISES IN PRIVATIZATION IN THE AGRICULTURAL SECTOR IN SERBIA

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ABSTRACT

Privatization as a phase of the transitional process also included agriculture. The most attractive enterprises in agriculture, primarily in the food industry, were privatized in the first wave, while the process of privatization of other less attractive companies was slowed down and implemented mainly by the auction model. The remaining companies waiting for the privatization process are not attractive and there are problems that are expressed through poor financial position and relatively low potential. An exception is made by PKB Corporation, which has a potential and relatively stable market, making this company an acceptable option for investors. The financial position of the companies that are ready for privatization at this moment and which is one of the factors of negative influence on the decision of the investor was analyzed using the Altman Z'-score model, the Kralicek Quick test and the balanced growth model. All tests have shown that the analyzed companies are in a bad financial position and that the future investor will have to invest significant funds in financial consolidation, balancing cash flows and investment in order to ensure adequate development and efficient business.

Introduction

The privatization process in Serbia is perhaps the most important stage in the transition of the economic system to a free market system. This process encompassed all branches of the economic system and thus agriculture. This branch of economy is assessed in literature, research and practice as insufficiently developed with significant structural problems, economically underdeveloped, in the foreign market inadequately competitive, and companies in this branch are largely financially helpless. Privatization

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of enterprises in agriculture was first carried out in activities that were otherwise attractive before privatization, so after the wave of privatization companies remained in great difficulty with the uncertain result of privatization. Large agro-industrial conglomerates are largely fragmented, with the result that attractive segments are retained and a large number of workers have lost their jobs. With the abolition of the Privatization Agency, the powers of the exit agency have been transferred to the Ministry of Economy that manages the privatization procedures. Table 1 shows the list of privatization companies in the field of agriculture with current status. On the list, there are 10 companies, of which in four cases there is a possibility of publishing a public call, in one case, activities related to the pre-preparation of the reorganization plan are in progress, after which it will be possible to announce a public call, while for the other five companies, because of the issues that need to be resolved. This paper analyzes the financial position of those companies for which the publication of a public invitation is possible. The analysis does not cover companies for which a public call can not be announced and two companies that are micro levels with insignificant financial indicators. Enterprises that are included in the analysis are: PKB Corporation ad, Padinska Skela, Backa ad, Sivac and Plantaza doo, Velika Drenova. The sample was analyzed by Backa ad, Sivac, for which activities related to the pre-prepared reorganization plan are in progress because they are not in question the legal obstacles in the foreground and the analysis of the financial position of this company shows the justification of the procedure in which it is currently in place. The aim of the analysis is to show the financial position of the company that will be privatized by pointing to the problematic elements of the financial position that will certainly influence the decision of future investors how much will be interested in the privatization of these companies. The problematic of the financial position of these enterprises is a reflection of the economic position of agriculture as an economic branch, so no attractive results are expected. The elements of the financial position of these companies will point to the potential future directions of restructuring the financial, organizational and technical structure of these companies. This analysis will show the problems of the agro-industrial sector as the subject of the analysis is the last large agricultural conglomerate such as PKB Belgrade.

Table 1. Companies and their status in relation to the privatization process

	Company	Status
1.	Jadran a.d., Nova Gajdobra	Public announcement is not possible, privatization is possible after the sale/ cancellation of own shares
2.	Airport Agricultural Operations Ltd., Belgrade	It is not possible to publish a public invitation - during the realization of the conclusion of the Government of the Republic of Serbia
3.	Backa a.d., Sivac	During the activities related to the pre-prepared reorganization plan
4.	Branko Gleđa dp, Zrenjanin	Bankruptcy
5.	Omoljica a.d., Omoljica	Public invitation not possible - there are requests for restitution

	Company	Status
6.	PKB Korporacija a.d., Padinska Skela	Possible announcement of the public invitation - the most optimal privatization model is under consideration
7.	Plantaza d.o.o., Velika Drenova	Possible public call announcement
8.	Ribarsko gazdinstvo a.d., Beograd	Public invitation not possible - there are requests for restitution
9.	Simpo Vlasina d.o.o., Vranje	Public invitation-privatization
10.	Simpo Cvece d.o.o., Vranjska Banja	Public invitation-privatization

In the analysis of the financial position of these companies, the Altman Z'-score model, the Kralicek's Quick test and the balanced growth model.

Materials and literature review

The privatization process in Serbia started in 1989 by passing regulations that regulated this area in various ways and through different models. Starting from January 30, 2002, when intensive privatization began, as of July 28, 2009, it was privatized in the activities of agriculture, forestry and water management, by the auction method of 126 companies with a total of 13,341 employees, and by the method of tendering 10 companies with a total of 6630 employees (Zdravković et al., 2010). The privatization process did not proceed as expected. In fact, it can be concluded that this process had even negative effects. By 2011, 153 agricultural enterprises and combines were sold for about 280 million euros, after which 38 contracts were terminated (Vehapi and Šabotić, 2015). Agriculture is in second place in the number of jobs lost. About 65,000 people lost their jobs. Privatization as a socio-economic process should also aim to solve accumulated multi-annual agrarian problems. According to (Pejanović. 2005, 210), the agrarian problem is the totality of the economic and social problems that arise in the society due to changes that are happening or will happen. The author expresses the opinion that the current course of agriculture transition has not solved the agrarian problem in our country, but has intensified it and it is becoming more and more intense. (Mihailović et al., 2013). The necessity of privatization is a position that is presented as one of the conditions of adjustment to global economic changes. Global changes in the agrarian sector require the liberalization of the market and the change in the ownership structure of the company (Bogavac-Cvetković et al., 2010). The existing agrarian structure is not the cause of the situation in Serbian agriculture, but rather the result of an inadequate long-term relationship with agriculture. Foreign investments are not interested in small holdings and the Law on Agricultural Land is perceived as an obstacle to investment (Jelić, Jovanović, 2010). Estimates of the state of agriculture in Serbia are not optimistic. The crisis in agriculture in Serbia lasts for a long period of time, and the development of agriculture contains chronic problems caused by the absence of systemic and continuous measures of economic policy (Pejanović, 2009). The development of agriculture is related to foreign direct investments and the development of other activities. In the food industry, foreign direct investments are present

in those activities that were attractive even before privatization. However, foreign direct investment in primary agricultural production is very modest. According to Kapor (2009), the reasons for this investment treatment of agriculture are the exposure of these investments to higher investment risks in other areas due to the impact of weather, climate, infrastructure shortages and land and human resources management. Changes are necessary. According to Pejanović and Tica, 2004, the former socialist company is in its disadvantage, abandoned, obscene, obsolete, bulky, overworked, indebted, insolvent, insolvent and incompetent for any competitive struggle in the foreign market. It is necessary to restructure and privatize it, or vice versa. In the current course of privatization, according to Aničić et al. (2016) were first privatized successful companies. For example, the investment fund "Salford" controls 60% of domestic dairies, and successful companies in the production of sugar, beer, water planners, etc. have been sold. According to the mentioned authors, nobody paid attention to what should be sold and the capital increase as one of the best privatization solutions failed. During this time, the solvency of the companies is not at a satisfactory level. According to Pejanović et al. (2006) Transition Reforms in Agriculture did not give the expected positive effects or how the authors cited the effects are modest. In support of this paragraph, it is pointed out that the crisis in agriculture is not overcome, while in some segments it has been deepened and there has been no change in the economic situation of agriculture at the macro level, while at the micro level there has been no restructuring of economic entities in the agri-economy. In the presentations , the prevailing view is that agriculture was neglected and that the problems of structural and economic nature were caused by the neglect of systematic and economic solutions that would have an incentive character. The financial performance of the agro-industrial sector is not good. The estimates were presented in a survey conducted by Đuričin and Beraha (2014). The results of the survey showed a poor yield in the agro-industrial sector, 40% of the analyzed companies have a value of financial power below average, and 40% of enterprises in the structure have the dominant borrowed funding sources. Agriculture and its related activities will suffer great effects of association in the context of the protection system (Petrović et al., 2006), as it will share a system that provides less protection than it is today. This will generate greater exposure to competition in the EU internal market.

Methodology

Starting from the main goal of this paper to determine and show the financial position of companies in the privatization process in Serbia, we consider it to be the most adequate Altman Z'-score model. Altman's original Z-score model (Altman, 1968) developed and eventually came to various forms of this model (see Altman 1983; Altman, 2005). This model was applied in various case studies in Serbia (Jakovčević and Andrašević, 2011; Begović et al., 2014, Kuč 2015, Lončarević 2015, Muminović et al., 2011). In addition to this model, we also applied the Kraličekov Quck test as well as the model of balanced growth (Walch, 2003) Below is a more detailed overview of the economic-statistical models we used in the analysis of the selected companies.

The original Altman Z-score model emerged as a model for predicting bankruptcy in developed financial markets. The original Z-score model contains five financial indicators on the basis of which the financial situation of the company is interpreted.

Z-score is calculated based on the following formula:

$$Z = 1.2 \bullet X1 + 1.4 \bullet X2 + 3.3 \bullet X3 + 0.6 \bullet X4 + 1.0 \bullet X5 \quad (1)$$

The above symbols in the discriminatory function have the following meaning:

Z = the overall index, which referred Z-score;

X1 = working capital / total assets

X2 = retained earnings / total assets

X3 = earnings before interest and taxes / total assets

X4 = market value equity / book value of total debt

X5 = sales / total assets.

This model was not applicable to companies operating in developing markets, so Altman modified the original model. The model is adapted to the business environment in emerging markets by introducing a change in indicator X4. Instead of the market value of equity, it is the book value of capital. In addition to this change, the indicator's weights have also been changed, so the new Z'-score model has changed the shape into a new function as shown:

$$Z' = 0.717 \bullet X1 + 0.847 \bullet X2 + 3.107 \bullet X3 + 0.420 \bullet X4 + 0.998 \bullet X5 \quad (2)$$

The limit values of the original model have also been changed. Companies successfully operate in a safe zone if the value of Z'-score is greater than 2.90, and companies with a value of 1.23 operate in a distress zone where the likelihood of bankruptcy is high. Between the limit values of 1.23-2.90 there is a gray zone in which businesses threaten bankruptcy but have the chance to improve their business. For the calculation of Z'score data from the public financial reports of analyzed companies from the database of the Serbian Business Registers Agency (SBRA).

The Klaricek Quick Test was developed in 1990 and provides the opportunity to quickly assess the company's insolvency. This estimate is based on the calculation of four indicators, the two indicators of financial stability and two profitability indicators (Didenko et al, 2012). The test includes the area of financing as the potential of enterprises and income as a way of using potentials. Based on the results of the test, an area for which a more comprehensive analysis of the problem is needed for timely corrective influence is determined (Jakovčević, Andrašić, 2011, 188). The areas to be assessed are the level of self-financing, the duration of the debt repayment, the percentage of Cash Flow in revenue and the viability of the funds. Depending on the obtained values of the components of the model, a certain number of points from 1 to 5 is assigned, which also signifies the quality of the company's financial standing. The companies with a healthy financial standing are rated at 1 or 2 points, 3 points indicate the boundary between good and bad financial position, 4 points expressing a bad financial situation and 5 points poses the risk of insolvency or the threat of bankruptcy (Kubenka, 2016). The average result for financial stability is calculated on the basis of the points obtained from the first two components

of the model, and the average results for profitability based on the calculated points of the third and fourth components (Kozjak, 2014). The final result is obtained as the arithmetic mean of the previously calculated average values of the indicators expressed in points as shown in Table 2.

Table 2. Evaluation of the components of the Quick-Test

Indikatori	1 Excelent	2 Very good	3 Good	4 Bad	5 Risk of Insolvency
X_1	>30%	>20%	>10%	<10%	Negative
X_2	< 3 years	< 5 years	< 10 years	< 12 years	>30 years
$(X_1+X_2)/2$ Finanancial stability					
X_3	>15%	>12%	>8%	<8%	negative
X_4	>10%	>8%	>5%	<5%	Negative
$(X_3+X_4)/2$ Total performance and profitability					
$[(X_1+X_2)/2 + (X_3+X_4)/2]/2$ Total rating					

Source: Kraličeк, http://www.kralicek.at/pdf/qr_druck.pdf, customized by the authors

The indicators of the Kralicek Quick Test are calculated according to the following formulas (Alihodzic, 2013):

- X1 (Own financing coefficient) is calculated as the ratio of equity / total liabilities and shows the share of capital in total sources of financing. The recommended value of this indicator is 10% or more;

- X2 (Time of debt repayment in years) is calculated as total liabilities-cash / (net profit + amortization) and shows the time of repayment of debt. It is recommended that the value of this indicator be 12 years and less;

- X3 is calculated as the ratio of EBIT / total assets and shows the profitability of total assets in relation to operating profit. The recommended value of this indicator is 8% or more;

- X4 is calculated as ratio (net profit + amortization) /bussines earnings and shows the share of cash flow in operating income. The recommended value is 5% or higher.

Growth equilibrium model according to (Walsh, 2003) is used to identify the growth rate that a company can withstand the operational cash flow. This means that the cash flow is in balance if it does not lead to surplus or deficit as a result of growth. The balance of Walsh is marked with E and emphasizes that when E = 1 the cash flow is neutral, the value E> 1 indicates a positive cash flow and E <1 to a negative cash flow. The company is in a position of balanced growth at the value E = 1. The equilibrium indicator E is calculated according to the following formula:

$$E = \frac{R}{G * T} = \frac{RE/S}{[(S_1/S_0) - 1] * CA/S} \quad (3)$$

In this formula, symbols and expressions have the following meanings:

E- Equilibrium growth coefficient;

R- Relationship Retained Earnings (RE) and Sales (S): RE / S;

G- Growth rate: (S1 / S0) -1;

S1- Sales of the current year;

S0- Sales previous year;

T- Relationship Current Assets (CA) and Sales (S): CA / S

Results and discussion

This section presents the results showing the financial position of the company using the Z'-score model, the financial stability and profitability indicators of the Kralicek Quick Test Model and the Balanced Growth model. All obtained results are calculated by the author. Due to a more transparent presentation of the results of the companies PKB Corporation a.d., Padinska Skela will be marked with the letter (A), Backa a.d., Sivac letter (B) and Plantaža doo, Velika Drenova letter (C).

The analyzed period of three years is conditioned by the official change in the form of the financial statements (starting from 2014) but sufficiently representative of the financial position based on the change in the analyzed Z'-score values. These changes as well as the financial position of the companies in the sample are shown in Table 3.

Table 3. The values of Z'-score and Zones of Discrimination

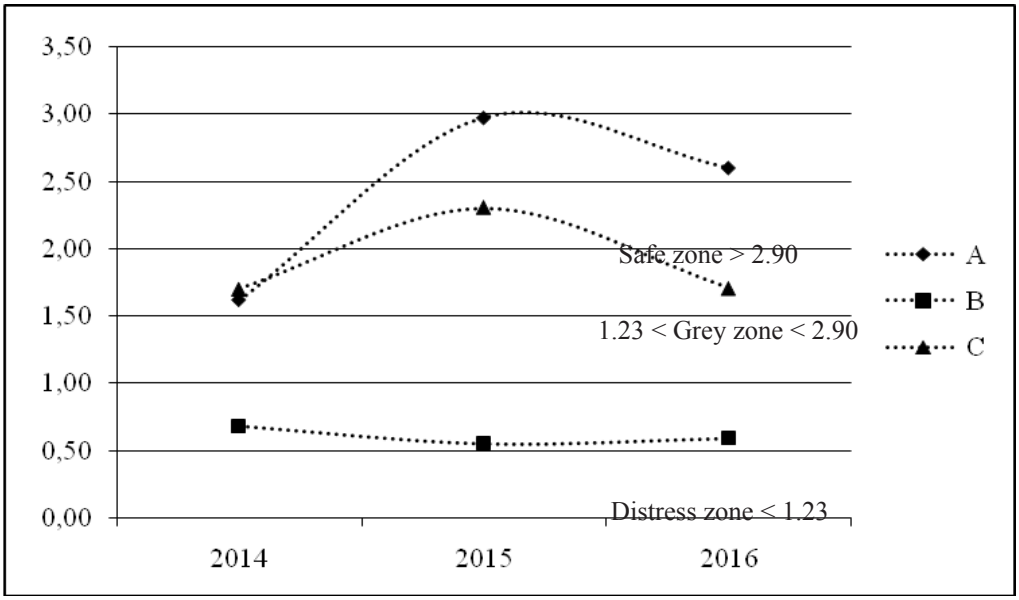
Year	Company					
	A		B		C	
	Z'-score	**Zone**	**Z'-score**	**Zone**	**Z'-score**	**Zone**
2014	1.62	Grey	0.69	Distress	1.70	Grey
2015	2.97	Safe	0.56	Distress	2.30	Grey
2016	2.60	Grey	0.60	Distress	1.71	Grey
Averige	A		B		C	
Z'-score	2.40		0.62		1.90	
Zone	Grey		Distress		Grey	

The shown Z'-score changes indicate the financial position of the companies in the analyzed period and whether it is repaired or worsened. Based on the analysis of these changes, their future financial position can be predicted in relation to the threat of bankruptcy.

The increase in Z's score from 1.62 in 2014 to 2.97 in 2015 suggests that in 2015 there was an improvement in the financial position compared to 2014 and that the company went out of the gray zone into a safe zone of business. In the next 2016, the Z'-score will decrease from 2.97 in 2015 to 2.60 in 2016. The worsening of A's financial position in 2016 coincides with the return of A from safe zone to the gray business zone. The

average Z'-score for the analyzed period is 2.40 which makes this company position in the gray zone. This position does not mean an automatic and a bad position. The location in the gray zone means that it is possible to make certain changes in the business to the company in a safe zone, which was shown in 2015 compared to 2014. Company B is continuously throughout the analyzed period in the Distress zone. The Z'-score value is constantly less than 1.23, indicating a very bad financial position and a high risk of bankruptcy. The average value of the Z'-score for the analyzed period is 0.62 which puts this company in a distress zone of business without great looks for a significant improvement in its financial position. Score C's score C shows that this company improved its position in 2015 compared to 2014 as the Z'-score in 2015 rose from 1.70 in 2014 to 2.30 in 2015. This improvement in the financial position did not continue in 2016 There has been deterioration and return to level 2014, which is certainly not an encouraging move. Throughout the analyzed period, this company is positioned in the gray zone with already introduced changes within the zone of its operations. The average Z'-score for the analyzed period is 1.90 which keeps this company in the gray business zone. The analyzed changes are shown on Grapf 1.

Figure 1. Dynamics of Z'-score companies in the sample



Using the analysis of the indicators of the Kralicek`s Quick test, the financial stability and profitability of companies A was analyzed; B; and C and their overall financial position on the basis of the examination of the action are indicated by two segments. U Table 4; Figures 5 and 6 show the results of the analysis using this model. For a more transparent table, we introduced the following symbols: E (Exscellent), VG (Very Good), G (Good), B (Bad) and RI (Risk of Insolvency).

Table 4: Calculation of the Klaricek`s Queen's Indicator for company A

Indicator	A		
	2014	**2015**	**2016**
X1	0.69	0.82	0.80
X2	11.71	-15.71	-21.69
X3	0.01	-0.01	0.00
X4	0.12	-0.10	-0.08
	Point		
$P1_{X1}$	1	1	1
$P2_{X2}$	3	5	5
Averige ($P1_{X1+}$ $P2_{X2}$)/2	2	3	3
Financial stability	VG	G	G
$P3_{X3}$	4	5	5
$P4_{X4}$	3	5	5
Averige ($P3_{X3+}$ $P4_{X4}$)/2	3.5	5	5
Profitability	G	RI	RI
Score	2.75	4	4
Pozition	G	B	B

The coefficient of own financing of company A in the analyzed period shows that from the standpoint of own financing this company does not have a risk of insolvency. This indicator (X1) has been excellent in all three years analyzed. In relation to the recommended values (≤ 12), the indicator (X2), only 2014 was within the limits of the recommendation. The negative sign is due to the higher value of the loss (negative business result) than the amount of depreciation. Values obtained outside the recommended values indicate solvency problems. The average value of these two indicators is the basis for assessing the financial stability of the company (P1x1 + P2x2) / 2. Based on the values obtained in the analyzed period, it can be concluded that this company has good financial stability but the negative business result in the last two years of the analyzed period is higher than the depreciation. If this trend continues, the company will be exposed to problems of insolvency. Profitability ratios (X3) is extremely low or negative. In all years of the analyzed period, the profitability rate was less than the recommended (≥ 8%). The share of cash flow in business revenues (X4) was positive in 2014 and amounted to 12%, which is more than the recommended size (≥ 5%). In other years, in 2015 and 2016 the value of this indicator was negative because the amount of the negative net result was higher than the amount of depreciation. In the last two years of the analyzed period, the company is at risk of insolvency. The final rating of company A in 2014 was 2.75 points (good), in 2015 it was 4 points (bad) and in 2016 also 4 points (bad). The company is in poor financial condition.

Table 5. Calculation of the Klaricek`s Quick Test for company B

Indicator	B		
	2014	**2015**	**2016**
X1	0.50	0.55	0.52
X2	-8.80	-0.67	-20.94
X3	0.00	-0.04	-0.02
X4	-0.39	-0.82	-0.16
	Point		
$P1_{X1}$	1	1	1
$P2_{X2}$	5	5	5
Averige ($P1_{X1+}$ $P2_{X2}$)/2	3	3	3
Financial stability	G	G	G
$P3_{X3}$	4	5	5
$P4_{X4}$	5	5	5
Averige ($P3_{X3+}$ $P4_{X4}$)/2	4.5	5	5
Profitability	RI	RI	RI
Score	3.75	4	4
Pozition	B	B	B

Company B does not have a risk of insolvency from the home of the self-financing coefficient. This estimate is based on the value of the self-financing coefficients in the analyzed period. In all years of the analyzed period the coefficients were higher than the recommended value (≥ 10). The repayment period with negative signage indicates that the company is not able to repay due to the negative cash flow. The financial position assessed as good should however be accepted conditionally, primarily as a ratio of own sources of financing and total liabilities, however, a negligible amount of cash (except for 2015) and a negative cash flow nevertheless indicate a risk of insolvency. In 2014, the profitability rate was rated 4 points (bad) because it was less than the recommended (≥ 8%), while in 2015 and 2016, a score of 5 points (risk of insolvency) was obtained. The cash flow in the operating income over the three years of the analyzed period was with a negative sign, which was estimated at 5 points (risk of insolvency). The final status of the company the company's quick test in all three years is bad because the number of points ranges from 3.75 in 2014 to 4 in 2015 and 2016. The financial position of this company is poor.

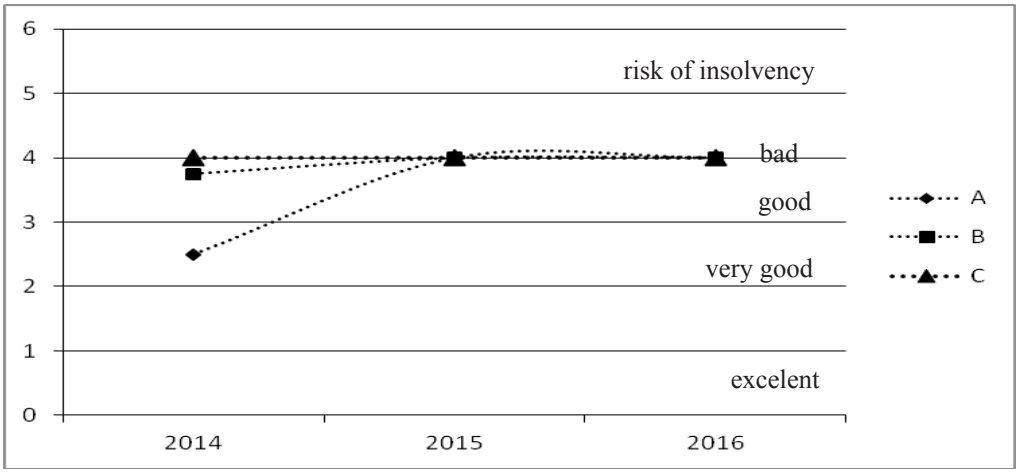
Table 6. Calculation of the Klaricek`s Quick Test for Company C

Indicator	C		
	2014	**2015**	**2016**
X1	0.81	0.86	0.83
X2	-29.06	-1.10	-4.24
X3	-0.05	-0.07	-0.09
X4	-0.13	-2.46	-0.88

Indicator	C		
	2014	2015	2016
	Point		
$P1_{X1}$	1	1	1
$P2_{X2}$	5	5	5
Averige ($P1_{X1+}$ $P2_{X2}$)/2	3	3	3
Financial stability	G	G	G
$P3_{X3}$	5	5	5
$P4_{X4}$	5	5	5
Averige ($P3_{X3+}$ $P4_{X4}$)/2	5	5	5
Profitability	RI	RI	RI
Score	4	4	4
Pozition	B	B	B

Coefficients of C company's financing in the analyzed receive 1 point (excelent). The debt repayment period is in all years of analysis with a negative sign, which means that the company is unable to repay the debts it has. These indicators have received 5 points (risk of insolvency). Financial stability is rated as good because the average value of the indicators X1 and X2 is 3 points. The structure of the sources of financing is a good but negative cash flow, however, indicates long-term insolvency risks, so that indicator X1 and its impact on a good financial stability assessment (3 points) must be taken with reserve. Coefficients that indicate profitability are negative throughout the analyzed period and are estimated at 5 points (risk of insolvency). The share of cash flow in operating income is also negative throughout the analyzed period and ranges from -0.13 in 2014 to -2.46 in 2015 to -0.88 in 2016. The cause of these (negative) values is the negative cash flow. The perfect score for this company is 4 point (bad) in all years of the analyzed period. The financial position of this company is bad.

Figure 2. Dynamics of Kralicek's Quick test companies in the sample



Further financial analysis was carried out using a balanced growth model. The analysis of this model indicates the extent to which the analyzed companies are able to generate cash flows in order to finance working capital in the situation of increased demand for working capital in the ongoing business and in the growth phase. The calculation of the results was based on the balance sheet and profit and loss accounts of the analyzed companies and are presented in Tables 7, 8 and 9.

Table 7. Components of a balanced growth model for company A

E-components	2014	2015	2016
R= Retained Earnings/sales	0.44	0.48	0.21
G= ($Sales_1$/$Sales_2$)-1	-0.09	-0.11	0.00
T= Current Assets/Sales	0.67	0.75	0.81
E= R/G*T	-7.01	-5.85	0.00

Company A has a noticeable negative growth rate in 2014 and 2015, while in 2016 it has a minimal growth registered only in the third decimal (0.001). Growth rates are negative due to a decrease in revenues in 2014 relative to 2015 and 2015 compared to 2016. Craft funds have growth under the pressure of negative growth rates leading to ever-increasing borrowing, while retained earnings are not enough to finance growth as an internal source of funding. As a result, borrowed funding sources are growing. The negative value E, as well as the value 0 (zero), point to the problem of unbalanced growth and inadequate financing of this growth.

Table 8. Components of balanced growth model for company B

E-components	2014	2015	2016
R= Retained Earnings/sales	0.00	3.69	0.00
G= ($Sales_1$/$Sales_2$)-1	-0.15	-0.71	0.33
T= Current Assets/Sales	4.57	1.00	0.71
E= R/G*T	0.00	-5.16	0.00

Company B has a marked growth rate measured (G) in 2014 and 2015, and in 2016 it has a positive growth rate of 33%. Own sources of financing from retained earnings are very weak and in 2014 and 2016 they do not. In 2015, the self-financing rate of retained earnings is 3.69 but insufficient to finance growth. As a result, the growth of working capital in 2014 (4.57) was financed by a sharp increase in short-term loans, while internal sources of financing were of low capacity to finance growth. The value of E, which was 0 (zero) in 2016 and 2016, and in 2015 it was negative indicates serious financing problems as well as the lack of balanced growth.

Table 9. Components of balanced growth model for company C

E-components	2014	2015	2016
R= Retained Earnings/sales	0.11	0.00	0.00
G= ($Sales_1$/$Sales_0$) -1	-0.17	-0.09	-0.20
T= Current Assets/Sales	2.06	0.97	0.75
E= R/G*T	-0.31	0.00	0.00

Company C has negative growth rates throughout the analyzed period. The rate of self-financing of growth from retained earnings is 0 (zero) in 2015 and 2016, ie retained earnings in those years are not recorded. In 2014, the growth in business activities was financed from retained earnings at 11%. The decline in working capital was caused primarily by the lack of own sources of financing for growth and the fall in short-term sources of financing. The negative value of E in 2014 as a value of 0 (zero) in 2015 and 2016 indicates that this company does not have a balanced growth.

Conclusions

On the road to joining and achieving full membership in the European Union (EU), Serbia must pass the transition process. In the transition process, a significant phase is privatization, which entails very profound changes in the economic system, and therefore in agriculture as an important branch of the Serbian economy. This process, according to many opinions and researches, did not meet the general expectations nor gave the expected result. Privatization in agriculture and the food industry took place without a clear plan and direction. In this process, the state obviously had a Laissez-faire approach that allowed privatization almost to the creation of a monopoly (dairy industry). The model of privatization by auction in most cases and the tender sale instead of recapitalization and retaining the core business did not make any positive progress. The companies remaining for privatization (on the website of the Ministry of Economy there are ten) do not make a significant financial or development base, with the exception of PKB Corporation, which is the only remaining agricultural conglomerate with development potential. The analysis of the financial position of the three companies to be privatized generally shows that their financial position is not good. Altman's test shows that company A and company C are in the gray zone, which means they are not completely resilient to bankruptcy while company B is in a distress zone, which has been shown by its status. Kralicek's Quick test showed that company A had a good financial position in 2014, but in 2015 and 2016 this position worsened to the category bad. The balanced growth factor for company A is negative only in 2016, where the value of this coefficient is negligible above zero, but far from the value of 1 which is a value that shows a balanced growth. According to Altman's test, company B is constantly in a distress zone, as confirmed by the Kralicek Quick Test, according to which this company is classified in the category of risk of insolvency. The balanced growth coefficient is far from the value of 1 (one), which points to the problem of growth imbalance. Company C is, according to the Altman test, constantly

in the gray zone, which shows that it is not resilient to bankruptcy. The Kralicek Quick Test showed that this company is constantly in the category of bad and that it is close to the category of risk of insolvency. This company, as in previous cases, does not have a balanced growth. The overall assessment is that all three companies are not resilient to bankruptcy, they are in a poor financial position with an unbalanced growth. Privatization of these companies will be a problem, given that significant additional funds are needed for their consolidation, balancing the night flows and investing in development. PKB Corporation has a better chance of privatizing more because of the potential and relatively stable market, and less because of its financial position.

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Conflict of interests

The authors declare no conflict of interest.

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THE EFFECT OF THE AGRARIAN REFORM ON THE DEVELOPMENT OF CULTURAL ACTIVITIES IN THE REPUBLIC OF CUBA

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ABSTRACT

Cuban socialism's efforts to resolve the "agrarian issue" determined the strategies currently in force and their immediate goals. As part of this process, we examine six aspects that characterize the Island's sociopolitical development: the structure of land ownership, land usage, the agrarian organization, the technological model, the agrarian economy, and the development of rural society. Many challenges remain to shaping comprehensive and coherent economic strategies that encourage sustainable economic growth, facilitate Cuba's international economic integration, and contribute to the efficiency and competitiveness of Cuba's economy while simultaneously safeguarding the revolution's gains in social inclusion and equity. The research is supported by knowledge and results from scientific and professional literature, that is, the findings and scientific results of numerous professional authors who have studied the issues of this work in their books and articles.

Introduction

After the insurrectional triumph against the Batista dictatorship in 1959, the Revolution started as a profound transformation of Cuban society, first political, then social and soon after agrarian. In fact, the many insurrectional political programs were committed to changing the conditions of the Cuban countryside and more precisely to an land reform, as contained in the Cuban radical thought and in the constitutional mandate of 1940. The most prominent of these programs is Fidel Castro's famous Statement of Defense (Castro, 1966).

The Cuban agrarian process has therefore been an inseparable part of the history of the Cuban Revolution and one of its cornerstones. Studying this process means referring to a 50-year history, a daring act that escapes the purpose of this essay and for which we have neither the time nor the space required.

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The socialist strategies implemented at that time gave rise to the peculiar agrarian issue, characterized in part by the high level of nationalization of agricultural activities, the low productivity of labor and means, as well as food insecurity. The solution to this "agrarian issue" of Cuban socialism determines the agrarian strategies in place and their immediate goals. We shall examine below some of the topics of its path.

Materials and methods

In this research, we specifically deal with Cuban socialism's efforts to resolve the "agrarian issue" and manage numerous challenges of modern agrarian reform in the Republic of Cuba. The research is supported by knowledge and results from scientific and professional literature, that is, the findings and scientific results of numerous professional authors who have studied the issues of this work in their books and articles. During the research, the following principles of scientific knowledge were used: objectivity, systematicity, reliability, scientific accuracy and precision. On the basis of the aim of this research, the combination of chosen methods enable the quality realization of this scientific paper.

In this research methods of analysis were conducted in the classification of complex categories, methods of specialization and after synthesis elaboration, different conclusions were formed. The techniques of classifying different data through literature review, as well as the method of description and generalization, have been applied. Generalization as a synthetic scientific method by which it is learned generally on the basis of the individual was conducted during this research. Using the method of description, we present the results that were obtained by looking at the effects of the initiated process of agrarian reform and its effect on culltural system.

Results

In this paper authors aim to analyze the transitional socio-economic effects to date and the obstacles Cuban society have faced, to identify the social actors involved, and to reveal, along with the new cooperatives' potential for solving Cuba's historic agrarian problems, the continuing restraints on realizing that potential. This research paper represents an attempt to determine the capacity of Cuban economic system to adapt to challenges of modern agrarial and social reforms.

This paper aims to study the changes that the Cuban economy has undergone in recent years following the rise of Raúl Castro to the position of President of Cuba. The hypothesis is that in its current implementation of economic market reforms, Cuba has sought to accelerate its path to rejoining the global market, portraying itself as an economy highly focused on inflation control, the expansion of microcredit (an instrument to deal with poverty), and tax collection by the State, as its development strategy. In this way, the Cuban economy is positioning itself as a potential pole to attract foreign investment. To achieve the objective and hypothesis described here, this paper draws on an empirical–analytical approach to interpret the effects caused by structural reforms in major economic sectors.

Structure of land ownership and tenure

As Antonio Garcia used to teach, the characteristic of the domination of large landed estates is not only the high concentration of land in the hands of a few owners or occupants, but also the consequences of relations of exploitation, subordination and exclusion stemming from it, and the corresponding cultural expression, that which he called "the constellation of landed estates" (See: Valdés Paz, 1997, p. 45). The Cuban historical experience could only but corroborate this view. Thus we can see that in the 1950s, a structure of land ownership characterized by land concentration showed that 57% of the land were in the hands of 3% of owners, while 78.5% (around 126,000 occupants with less than 5 hectares of land) were held by only 15%; and 40% of them as tenants, subtenants, partners or hold-over tenants.

In fact, the reform of the land ownership structure was the first major structural change implemented by the Revolution in 1959, and since then one of the socioeconomic structures subjected to the greater number of reforms. Since 1959, four reforms have been introduced to the land ownership structure, which can be summarized as follows:

1) First Agrarian Reform Law of May 1959, which eradicated landed estates and foreign ownership of rustic property; eliminated of all forms of non-proprietary ownership; and gave ownership of the land to those who worked it, thus benefiting over 100,000 peasants. Its enforcement, under conditions of severe internal and external struggle, gave rise to a nationalized agricultural sector managed by the State, which comprised 33% of the country's land.

2) Second Agrarian Reform Law, which was enacted in 1963, once the socialist character of the Revolution had been defined in the context of the political and class struggle of the time. This second Law provided for the automatic nationalization of all properties or buildings with more than 67 hectares. With it, the state agricultural sector gained ownership of 66% of the land, becoming the basis of the socialist development of Cuban agriculture.

3) Evolution of the 1960s, 1970s and 1980s. from the second half of the 1960s there was a gradual transfer of land from the private sector to the state sector, for reasons of voluntary sales by peasants or purchase for public service, in support of state development plans. The agrarian crisis which began in the 1990s (shortages, decapitalization, collapse of the technological model, lack of agricultural workforce, etc.) brought about to the urgent need to redistribute nationalized land in favor of cooperatives and the peasant sector. This led to a privatization of the ownership structure, reducing its share from 80% to 40% of the land.

4) Fourth Agrarian Reform initiated in 2008. The difficult conditions for agricultural recovery in state or recently privatized lands gave rise to a growing stock of idle lands, raising the urgent need for their redistribution under usufruct conditions to new peasants, traditional peasants and cooperatives with workforce availability. The trend shown by the evolution of the land ownership structure in the country was the historical condition for the nationalization of rural property, for subsequent redistribution as private, peasant or cooperative ownership.

Organization of agricultural production

The successive land reforms and agricultural development strategies of each period have influenced the evolution of the Cuban agrarian organization, on behalf of novel forms of organization such as state enterprises and cooperatives. A more detailed examination by sector could be illustrative.

Producers

Peasant producers with areas of 24 hectares on average were affirmed as individual or family producers through the first Agrarian Reform. Conventionally, agricultural production is classified as: sugar (cañera) agriculture, non-sugar (no cañera) agriculture and livestock production, with their respective subcategories. In 1963, 880 farms managed 66% of the national lands; and in 1989, 474 state-owned enterprises managed 82% of the lands. Their number decreased in the 1960s and 1970s, stabilized and increased during the cooperativism process fostered during the 1970s and 1980s, and continued to grow as new beneficiaries in the 1990s and 2000s. In fact, records currently indicate the existence of over 300,000 peasants. Various forms of cooperatives have emerged, with different fates, since the 1960s. Cooperatives of peasant origin currently in operation include: a) Agricultural Production Cooperatives (CPA) collectively owned and established during the 1970s and 1980s, which covered as much as 40% of the peasantry and decreased by various causes throughout the 1980s and 1990s; and b) Credit and Services Cooperatives (CCS), a simple form of cooperation in which a number of individual producers gather for certain common purposes. This latter form of cooperation, which was the most successful in the 1990s and the first choice of peasants, tends to increase as a result of the accession of new beneficiary producers. The transfer projected over a million hectares would be distributed as follows: 32% for various crops and vegetables; 18% for forest and fruit; and 50% for cattle farming (Valdés Paz, 2010).

A particular case is that of cooperatives originated among agricultural workers, as a result of the privatization of the 1990s, known as Basic Units of Cooperative Production (UBPC in the Spanish acronym).. The main feature of state agricultural organizations is the large scale and extremely high concentration of resources, as well as the proliferation of second-tier organizations such as unions, business groups, corporations, agribusiness complexes, etc.6 As a result of the particular developments described here, today we have an organizational scenario of agricultural production dominated by self-managed companies, with a higher weight of cooperatives in terms of land and number of producers. This scenario entails new organizational designs for the activities aimed at ensuring production (supply, mechanized services and transportation, etc.) as well as technical-scientific services and product marketing (Valdés Paz, 2010).

Also worth mentioning is the organization of the state directorate in relation to agriculture, which has also evolved over time in terms of both its functional structure and facilities: National Institute of Agrarian Reform (INRA) from 1959 to 1975 (INRA in the Spanish acronym), created in mid-1959 for the implementation of the first

Agrarian Reform Law also played the role of center of the new revolutionary State, performing initially many of the functions and activities that would characterize it later on (see: Valdés Paz, 2010, p. 60).

Ministry of Agriculture (MINAGRI) from 1985 to date, and Ministry of Sugar (MINAZ), which since the 1980s has taken over sugarcane agriculture, as well as their respective territorial delegations. The biggest challenge facing the state directorate of agriculture is to switch from a highly centralized administrative directorate to a decentralized state directorate, the case of the so-called "municipalization" (Valdés Paz, 2010, pp 63-64). This "municipalization" seems to benefit from the following reasons: the organizational scale of all producers is under municipal control; the resources of an agro-ecological production are essentially local; and self-managed producers must measure their management vis-à-vis the market. Future organizational reforms in agriculture will need to overcome the historic contradiction between an essentially territorial activity and a vertical organization; as well as the propensity to base the organizational design on administrative rather than economic criteria; the tendency to base management organization on homogeneous models; and finally define short-term organizational agendas.

Science & Technology

Since the beginning of the land reform process in the 1960s, agricultural development has been accompanied by a parallel development of technical-scientific services for agriculture and by basic and applied agricultural research. Late in that decade and early in the 1970s, a true technical revolution was introduced in the agricultural sector, both in services and in agricultural research, to support the development plans based on a resource-intensive technological model. In fact, large organizations of technical services were established with budget funding (institutes, national centers, central laboratories, etc.), with presence throughout the national territory, territorial units of soil and fertilizer services, and hydraulic, phytosanitary, veterinary and artificial insemination services among others.

This development of technical-scientific resources to support the agricultural sector faced economic constraints of different natures, including: the costs of the activities were fully covered by the budget, with no direct contribution to the costs of the companies; research results had a low level of incorporation into production practices; and their impact on agricultural productivity was insufficient. Indeed, much of the beneficial effect of the technical-scientific resources used as services or inputs served to mitigate the lack of manpower or the decrease in productivity. Much of this development of the scientific-technical structure supported the promotion of a resource-intensive technological model formed by various elements, such as large-scale organization, soil specialization, mechanization, irrigation, use of pesticides, benefit for products, genetic selection, incorporation of new varieties, etc. This conventional model gradually replaced the traditional model prevailing in the 1960s, and more rapidly in the 1970s. This model was in effect until the 1980s, when the economic crisis toppled the intensive model and replaced it by an emerging model, hybrid in nature, composed of elements of the intensive model and other

agroecological models. The need for a model capable of guaranteeing both the economic and ecological sustainability of Cuban agriculture promoted the widespread implementation of agroecological practices, favored by the smaller scale of producers, the model of peasant agriculture as the most sustainable among the forms of production organization, and an incipient ecological culture (Valdés Paz, 2010, p.69).

Agrarian economy

From the 1960s to the mid-1980s, agricultural development played the role of "hard core" of national development strategies. The development policies implemented in agricultural production over the 1970s and 1980s should both ensure a steady increase in exports and meet the growing domestic demand. In this aspect there were important achievements: 1) The national agricultural area reached 62% of the total area, 13% higher than in 1957, and the crop area was 2.3 times larger than that existing in the 1950s; 2) The recovery of the sugar agriculture started in the second half of the 1960s would ensure harvests between 7 and 8 million tons by the end of the 1980s; 3) Diversification and the expansion of non-sugar agriculture enabled ensuring rationed food supply to meet a growing demand. The instruments for this purpose were the Consumers Registry and the so-called portfolio of "Sales control for products". The increase in rice, citrus fruits and tubers production was a particular success (Valdés Paz, 2010, p. 70); 4) In addition, a national level of protein supply was ensured - from meat, milk and eggs - which covered much of the basic needs of the entire population. This entailed a remarkable development and industrialization of cattle, poultry and swine breeding; 5) In 1989, the nutritional status of the population reached the real per capita value of 2,845 kilocalories, 76.5 grams of protein and 46.5 grams of fat; 6) Sugar and non-sugar agriculture succeeded in constantly increasing sugar, tobacco and citrus exports.

Investments in agriculture

These achievements were underpinned by an accelerated process of modernization through productive investment, equipment and development of infrastructure in all agricultural activities. Between 1960 and 1970, the rate of investment in the sector accounted for 25% of national GDP. This process required a remarkable and successful effort in personnel development, workforce training, and massive training of secondary and higher education technicians. The crisis of the 1990s produced, among other effects, an accelerated decapitalization of agriculture of not less than 50% of the basic means, and a decline in productive investment. This affected particularly the level of equipment - for lack of replacement or obsolescence - and the preservation of resources and facilities. This is one of the restrictive conditions that agriculture will have to face to move forward in its recovery.

Marketing of agricultural production

The marketing of agricultural production began to be organized in the 1960s as a supply and distribution (national and territorial) state system. This system was responsible for the purchase, transport, processing and wholesale delivery of agricultural production to the industry and for domestic consumption. Livestock production was provided

directly by the food industry. This system based on the allocation of funds required for performing its functions and on the absolute weight of the state sector in agricultural production began to experience lower levels of efficiency until it went into crisis in the 1990s. Its recovery was prevented by conditions contrary to those that originated it. Incidentally, the reemergence in the 1990s of the free market, new brokers and the predominance of private production imposed a more complex and participatory conception of agricultural marketing, but not without bringing with them tensions and variations in the central planning, in the guarantee of social consumption and in the rationing portfolio, which is still pending normalization.

Current challenges in Cuban agriculture

The technological and productive achievements of the Cuban agrarian economy in the first three decades left unresolved the problems of its inefficiency, seen in the low productivity of means and labor, as well as in the growing need for public subsidies in virtually all its sectors. This showed that the Cuban agricultural model was becoming increasingly unfeasible, both economically and ecologically.

The main causes of this trend were both intrinsic to the agricultural model implemented in the 1960s (nationalization, centralization, inadequate incentive mechanism, insufficient money-commodity relations, etc.) and external, as in the case of the Economy Management and Planning System (SDPE in the Spanish acronym) prevailing in each period. Under current conditions, this new system should incorporate, among other things: greater autonomy of the business sector, planning complemented by the market and a tough financial regime. The agricultural model should adjust to this SDPE or "management model". Precisely, this new model will be responsible for recovering the country's agro-exporting capacity and the food security of its population. Among the difficulties facing the implementation of a new model is the absence of a direct workforce in the agricultural sector, as well as the lack of resources by most companies. When this model is defined in all its components, policies to overcome these difficulties will need to be implemented.

Rural development

Overcoming the issues facing the Cuban rural society was a top priority of the revolutionary program and an inseparable part of the national development strategy. These conditions referred not only to the structure of land ownership and tenure and other means of agricultural production that supported the class structure and to the relations of exploitation, oppression and exclusion that prevailed in the pre-revolutionary rural society, but also to the absolute backwardness of rural society in relation to urban society (Harper, 1970, p. 34).

Overcoming these conditions required, first of all, implementing successive land reforms that radically suppressed the Cuban dominant classes, landowners and the agrarian bourgeoisie, as well as the administrations of foreign companies; at the same time, the agricultural proletariat and peasantry proliferated on a large scale. In turn,

the agrarian transformations in general gave rise to a new occupational structure in the Cuban countryside, the main profiles of which are: individual producers, cooperative producers, manual workers, blue collar workers, technicians, clerical workers, managers, artisans and independent workers.

Despite the advances achieved in leveling the urban and rural areas, over time the rural population has show a downward trend in both absolute and relative terms, increasingly affecting the reproduction of the agricultural workforce. In fact, the workforce had shown a downward trend in almost all production sectors until recent years, when new incentive and land distribution policies promoted the return of direct producers. Rural development favored in particular the incorporation of women in social work with greater independence and as protagonists, as well as of young workers, mostly as skilled labor. Finally, we should mention that a resource-extensive and a resource-intensive agrarian exploitation has left its mark in the rural environment by affecting it with greater soil degradation, water pollution, loss of biodiversity, environmental pollution, etc.

Culture as a Means of Enhancing Growth of the Agriculture

Previous attempts to distinguish the Cuban ideological variant from that developed in the Soviet Union have had recourse to the notion of "Martían Marxism", which one of the leading comandantes, Ernesto "Che" Guevara de la Serna, is credited with having introduced into the constitution. This implies a Marxism tempered by the insistence of the nineteenth century Cuban poet and revolutionary, José Martí, on resistance to US imperialism being mounted across Latin America. Yet, while the ideas of Martí indisputably influenced the broader ideology of the Cuban Revolution from the outset and the reconciliation of Martí and Marx would come to be regarded as alien to the dogmatism that had led to the installation of socialist realism in Europe, documents pertaining to post-revolutionary cultural policy refer not to Martían Marxism but to Marxist humanism. When detailing the humanistic character of Cuban Marxism, the work of Argentinean writer and politician, Aníbal Ponce, is of particular relevance. In 1935, Ponce undertook a detailed study of the humanism that had arisen in the capitalist world to conclude that class society made the idea of a universal culture impossible. By contrast, Ponce proposed that culture could be understood as a form of social consciousness that encompassed individual consciousness, which could form the basis of a proletarian form of humanism.

Considering the instrumentalisation of culture to the betterment of society, Fidel Castro would elaborate, with ample historical justification, "I don't think there has ever existed a society in which all the manifestations of culture have not been at the service of some cause or concept'. In the specific case of Cuba, he believed, 'Our duty is to see that the whole is at the service of the kind of man we wish to create. […] I believe that the content of any artistic work of any kind – its very quality for its own sake, without its necessarily having to carry a message – can give rise to a beneficial and noble feeling in the human being" (Lockwood, 1967, p. 11). In emphasising the inherent properties of artworks, Fidel successfully exempted them from the didactic aims that were being enforced in orthodox Marxist circles. At the same time, he veered close

to a Kantian understanding of artistic enjoyment and the contribution this experience could make to physical and mental well-being, the idealistic roots of which served to further distance him from orthodox materialism. But it is important to note here that, while the pleasure attributed to aesthetic encounters would become closely linked to individualism under bourgeois humanist regimes, reaching its zenith in the Romantic era, in post-revolutionary Cuba, the enjoyment of art was made available to all as part of the collective process of reshaping individual and social consciousness.

As explored in greater detail below, this implied not only (passive) appreciation of but also (active) engagement in creative practice as a necessary step towards building a better world foreshadowed by human desire. But this did not mean that popular enjoyment of art should be confined to mediocre forms. In this regard, a second highly instructive point to be taken from The German Ideology is Marx and Engels's rejection of the Romantic idea of creative activity being confined to unique individuals working within constrained disciplines, which is taken to rely upon the suppression of artistic talent in the broader populace.

The revolutionary idea emerges that the intellectual capacity of the huge breadth of organic intellectuals needs to be encouraged. This precedent for democratizing culture would find easy accommodation with Cuban aims. And, while Cuban conceptions of the proletariat would tend towards the peasantry, rather than the industrial working class, it was generally assumed that access to education and culture would play a vital part in lifting the populace from underdevelopment as part of the desired shift to classless society.

At the same time, while capitalism has consistently been perceived to alienate artistic creation from both its producers and the society in which it is made – thereby diminishing its possible contribution to the betterment of humanity and the achievement of social justice – the Cuban Government continues to argue that socialism recognises the real value of art and literature, giving freedom and material stability to artists while revindicating a social role for culture in ways that will be considered here.

Culture as a form of social production

While a number of artists, writers and thinkers maintained some kind of praxis under the pre-revolutionary regime of General Fulgencio Batista, this was carried out in an often samizdat fashion that risked punitive measures. Before 1959, Cuban artists were dependent upon the whims of businessmen who commissioned work on the basis of private sales. After 1959, the market was generally rejected as a planning device, and, within the cultural field, it could be claimed that Socialism is the first social regime that emancipates culture from the oppression of money, which means the artist can create not to satisfy the depraved tastes of a handful of gluttons but for the great mass of the people.

Cultural producers were declared free from economic insecurity, allowing them to pursue their art instead of having to rely on sales or earn a living from work other than their creative practice. To this end, it was decided that creative practitioners should have a fixed income equal to other workers. In January 1961, a National Council of Culture (CNC) was established as the central organisation responsible for interpreting

and implementing the cultural policy of the revolutionary government. At the First National Congress of Writers and Artists in August 1961, the CNC Director of Culture, Vincentina Antuña, alluded to numerous grants being awarded to young artists and writers. At the same event, the poet, Roberto Fernández Retamar, read out the founding statutes of the National Cuban Union of Writers and Artists (UNEAC) and announced the creation of a Literary and Artistic Fund under the new union. Cautioning that this fund should not be envisaged as a total solution to the material problems facing artists and writers, he articulated the hope that intellectual work would shortly be considered akin to manual work, making it worthy of remuneration, which, in turn, would bring about a commitment to the profession of arts and letters.

According to a CNC publication, 1969 saw the implementation of a plan to pay artists a salary and cover the cost of their materials, as part of a mutual agreement between the artist and the state, and the Cuban writer, Ambrosio Fornet, asserts that intellectuals 'were able to create with total autonomy thanks to autonomous institutions and a type of patronage – state subsidy – free from the demands of bureaucracy like that of servitude to the market'. (Fornet, 2004, p. 12). As a consequence of this approach, artists graduating during the 1960s and beyond had a guaranteed place in society and (were) able to devote themselves to creative activities without any concerns or difficulties. In return, many artists repaid the state through their work as teachers within the national art schools or as designers of mass-produced books and periodicals. Artworks shed their commodity character, serving as a means of dissemination (through non-commercial posters and publications) or forming part of the national collection, with the state acting as both sponsor and collector.

In 1961, the process of guaranteeing artists and writers a viable income brought about reorganisation of the Copyrights Institute, which would eventually see a decision being taken to revise copyright laws. Prior to the Revolution, laws governing intellectual property – drawn up on January 10th 1879 and amended in the 1930s – had covered scientific, literary, artistic, dramatic and musical works. On April 29th 1967, while inaugurating projects by female scholarship students at Guane, in Pinar del Rio province, Fidel contemplated the private property claims encompassing intellectual work that had historically prevented the people from accessing useful information. Considering that the country's cultural development could be accelerated by reprinting works from around the world – from North American technical manuals to works of universal literature – he proclaimed the abolition of copyright. At the same time, he renounced Cuba's right to any intellectual property accrued within its borders, on the understanding that provision would be made for those who relied for their survival on royalties from creative work. In October of the same year, this theme was taken up at the preparatory seminar for the Cultural Congress of Havana, which would be staged in January 1968. Convinced of the national and international significance of this stance, the artists and writers present at the seminar willingly relinquished the commercial rights to their work, in return for their recognition within society and the value inherent in the creative act. Accordingly, a resolution was issued on the subject of artists' rights, signalling Cuba's intention to elevate its cultural condition by accessing the world's knowledge.

At a stroke, the floodgates were open for the liberal reproduction of classic works of literature, sociology, anthropology and economy, freely disseminated around the island in Spanish-language editions of multiple thousands. At the same time, the renunciation of copyright on Cuban works reinforced the material reliance of writers upon the state. It has been observed, however, that 'the importance of such a change can be easily overestimated abroad, where royalties are an essential part of the writer's incentive system. In Cuba, even after the new publishing structures eliminated the need for self-financed editions, royalties did not represent a significant income for most authors (Casal, 1971, p. 457).

In April 1971, the First National Congress of Education and Culture had its original educational remit extended in a bid to foreclose the international dimension of a prolonged cultural crisis (Sarusky, Mosquera, 1979, p. 40). While the victory of orthodox forces in the wake of the congress would disadvantage Marxist–humanist approaches for the remainder of the decade, the gathering of 1,800 delegates in Havana provided the opportunity to reiterate that 'The Revolution frees art and literature from the inflexible mechanisms of supply and demand that rule over bourgeois society. Art and literature cease to be merchandise, and all possibilities will be offered for aesthetic expression and experimentation in its most diverse manifestations (Santana, 1977, p. 51).

And, while decisions about the receipt of support would be politicised in the wake of the congress, support did not, in itself, imply the imposition of any particular criteria. The dissociation of artists from the market economy is consistent across internal and external documents. At the First Congress of the Cuban Communist Party (PCC) in 1975, reference was made to the system of intellectual and artistic remuneration in place that had enabled the Revolution to eradicate the conditions of penury and humiliation in which art had been maintained. This sentiment was repeated four years later, in a report to UNESCO which described Cuba as the only country in Latin America to accept art as a form of social production.

Conceiving art as a form of social production not only implied freedom from material constraints on the part of artists; it also entailed a contribution to the process of forging society. From a situation characterised by social uselessness, the politicised intellectuals of the era came to regard their intervention in public affairs as not only a possibility but also an obligation. Creativity was recognised as playing an essential part in the struggle for dignity, and Fidel affirmed that, like any other workers, artists and writers would have to create wealth, which, in their case, would be measured in terms of the infinite happiness their work produced (Paz, 1997, p. 27).

In 1975, in recognition of the need to adequately reward creators for the fruits of their labours, the PCC re-established intellectual property rights. Accordingly, Law 14, ratified at the National Assembly of Popular Power in 1977, made provision for the moral recognition and juridical protection of copyright on the basis that this would stimulate the development of artistic, literary and scientific creation; it also detailed the remuneration of intellectual work according to guidelines drawn up by a newly formed Ministry of Culture in dialogue with the social agencies representing cultural producers (Casal, 1971, p. 458).

Significantly, Law 14 prescribed that, following the sale of any work of art, ownership alone would pass to the purchaser, with the author retaining copyright. This contradicts the standard practice of the capitalist world, particularly the USA (with the exception of California), which has historically deprived artists of rights to their work after its sale. In a bid to overcome this in 1971, the art agent, Seth Siegelaub, and the New York City lawyer, Robert Projansky, drew up the Artist's Reserved Rights Transfer and Sale Agreement, a 'model contract, reserving certain rights to the artists, such as entitlement to fifteen per cent of subsequent sales, and the right to borrow the work for exhibitions at certain intervals and to veto loans to exhibitions in which the artist did not want it to be shown (Retamar, 1966, p. 266). In much the same way, the nineteenth century French concept of droit de suite gives artists rights over their work as it passes through the hands of successive owners. On 27 September 2001, the European Union attempted to have directive 2001/84/EC – giving artists continued rights over their work in the event of its resale – accepted across the union, but this legislation remains controversial in the UK.

Consistent with the democratising aims of post-revolutionary cultural policy, the reinstatement of intellectual property rights in Cuba was made subordinate to the broader social need for disseminating cultural works as widely as possible. This means that, where any cultural work is considered necessary for scientific, technical or educational development, a licence can be granted for its reproduction and nationwide distribution, freely and without acrimony over money. Extracts of cultural products may be used without the consent of the author, either with or without remuneration, providing that the author is recognised as the originator of the work. And, while the recent reintroduction of an art market in Cuba starkly illustrates the inequities that quickly result from such a system, the conception of art as a form of social production, and of the artist as an integral member of society, endures (Sarusky, Mosquera, 1979, p. 457).

In summary, then, the recognition of art as a form of social production in post-revolutionary Cuba, with the happiness of man as its ultimate goal, secured for artists both an esteemed place within society and an income that left them free to concentrate on their high-quality productions. In response, creative intellectuals have consistently involved themselves in all aspects of social life. This prompts us to give careful attention to the role of creative intellectuals within our societies, particularly in relation to the ways in which their work is valued within a market economy.

Conclusions

The history of the Cuban agrarian process in its different periods can be characterized as the transition from reforms to an agrarian revolution and, later, from an agrarian revolution to the agrarian reforms underway. In this course, the Cuban Revolution has succeeded in building the foundations of a peculiar socialist agriculture and transforming rural society on a more equitable and participatory basis. Cuba's economic crisis forced the reshaping of agricultural policy in ways that fortified the position of small farmers.

The Agrarian Reform Law of 1959 abolished large-scale landholdings, tenant farming, and sharecropping. It established a maximum limit of 100 caballerías (1,340 hectares or 3,311 acres) for sugar or rice plantations or cattle estates. In accordance with the law, the government subsequently would confiscate the land of 4,423 plantations, distributing approximately one-third of it to peasants who worked on it as tenant farmers or sharecroppers, and establishing state-managed farms and cooperatives with the rest. The former owners were offered compensation, based on the assessed value of the land for tax purposes, and with payment in the form of twenty-year bonds. Inasmuch as some US-owned plantations covered land of 200,000 hectares, the law had a significant effect on the Cuban structure of land ownership and distribution. It provided the foundation for a fundamental transformation in the quality of life of the rural population that endures to this day.

The crisis unleashed in 1990 over Cuban society as a result of the fall of european socialism led to the loss of many of the successes accumulated by the agrarian development driven by the Revolution and aggravated almost all its latent deficiencies. Recovering from these impacts and their consequences are a topic on the agenda yet to be addressed. In it the ability of Cuban agriculture to recover its exports, substitute imports and constantly increase the food security of the population is of particular relevance. The promotion of a new agrarian model that enables overcoming the shortcomings and contradictions of the historical model is the biggest challenge. however, a new agrarian model entails a new national system of economic management and planning. The agrarian issue will remain, as it has always been, an essential part of the Cuban socialist project. The challenges posed by the agrarian issue for the future of Cuban society cannot be met without a socialist alternative oriented to self-government and self-management.

One of the most striking elements of post-revolutionary Cuban public policy is the massive effort that was made to unleash the latent creative potential of an entire population. Inspired by Che Guevara and implemented by the National Council of Culture, the aficionados programme continues to encourage hundreds of thousands of Cubans to engage not only in the passive reception of art but also its active production. This has achieved considerable success in demystifying the production of art and in giving rise to a highly culturally literate population. Herein lies the area of post-revolutionary cultural policy with the most consequence for the capitalist world – that the possibility of eroding the gulf between art and society, long ago abandoned by the historical avant-garde, has been realised to a large extent in Cuba. Any contemporary programme seeking to investigate the social value of culture would do well to consider the ways in which cultural participation can be democratised. More than half a century after the triumph of the Cuban Revolution, it seems clear that further research is needed into the emancipatory connotations of aesthetic engagement.

Conflict of interests

The authors declare no conflict of interest.

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ECONOMIC EFFECTS OF INTEGRATED MARKETING COMMUNICATIONS – THE CASE OF FOOD PRODUCTS

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ABSTRACT

Integrated marketing communications (IMC) present a concept in which various instruments of promotion and media are combined into a consistent message, in order to achieve their synergetic effects observed through better communication and economic indicators.

The aim of this paper is to explore the differences in the economic effects of integrated market communications between consumer segments defined on the basis of the number of integrated marketing communications' instruments related to a particular product to which influences consumers are exposed as well as on the perception of a unique promotional message from all these instruments. The research was related to consumption of chocolate, coffee and bottled water in Serbia and included the total of 1000 respondents.

The results generally show that consumers who are exposed to the integrated marketing communications in relation to a particular food product spend more on buying it and buy it more often.

Introduction

The mode of communication, information collection, product promotion, as well as other changes in the development and changes in the market, cause the need for a new concept of coordination of communication activities of the company (Reinold, Tropp, 2012), which is reflected in the application of the concept of integrated marketing communications (IMC). Although this concept has been present for a long time (since the last decade of the 20th century), its numerous definitions still exist today, depending on the scope that the authors consider to be key to its understanding. For example, Kerr and Patti (2015) state that the concept of IMC is currently at the intermediate level of its development and that further development is based on a deeper understanding of strategic integration, the importance of integration as a manner of organizing business and the ability to demonstrate financial return on investment in IMC. The essence is

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to send a unique and consistent promotional message to consumers through various mutually coordinated promotional and media instruments. The goal of this concept is to achieve communication synergetic effects manifested in a better image and economic synergy effects manifested in more frequent purchases and spending more money on the promoted product. The development of the concept is studied in domestic conditions as well (e.g. Laban, Todorović, 2018) and the need for its implementation is also identified when is, for example, stressed that "marketing program should contain an interactive marketing system that uses one or more media of propaganda in order to influence the market demand" (Mihailović, Simonović, Ćurčić, 2017). The concept of IMC evolved from being just a tool connecting instruments of promotion to being strategic process in connection with brand management (Kitchen, 2005), i.e. part of brand strategy (Madhavaram, Bandrinarayanan, McDonald, 2005). It should replace different instruments, while brand management should be used for initiating and maintaining continuous dialogue with consumers and improving relationships with them (Vargo, Lusch, 2004). Tafesse and Kitchen (2016) state that it is currently the most important to measure the effects of applying IMC, and this paper provides an example of measuring the economic effects of IMC.

The topic of this paper is to research economic effects of IMC in regard to food products – chocolate, coffee and bottled water. These effects included self-reported frequency of purchasing of these products as well as the amount of money spent for it for a month period. The approach to determining whether the consumers were exposed to IMC implemented in this research is innovative. The segmentation of the respondents was carried out based on the number of promotion instruments that they report they were exposed to in regard to certain brand and qualitative analysis of the perception of a unique message from these instruments. After review of the literature, methodology is explained in more details and results and discussion are provided.

Economic effects of integrated marketing communications

In addition to the basic communication objective of implementing the concept of IMC i.e. creating and maintaining a positive and clear image, the goals of applying IMC are also higher profit, higher level of sales, brand market participation, brand strength, awareness of it, customer satisfaction and level of loyalty to the brand etc., presenting economic goals or elements contributing in achieving these goals (Vantamay, 2011). Also, Belch and Belch (2009) indicate that the funds invested in IMC should have measurable results, such as the increase in sales volumes or the market share of the brand. Schultz, Cole and Bailey (2004) give a wider picture of the economic indicators of the success of the concept by defining them as return on investment, return on brand investments, return on investment in the consumer, and return on investment at the contact point.

Taylor (2010) suggests that, in the context of the need for additional research on the measurement of the effects of IMC, more attention needs to be paid to the return on investment. Although the above-mentioned indicator is highlighted by the author, he does not exclude the possibility of using others, nor ignores remarks of Ambler and

Roberts (2008) when it comes to measuring the performance of marketing through: conventional return on investments, discounted cash flows and returns per consumer.

In this paper the effects of IMC from the consumers' perspective are analyzed through the frequency of purchase and the amount of money for purchasing. Following hypotheses were set:

H_1: Consumers who perceive marketing communications in relation to a particular product as an integrated, statistically significantly differ from other consumers in a manner that they spend a higher amount of money for the purchase of that product.

H_2: Consumers who perceive marketing communications in relation to a particular product as an integrated, statistically significantly differ from other consumers in a manner that they purchase that product more frequently.

Methodology

The convenience sample of 1000 respondents from Serbia consists of 52.3% of women and 47.7% of men. The largest part of respondents (35.7%) is between 21 and 31 years old, followed by 24.8% older than 41, 24.7% between 31 and 41, and 14.8% less than 21. According to occupation, the largest number of respondents (44.6%) is employed, 35.5% are students, while 19.9% belong to pupils or unemployed or retiree. When it comes to education, most of respondents (38.8%) finished secondary school, 30.6% faculty, 25% college and 5.6% primary school. As for income, largest share (27%) has income between 45000 and 65000 RSD, 25.6% less than 25000, 24.9% between 25000 and 45000, and 22.5% more than 65000 RSD. Out of all respondents 62.1% lives in urban, while 37.9% in rural areas. The average family size is 3.07 (standard deviation 1.149).

The research was conducted in 2014. in Serbia. The questionnaire was used online as well as offline at points of sale. Respondents were asked about the brand they buy most frequently belonging to chocolate (320 respondents), coffee (340 respondents) and bottled water (340 respondents). To the respondents was given the list of different media and they were asked to select those through which they had contact with that brand as well as to describe the brand as they see it, to write down its slogan, color or any other perceived important characteristic.

The respondents were segmented into the respondents who perceive the message as confusing (regardless of the number of promotion instruments they are exposed to) – named first segment, respondents who perceive the message in accordance with the promotional mix but were exposed to the influence of only one of the promotion instruments – named second segment, and respondents who perceive a unique message in line with the promotional mix of its sender from several promotional instruments – named third segment. As already stated, the assessment whether the message is perceived in accordance to promotional mix of sender was performed by marketing experts within qualitative analysis.

In determining whether there were differences in regard to the economic effects (the self-reported amount of money spent monthly for the mostly purchase brand and the frequency of buying it) of IMC between segments, one-way ANOVA, independent samples t-test, Kruskal-Wallis test, and Man-Whitney U test were used. Specific analyses have been carried out in order to explore whether by increasing the number of promotion instruments to which consumers are exposed in the third segment, certain economic effects increase. For the purposes of that research, Spearman's correlation coefficient was used.

Results

When it comes to research in regard to chocolate in the Republic of Serbia, out of the total of 320 respondents, to the first segment belong 58 or 18.1%, to the second 21 or 6.6%, while to the third belong 241 respondents or 75.3%. If considering the research in regard to coffee in the Republic of Serbia, out of a total of 340 respondents, to the first segment belong 107 or 31.5%, to the second 56 or 16.5%, whereas to the third 177 respondents or 52.1%. When it comes to research related to bottled water in the Republic of Serbia, out of a total of 340 respondents, to the first segment belong 133 or 39.1%, to the second 35 or 10.3%, while to the third 172 respondents or 50.6%.

The economic effects in regard to consumption of food brands within these three product categories (the average amount of money spent for a month for the brand that is mostly purchased) in the context of consumer segments derived from their exposure to IMC (related to brand they report as mostly bought) are shown in Table 1.

Table 1. Consumers differently perceiving marketing communication in regard to chosen food products and their spending

Product categories	Consumer segments	Average monthly spending for mostly purchased brand
Chocolate	Segment 1	2481.55
	Segment 2	1520.48
	Segments 1 and 2	2226.08
	Segment 3	4444.21
Coffee	Segment 1	1627.10
	Segment 2	1571.43
	Segments 1 and 2	1607.98
	Segment 3	2036.16
Bottled water	Segment 1	678.80
	Segment 2	758.00
	Segments 1 and 2	695.30
	Segment 3	1486.63

Source: own research

In each case, there is a comparison between all three segments, as well as between the first and the second segment observed together and the third segment.

Firstly, it should be noted that consumers who perceive a unique message in line with the promotional mix of its sender from several promotional instruments spend in average more than consumers who perceive the message as confusing or consumers who perceive the message in accordance with the promotional mix but were exposed to the influence of only one of the promotion instruments in all three cases – for chocolate, coffee and bottled water.

When it comes to chocolate, the results of one-way ANOVA show that there are statistically significant differences between segments: $F(2, 319) = 4.655$; $p = 0.010 < 0.05$, more precisely between the first and the third ($p = 0.042$), as well as between the second and the third segment ($p = 0.034$).

Furthermore, the results of the independent samples t-test show that respondents from the third segment statistically significantly differ from consumers from first two segments observed together: $t(318) = -2.982$, $p = 0.000 < 0.05$.

When considering coffee, the results of one-way ANOVA show that there are statistically significant differences between segments: $F(2, 339) = 4.987$; $p = 0.008 < 0.05$, more precisely between the first and the third ($p = 0.023$), as well as between the second and the third segment ($p = 0.045$).

In addition, the results of the independent samples t-test show that respondents from the third segment statistically significantly differ from consumers from two first segments together: $t(338) = -3.122$, $p = 0.002 < 0.05$.

If observing bottled water, the results of one-way ANOVA show that there are statistically significant differences between segments: $F(2, 339) = 24.187$; $p = 0.000 < 0.05$, more precisely between the first and the third ($p = 0.000$), as well as between the second and the third segment ($p = 0.001$).

Finally, the results of the independent samples t-test show that respondents from the third segment statistically significantly differ from consumers from first segments observed jointly: $t(338) = -7.006$, $p = 0.000 < 0.05$.

Table 2 considers economic effects in regard to consumption of food brands within these three product categories (the average frequency of purchasing for the brand that is mostly purchased) in the context of consumer segments derived from their exposure to IMC (related to brand they report as mostly bought). As well as in previous considerations, there is a comparison between all three segments, as well as between the first and the second segment observed together and the third segment.

Table 2. Consumers differently perceiving marketing communication in regard to chosen food products and their frequency of purchasing

Product categories	Consumer segments	Once a month	Several times a month	Once a week	Every day	Total
Chocolate	Segment 1	22.4	44.8	20.7	12.1	100%
	Segment 2	19.0	42.9	23.8	14.3	100%
	Segments 1 and 2	21.5	44.3	21.5	12.7	100%
	Segment 3	3.3	19.5	36.9	40.2	100%
Coffee	Segment 1	6.5	42.1	34.6	16.8	100%
	Segment 2	7.1	35.7	53.6	3.6	100%
	Segments 1 and 2	6.7	39.9	41.1	12.3	100%
	Segment 3	10.2	22.0	52.0	15.8	100%
Bottled water	Segment 1	6.0	45.1	42.9	6.0	100%
	Segment 2	11.4	40.0	40.00	8.6	100%
	Segments 1 and 2	7.1	44.0	42.3	6.5	100%
	Segment 3	4.1	36.6	25.0	34.3	100%

Source: own research

In the case of chocolate, the results of Kruskal-Wallis test show that there are statistically significant differences between segments: $c^2(2, n = 320) = 12.655$; $p = 0.002 < 0.05$. Additional research by using Mann-Whitney U test show that statistically significant difference exist between the first (Me = 12, n = 58) and the third segment (Me = 12, n = 241): $z = -3.249$; $p = 0.001 < 0.05$, in a manner that respondents from the third segment ($MR_3 = 170.53$) buy it more often than respondents in the first segment ($MR_1 = 128.71$).

When comparing the first and the second segment observed together ($MR_{1and2} = 129.91$) and the third segment ($MR_3 = 170.53$), the results of Mann-Whitney U test show that there is statistically significant difference: $z = -3.552$; $p = 0.000 < 0.05$.

In the case of coffee, the results of Kruskal-Wallis test show that there are statistically significant differences between segments: $c^2(2, n = 340) = 9.608$; $p = 0.008 < 0.05$. Additional research by using Mann-Whitney U test show that statistically significant difference exists between the first (Me = 12, n = 107) and the second segment (Me = 4, n = 56): $z = -2.596$; $p = 0.009 < 0.05$, in a manner that respondents from the first segment ($MR_1 = 193.06$) buy it more often than respondents in the second segment ($MR_2 = 156.66$). Furthermore, the results of Mann-Whitney U test show that statistically significant difference also exists between the first (Me = 12, n = 107) and the third segment (Me = 4, n = 177): $z = -2.746$; $p = 0.006 < 0.05$, in a way that respondents from the first segment ($MR_1 = 193.06$) buy it more often than respondents in the third segment ($MR_3 = 161.24$).

When comparing the first and the second segment observed together ($MR_{1and2} = 180.56$) and the third segment ($MR_3 = 161.24$), the results of Mann-Whitney U test show that there is no statistically significant difference: $z = -1.946$; $p = 0.052$ 0.05.

Finally, in the case of bottled water, the results of Kruskal-Wallis test show that there are statistically significant differences between segments: $c^2(2, n = 340) = 31.444$; $p = 0.000 <$

0.05. Additional research by using Mann-Whitney U test show that statistically significant difference exists between the first (Me = 12, n = 133) and the third segment (Me = 12, n = 172): z = -5.217; p = 0.000 < 0.05, in a manner that respondents from the third segment (MR_3 = 198.31) buy it more often than respondents in the first segment (MR_1 = 142.89). In addition, the results of Mann-Whitney U test show that statistically significant difference also exists between the second (Me = 4, n = 35) and the third segment (Me = 12, n = 172): z = -3.355; p = 0.001 < 0.05, in a way that respondents from the third segment (MR_3 = 198.31) buy it more often than respondents in the second segment (MR_2 = 138.73).

When comparing the first and the second segment observed together (MR_{1and2} = 142.02) and the third segment (MR_3 = 198.31), the results of Mann-Whitney U test show that there is statistically significant difference: z = -5.602; p = 0.000 < 0.05.

Table 3 focuses only on consumers who perceive a unique message in line with the promotional mix of its sender from several promotional instruments. The special emphasis is on the number of promotional instruments respondents reported they were in contact with. Furthermore, that number is brought in relation with the average amount of money spent for a month for the brand that is mostly purchased as well as with mean ranks of the average frequency of purchasing for the brand that is mostly purchased.

Table 3. Number of promotional instruments to which were exposed respondents from the third segment and economic effects of IMC

Number of promotional instruments	Chocolate		Coffee		Bottled water	
	Average spending	Mean rank of frequency	Average spending	Mean rank of frequency	Average spending	Mean rank of frequency
2	1020.00	104.00	1414.29	89.50	460.00	39.60
3	1709.38	97.79	1494.12	71.54	1014.71	72.24
4	2505.34	100.39	2122.22	95.21	1023.68	67.47
5	3754.90	114.38	2151.16	92.03	1733.33	90.86
6	4211.41	131.76	1953.13	86.39	1811.63	103.16
7	7526.57	136.75	2605.56	99.86	1820.83	103.00
8	10200.71	135.79	3057.14	106.71	1472.22	78.78

Source: own research

When it comes to chocolate, it can be stated that there is a positive, moderate and statistically significant correlation between the number of instruments to which the respondents from the third segment were exposed to and the average amount of money spent for a month for the brand that is mostly purchased: ρ = 0.309, n = 241, p < 0,05.

If considering Table 3, it can be seen that in the largest number of cases, as the number of promotional instruments to which the respondents from the third segment in relation to chocolate in Serbia were exposed increases, there is also an increase in the mean rank of the frequency of purchasing of the mostly bought chocolate brand.

In the case of coffee, it can be seen that there is a positive, weak and statistically significant correlation between the number of instruments to which the respondents

from the third segment were exposed to and the average amount of money spent for a month for the brand that is mostly purchased: $\rho = 0.228$, $n = 177$, $p < 0,05$.

When observing Table 3, it can be seen that in half of the cases, as the number of promotional instruments to which the respondents from the third segment in relation to coffee in Serbia were exposed increases, there is also an increase in the mean rank of the frequency of purchasing of the mostly bought coffee brand.

Finally, when considering bottled water, it can be stated that there is a positive, weak and statistically significant correlation between the number of instruments to which the respondents from the third segment were exposed to and the average amount of money spent for a month for the brand that is mostly purchased: $\rho = 0.276$, $n = 172$, $p < 0,05$.

If observing Table 3, it can be seen that in half of the cases, as the number of promotional instruments to which the respondents from the third segment in relation to bottled water in Serbia were exposed increases, there is also an increase in the mean rank of the frequency of purchasing of the mostly bought bottled water brand.

Discussion

The first hypothesis that consumers who perceive marketing communications in relation to a particular product as integrated, statistically significantly differ from other consumers in spending a higher amount of money to purchase that product is confirmed at the level of all researched products. The second hypothesis that consumers who perceive marketing communications in relation to a particular product as integrated, statistically significantly differ from other consumers in the fact that they are more often buying this product is partially confirmed - the exception is the respondents who belong to that segment and filled up questionnaires about coffee in Serbia. However, the amount of money can be considered a more relevant measure, since in a smaller number of purchases one can spend more money. Hence, the existence of the economic effects of integrated marketing communications can be regarded as confirmed.

Considering the character of the research in terms of covering a large number of brands, since each respondent filled out the questionnaire in the context of the most-purchased brand of one of the three product categories to which the questionnaire referred, the observation of these economic indicators is the first step in the consideration of the existence of synergistic effects of integrated marketing communications. Namely, the fact that members of the third segment are characterized by dominantly expressed above indicators in comparison to respondents who perceive the message in accordance with the promotional mix of its sender, but were exposed to the action of only one promotion instrument, but also in comparison to the respondents who perceive the message as confusing (without given the number of promotional instruments they are exposed to, so it is possible that it is the same number of instruments as for those from the third segment) can speak in favor of the existence of synergistic effects of integrated marketing communications.

The deepening of such an analysis was directed (in observing only the respondents in the third segment) to investigate the existence of a positive correlation between the number of promotional instruments to which influence were exposed the respondents and the average values of the amount of money for the products purchased, which is confirmed. In the same sense, it is also possible to interpret the number of cases in which the mean rank of the frequency of purchase increases, as the number of promotional instruments to which influence were exposed the respondents in the third segment - in the sense that this is in most cases (chocolate) or in half of the cases (coffee and bottled water).

Conclusions

The existence of synergistic effects of integrated marketing communication instruments has been tested from the aspect of the economic effects observed through purchasing frequency and spending on purchases based on self-reported consumption of researched consumer goods. The results of the research have shown that there are positive economic effects of integrated marketing communication when it comes to buying coffee, water and chocolate.

The research points out to important managerial implications for companies within food sector. It would be of the greatest importance for them to implement integrated marketing concept in function of increasing their sale. The implementation of this concept considers the need of delivering the message through various channels as well as the need for consistency of that message.

The presented methodology is innovative and is focused on consumer perspective. Future researches would gain even more importance if it would be possible to identify purchasing data from retailers' databases and interview respondents identified in such a way.

Conflict of interests

The author declares no conflict of interest.

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THE PROBLEM OF THE DEMAND FOR CROP INSURANCE: THE CASE OF SERBIA

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ABSTRACT

Worldwide researches of the crop insurance suggest two key problems: the lack of the insurer's interest for defining supply and on the other side, insufficient interest of farmers – potential insureds. The role of the state is necessary in promoting insurance in agriculture, as well as in financing researches that are not exclusively commercial. Having in mind numerous risks and forms of managing them, starting from the fact that risk management is the basis of economic survival of agricultural production, and the lack of previous research in this area, our research is aimed at identifying key incentive and restrictive factors that determine the demand of individual farmers for crop insurance in Serbia. Different conclusions are made on the base of 12 tested hypotheses related to the problem of promoting the demand for crop insurance. Measures of dependence that were used in this paper are Spearman's rank correlation coefficient and Pearson's contingency coefficient.

Introduction

Agricultural production has enormous social and economic importance worldwide. It is threatened by numerous risks, including natural disasters, variable weather conditions, uncertainty of yield and price. Research of the role of insurance in the financing damages caused by natural disasters and the improvement of agricultural production are generally rare. Worldwide researches suggest two key problems: the lack of the insurer's interest for setting supply and on the other side, insufficient interest of farmers – potential insureds. The state also has an important role in promoting insurance in agriculture. Insurers and state should inform and educate potential contractors of crop insurance in order to change their perception of insurance as an unnecessary cost.

Having in mind numerous risks and forms of managing them, starting from the fact that risk management is the basis of economic survival of agricultural production, and the lack of previous research in this area, our research is aimed at identifying key incentive and restrictive factors that determine the supply (the insurance sector) and demand (individual farmers) for insurance, as well as comparison to foreign experience and determination of possibilities and suggestions for improvements. The aim of the research is analyzing the role of crop insurance in financing the consequences of natural disasters and proposal of

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solutions for improvement on the macro and micro level in order to provide sustainable development of agricultural production. Through the research we analyzed the factors that determine demand for crop insurance in Serbia. Some of those factors are the size of the damage at the level of individual farmer's household, attitudes of farmers in terms of risk management, the role of insurance and trust in the institution of insurance, as well as factors that determine the supply and capabilities and interest of the private sector for insurance.

The reminder of this article is organized as follows. After the Introduction, the second section presents the importance of promoting the demand for crop insurance as an instrument of risk management in agriculture. The data, methodology and empirical results are presented in the third section that is followed by the conclusion.

The importance of the demand for crop insurance

In the literature there are different classifications of the available treatment of risks of agricultural production. According to European Commission EC (2001) all forms of risk treatment can be classified into: 1) measures applied at farms (for example, selection of products with low risk exposure, short production cycles, diversification of product programs and vertical integration) and 2) measures of risk sharing (for example, agreements on agricultural production, contracts for the sale of agricultural products, futures, joint funds and insurance). Hirsch and Nell (2008) classify: 1) *ex ante* approaches, which involve the farmers' use of risk management activities before the realization of the damage (for example, diversification of crops, bio-security measures such as fencing cattle or implementation of hygienic conditions in the stables, as well as insurance) and 2) *ex post* approaches which include measures after realization of the damage (for example, forced slaughter, herd rebuilding, sale of assets, the use of the loans, measures of state intervention in the event of catastrophic damage and the use of social programs funds). We consider that the classification of the different risk treatment in the agriculture according to the type of risk is the most important and regarding that are distinguished (Pejanović, Njegomir, 2011): 1) the general applicable management measures for all risks (for example, diversification, vertical integration, agreements on agricultural production, the creation of individual savings accounts, cooperatives and association of farmers), 2) the price risk management measures (for example, contracts sales of agricultural products, futures, options, swaps, forwards) and 3) production risk management measures (for example, preventive measures and insurance).

In managing agriculture production risk, key roles have prevention, the state and insurance. Risk prevention aims to prevent the realization or to reduce the probability of adverse events. The state intervention is justified only in cases when the risk management measures based on market principles are not applicable or not available. Insurance is the key mechanism of risk management in agriculture, especially in developed countries. Agricultural insurance is a special type of insurance and it is part of property insurance. Insurance companies in the world and in our country, recognizing the specific nature of agriculture insurance, set up special departments to deal with this type of insurance or the acquisition of this type of insurance is left to specialized agencies (Njegomir et al., 2017).

Modern insurance as a form of risk management has been emerged with the development of private property and the development of mathematics and statistics, although the risk pooling as a basic characteristic of insurance existed in the first human community too, when people were joining together in groups or tribal in order to share risk with each other (Rejda, 2005). Individual farmers pay insurance premiums in order to provide protection from damages caused by hail, fire, theft of property of the farmer's household, livestock death or diseases, as well as death or illness of insured farmer. In Serbia in 2012 total agricultural insurance premium per farm was relatively small and amounted only about EUR 30, although there is possibility of 40 % state subsidies for insurance premiums. Large number of farmers are still not contracting insurance of agriculture (Skakavac et al., 2017). According to the Čolović and Mrvić Petrović (2014) the main problem of crop insurance is not only existing the risk, but the way of providing protection through the crop insurance, too. They have analysed crop insurane in the USA, in some EU contries and Serbia too and highlighted three possibilities: insurance companies under the state control, public-private partnerships and private insurance companies that have business on a commercial basis.

The key role of insurance in the agricultural production and society in general is indirect economic protection of life and property from the adverse effects of natural forces and accidents. Insurance promotes agricultural production by making the entrepreneurial activities of farmers more stable and more certain. Insurance reduces the uncertainty of farmers and the need to create individual savings accounts or funds, given that the need for cash reserves is reduced (Raulston et al., 2010). It enables farmers to invest profitably their financial accumulation that further supports the development of agriculture. Insurance provides indirect economic protection in terms of the destructive effects of natural forces and activities of humans, but insurance is also a form of collateral that allows farmers easier access to the capital at lower costs. Njegomir et al. (2017) have also researched relation between climate changes and insurance of agriculture. After the extreme price rise of agricultural products and food in 2007 and 2008 it has been highlighted the importance of security of food supply whereby the Inter-American Institute for Cooperation in Agriculture pointed out that food safety is the most important issue today.

World Bank has a similar attitude which indicates that insurance companies do not commit enough attention to the crop insurance, which is one of the ten key factors in solving the problem of food supply crisis, represents a serious barrier to productivity, investments and efficiency of marketing systems in agriculture (World Bank, 2008). Additionally, crop insurance has become more important regarding the exclusion of state subsidies for the insurance premiums from the Free Trade Agreement of 1994 (World Trade Organization) with the argument that the insurance provides financial compensation for the climate and natural disasters (Baez, Wong, 2007).

Crop insurance has a different importance worldwide. Similar to the trends in the economy and society as well as the global trends in the insurance market, crop insurance is the most developed in developed countries. These trends are contrary to the relative importance of agriculture in these countries. However, in recent years there is a trend of increasing importance of crop insurance thanks to (Kaira, Xing, 2013):

- large national insurance programs and/or increase of state support in the form of subsidies for insurance premiums;
- positioning of agriculture as a priority sector in a numerous emerging markets;
- the opening of the local agricultural sector to the global and private insurers, which resulted in offering more innovative insurance products and the transfer of global expertise and practices;
- innovations in crop insurance products, such as the index-based products and products with distant reading of factors needed for the analyses and even resolution of claims;
- increased focus of global reinsurers and supranational organizations to the development of crop insurance;
- public-private partnerships; These partnerships involve cooperation between governments and private insurers and reinsurers, and have emerged considerably in recent years. They contribute to the successful implementation of numerous programs of crop insurance in different regions of developing countries.

In some countries, such as India and Brazil, the state has a very important role in the field of crop insurance. In Argentina as well as in South Africa there is no government intervention and subsidies (Baez, Wong, 2007). Considering the countries of Eastern Europe, it can be noticed that state influence regarding crop insurance is present, but not enough.

In most countries, private crop insurance is not sustainable without state subsidies (Skees et al., 1999), although their amount is constantly increasing. In the period to 2007, subsidies for crop insurance premiums on the global level reached almost $ 12 billion (Mahul, Stutley, 2010), while in 2011 only in the United States reached $ 7.4 billion, or 62% of total crop insurance (GAO, 2012). Žarković et al. (2014) have also emphasized direct relationship between the involvment of the state and degree of crop insurance development. Having in mind global importance of food production, crop insurance is widely subsidized by governments of both deveoped and emerging countries.

Table 1. Comparative review of crop insurance state subsidies among the former Yugoslav countries

Country	**State subsidies as a % of insurance premium**	**By-law regulation the amount of state subsidy**
Montenegro	50%	Agricultural budget Ministry of agriculture and rural development of Montenegro
Federation of Bosnia and Herzegovina	50%, max. to 30000KM (€ 15.339)	Rules on conditions and way of realization of financial support to agriculture

Country	State subsidies as a % of insurance premium	By-law regulation the amount of state subsidy
Croatia	25%, max. to 500000HRK (€ 66.483) additionally to 25%	Rules on realisation right for support in case of possible damages in agriculture Rules of particular districts
FYR Macedonia	60%, max. to 200000MKD (€ 3.247)	Agriculture and rural development law
Republic of Srpska	50%, max. to 25000KM (€ 12.782)	Rules on conditions and way of realization of financial support for development of agriculture and villages
Slovenia	40% for crops 30% for livestock with municipal subsidies upto 50%	Regulation on cofinancing crop insurance premiums
Serbia	40%, with possibility of additional municipal subsidies	Regulation on conditions and way of cofinancing premiums for insurance of crops, livestock, young vineyards and orchards

Source: author's compilation from various sources stated in the table

Data in Table 1 suggest that there are state subsidies for crop insurance and livestock insurance in all former Yugoslav countries and they vary in percent of total payed insurance premium. State subsidies for crop insurance premiums are usually set by Ministry of agriculture and implemented by Agriculture and rural development law or some other by-law regulations and rules related to agriculture, rural development and co-financing of crop insurance premiums. In Serbia and Croatia there is possibility for additional subsidies financed by municipalities or districts. Regardless the state subsidies and increasing negative impact of climate changes on the agriculture, demand for the crop insurance is still underdeveloped (Njegomir et al., 2016).

Data and methodology

Our focus in this paper is analyzing factors that booster demand for crop insurance as a mechanism of risk management in the agriculture. On the basis of available literature and empirical evidence (answers of survey participants) we set 12 hypotheses in order to test factors that have prevalent impact on promoting crop insurance in Serbia. We used statistical analysis for data processing, analyzing and presenting.

There were 170 survey participants, engaged in agriculture as a core business and source of household's income or agriculture is their side business, combined with some other kind of activities and income sources. Descriptive statistics measures were used for sample description. Measures of dependence that were used in this paper are Spearman's rank correlation coefficient and Pearson's contingency coefficient. Spearman's rank correlation coefficient (ρ) is used to identify and test the strength of a relationship between two sets of data. Spearman's ρ is the non-parametric test which means it does

not rely on data belonging to any particular distribution. Spearman's ρ is equivalent of the Pearson product-moment correlation coefficient. Their results and the way of calculating are closely similar, but the Spearman's ρ first ranks the data. Pearson's contingency coefficient is a measure of the relative strength of any association between two variables. The coefficient always has value less than 1 and varies according to the number of rows and columns.

Calculating of the Pearson's contingency coefficient:

$$C = \sqrt{\frac{X^2}{n + X^2}}$$

Results and discussions

In this paper we have set and tested 12 hypotheses.

H1: ***Higher level of formal education has impact on increasing interest for contracting crop insurance***

Through the analysis of the education of respondents, it can be seen that 65 % of them completed high school, 15 % of them completed primary school and 20 % of respondents were highly educated, which indicated the increasing level of education of people engaged in agriculture business. Testing by Spearman's rank correlation coefficient(ρ) it was not identified linear relationship between two variables: interest for contracting crop insurance and level of formal education (ρ_S=0,058, p=0,453). The relationship between these variables is nonlinear.

Hypothesis is partly confirmed.

Contingency coefficient showed statistically significant relationship between these two variables (C=0,194, χ^2=6,622, p=0,04).

Table 2. Crosstabulation of interest for contracting crop insurance and level of formal education

		Interest for contracting crop insurance		Total
		no	yes	
Formal education	Primary school	15	10	25
	High school	86	28	114
	Faculty	16	14	30
Total		117	52	169

Source: author's calculations

Data in Table 2 show that although high school respondents were dominant in the sample, only 25 % of them were interested for contracting crop insurance, in comparison to 40 % of primary school respondents and 47 % of respondents with faculty degree.

H2: ***Demand for crop insurance depends on perception of contracting crop insurance.***

Contingency coefficient showed statistically significant relationship between demand for crop insurance and perception of contracting crop insurance (C=0,393, $\chi 2$=27,437, p=0,000).

Hypothesis is confirmed.

Table 3. Relationship between two variables determined by contingency coefficient (C)

	Value
χ^2	27.437
C	.393
df	3
p	.000
N	150

Source: author's calculations

Table 4. Crosstabulation of variables demand for crop insurance and motives of contracting crop insurance, with review of answers

		Contracting crop insurance		Total
		no	yes	
Motives of contracting crop insurance	Insurance as a precondition for getting a loan	5	0	5
	Insurance is necessary for the protection of damages caused by natural disasters	43	44	87
	Insurance is recommended by friend or neighbour	1	2	3
	I don't know	49	6	55
Total		98	52	150

Source: author's calculations

Even 85 % out of total number of respondents who contracted crop insurance consider that insurance is necessary tool of protection in case of damages caused by natural disasters. Other motives (answers) given to the respondents are mainly not important for their decision to insure their agricultural business, while the majority of respondents do not have motive and reason to insure their agricultural production.

This result indicates that there are necessary continuous and long-term efforts in order to increase level of awareness of current and potential insured in the branch of agriculture and to give them additional information about the advantages of crop insurance.

H3: ***Demand for crop insurance depends on purpose of doing agricultural business***

Pearson's Chi-square test suggest there is no statistically significant relationship between the demand for crop insurance and purpose of doing agricultural business, except in the case of doing agriculture as a core business, where is suggested marginal statistical significance. (p=0,077).

Table 5. Relationship between variables determined by Phi coefficient and Chi-square (χ^2)

Purpose		**Contracting crop insurance**
Agriculture as a core business and main source of household's income	χ^2	3.122
	Φ	.136
	df	1
	p	.077
Agricultural production as a source of satisfying basic household's needs	χ^2	.382
	Φ	.047
	df	1
	p	.536
Agriculture as additional source of household's income	χ^2	1.306
	Φ	-.042
	df	1
	p	.253

Source: author's calculations

Table 6. Crosstabulation of variables demand for crop insurance and purpose of doing agricultural business, with review of answers

		Contracting crop insurance			
		no		**yes**	
		frequency	**%**	**frequency**	**%**
Agriculture as a core business and main source of household's income	no	59	50.4%	19	35.8%
	yes	58	49.6%	34	64.2%
Agricultural production as a source of satisfying basic household's needs	no	87	74.4%	37	69.8%
	yes	30	25.6%	16	30.2%
Agriculture as additional source of household's income	no	93	79.5%	46	86.8%
	yes	24	20.5%	7	13.2%
Other	no	113	96.6%	52	98.1%
	yes	4	3.4%	1	1.9%

Source: author's calculations

By reviewing frequency of answers of respondents it can be seen that respondents whom agriculture is a core business and the main source of household's income, are the main group of respondents (64 %) interested in contracting insurance of their agricultural production. Only 30 % of respondents who organize own agricultural production in order to satisfy the basic needs of their households and 13 % of respondents whom income from the agriculture is additional income, are interested in contracting crop insurance.

Hypothesis is rejected.

H4: ***Demand for crop insurance depends on annual household's profit of agricultural production***

Spearman's rank correlation coefficient (ρ) suggest statistically significant linear relationship between the demand for crop insurance and annual household's profit of agricultural production (ρS=0,341, p=0,000).

Hypothesis is confirmed.

Contingency coefficient shows statistically significant relationship between demand for crop insurance and annual household's profit of agricultural production (C=0,386, $\chi 2$=29,609, p=0,000).

Table 7. Crosstabulation of variables demand for crop insurance and annual household's profit of agricultural production, with review of answers

		Contracting crop insurance		Total
		no	yes	
Annual profit of agricultural production	Below EUR 2.000	31	3	34
	Between EUR 2.000 and 4.000	18	6	24
	Between EUR 4.000 and 6.000	15	3	18
	Between EUR 6.000 and 10.000	14	4	18
	Above EUR 10.000	39	37	76
Total		117	53	170

Source: author's calculations

Data in Table 7 suggest that out of total number of respondents that have declared that they insure their agricultural production, even 70 % of respondents (households) have earned more than EUR 10.000 by doing agricultural business. This result has been expected, having in mind that respondents who organize agricultural production on the larger arable land, have larger investment in agriculture, but higher income, expenditures and profit, too. Due to higher exposure to risk and larger potential losses in the agriculture, they are more interested in the insurance. Other groups of respondents who have annual profit below EUR 10.000 are less interested in contracting insurance of their agricultural production.

H5: ***Demand for crop insurance depends on key causers of losses in agriculture***
Pearson's Chi-square test suggests there is no statistically significant relationship between the demand for crop insurance and key causers of losses in agriculture.

Hypothesis is rejected.

Table 8. Relationship between variables determined by Phi coefficient and Chi-square (χ^2)

		Contracting crop insurance
Natural disasters (drought, flood, hail, frost, etc)	χ^2	.918
	Φ	.073
	df	1
	p	.338
Increase of production costs (increase of purchase price of seed, fuel, fertilizer, etc.)	χ^2	2.342
	Φ	.117
	df	1
	p	.126
Decrease of selling price of agricultural products	χ^2	.106
	Φ	-.025
	df	1
	p	.745
Infectious diseases, pests	χ^2	.676
	Φ	.063
	df	1
	p	.411[a]

Source: author's calculations

Note: a. More than 20% of cells have expected frequency of 5, result might be unstable

Table 9. Crosstabulation of variables demand for crop insurance and key causers of losses in agriculture, with review of answer

		Contracting crop insurance			
		no		yes	
		frequency	%	frequency	%
Natural disasters (drought, flood, hail, frost, etc)	no	25	21.4%	8	15.1%
	yes	92	78.6%	45	84.9%
Increase of production costs (increase of purchase price of seed, fuel, fertilizer, etc.)	no	96	82.1%	38	71.7%
	yes	21	17.9%	15	28.3%
Decline of selling price of agricultural commodities	no	97	82.9%	45	84.9%
	yes	20	17.1%	8	15.1%
Infectious diseases, pests	no	115	98.3%	51	96.2%
	yes	2	1.7%	2	3.8%
Other	no	112	95.7%	49	92.5%
	yes	5	4.3%	4	7.5%

Source: author's calculations

Data in table indicate that the majority of respondents (85 %) contracted insurance of their agricultural production in order to prevent themselves from the losses caused by natural disasters (drought, flood, hail, frost, etc.) that are even more frequent and intensive in the last decade. Other suggested causers of losses in the agricultural production (increase of production costs, decline of selling price of agricultural commodities, infectious diseases and pests) mainly do not affect decision of respondents regarding contracting crop insurance.

H6: ***Demand for crop insurance depends on using state subsidy for compensation***

Phi coefficient suggests there is statistically significant relationship between the demand for crop insurance and using state subsidy for compensation (Φ =0,324, χ2=17,676, p=0,000).

Hypothesis is confirmed.

Table 10. Crosstabulation of variables demand for crop insurance and using state subsidy for compensation, with review of answers

		Contracting crop insurance		Total
		no	yes	
Using state subsidy for compensation	no	109	38	147
	yes	6	15	21
Total		115	53	168

Source: author's calculations

Data in table indicate that 87,5 % of total number of respondents do not use state subsidies for compensation. In the group of respondents (12,5 %) that use state subsidies for compensation, majority of them (71 %) decide for crop insurance. Respondents who are users of state subsidies for compensation are more interested in crop insurance.

H7: ***Demand for crop insurance depends on application of preventive measures in agricultural production (as an alternative of insurance)***

Pearson's Chi-square test suggests there is statistically significant relationship between the demand for crop insurance and application of preventive measures in agricultural production (as alternative of insurance) only if protective measures are not applied. There is no statistically significant relationship between the demand for crop insurance and preventive measure such as advanced protection and selection of crops, but there is marginal statistical significance between the demand for crop insurance and protective measure such as crops rotation (p = 0.077). Respondents who have declared that their households do not insure their agricultural production, mainly do not apply risk prevention systems (Φ = -.318, χ^2=17,175, p=0,000).

Hypothesis is rejected.

Table11. Relationship between variables determined by Phi coefficient and Chi-square (χ^2)

		Contracting crop insurance
Advanced protection (irrigation, hail protection, etc.)	χ^2	.606
	df	1
	Φ	-.060
	p	.436
Crops' choice	χ^2	.001
	df	1
	Φ	.003
	p	.971
Crops' rotation	χ^2	3.122
	df	1
	Φ	-.136
	p	.077
I do not apply measures of risk's management	χ^2	17.175
	df	1
	Φ	-.318
	p	.000*

Source: author's calculations

Note:*Relationship is significant at the level of statistical confidence < 0,01

Table 12. Crosstabulation of variables demand for crop insurance and application of protective measures in agricultural production with review of answers

		Contracting crop insurance					
		no			yes		
		frequency	%	%	frequency	%	%
Advanced protection (irrigation, hail protection, etc.)	no	101	86.30%	67.79%	48	90.60%	32.21%
	yes	16	13.70%	76.19%	5	9.40%	23.81%
Crops' selection	no	82	70.10%	68.91%	37	69.80%	31.09%
	yes	35	29.90%	68.63%	16	30.20%	31.37%
Crops' rotation	no	58	49.60%	63.04%	34	64.20%	36.96%
	yes	59	50.40%	75.64%	19	35.80%	24.36%
I do not apply measures of risk's management	no	86	73.50%	61.87%	53	100.00%	38.13%
	yes	31	26.50%	100.00%	0	0.00%	0.00%

Source: author's calculations

Data in table show that majority of respondents do not apply measures of risk management in agriculture. It has to be emphasized that respondents do not perceive insurance as a measure of risk management. Also, in questionnaire was option to choose more than one measure of risk management and this fact could cause such statistical result. Majority of respondents that apply other preventive measures in agricultural production, do not contract crop insurance.

H8: ***Demand for crop insurance depends on estimation of percentage decrease in total yield caused by natural disaster***

Testing by Spearman's rank correlation coefficient (ρ) it is not identified statistically significant linear relationship between two variables: demand for crop insurance and estimation of percentage decrease in total yield caused by natural disaster (ρ_S=-0,079, p=0,312).

Contingency coefficient shows there is no statistically significant relationship between demand for crop insurance and estimation of percentage decrease in total yield caused by natural disaster (C=0,125, χ^2=2,670, p=0,125).

Hypothesis is rejected.

Table 13. Crosstabulation of variables demand for crop insurance and percentage decrease in total yield caused by natural disaster with review of answers

		Contracting crop insurance		Total
		no	yes	
Percentage decrease in total yield caused by natural disaster	0% to 20%	17	11	28
	20% to 40%	62	28	90
	40% to 60%	29	9	38
	60% to 80%	6	4	10
	80% to 100%	1	0	1
Total		115	52	167

Source: author's calculations

According to data in table 69 % of total number of respondents do not contract crop insurance, regardless of negative impact of natural disaster on yields in agriculture. Among the rest of respondents who contract crop insurance, there is significant participation of group of respondents who declared that their yields in agriculture have been decreased for about 20 to 40 % caused by natural disaster.

H9: ***Demand for crop insurance depends on size of agricultural land cultivated by respondent***

Spearman's rank correlation coefficient (ρ) suggest statistically significant linear relationship between the demand for crop insurance and size of agricultural land cultivated by respondent (ρ_S=0,347, p=0,000).

Contingency coefficient shows statistically significant relationship between demand for crop insurance and size of agricultural land cultivated by respondent (C=0,386, χ^2=29,609, p=0,000).

Hypothesis is confirmed.

Table 14. Crosstabulation of variables demand for crop insurance and size of agricultural land cultivated by respondent with review of answers

		Contracting crop insurance		Total
		no	yes	
Size of agricultural land cultivated by respondent	0,5-1 ha	17	1	18
	1-3 ha	17	2	19
	3-5 ha	18	1	19
	5-10 ha	11	2	13
	10-20 ha	8	11	19
	above 20 ha	45	36	81
Total		116	53	169

Source: author's calculations

According to data in table, 69 % of total number of respondents do not contract crop insurance and within the group of remaining 31 % of respondents who pay insurance premium, the majority of them (68 %) cultivate more than 20 hectares of arable land. For this group of respondents is highly important to transfer risk and losses that might occur in agricultural production to the insurance companies through paying of insurance premium.

H10: ***Demand for crop insurance depends on perception of insurance as a cost or an investment***

Phi coefficient suggests there is statistically significant relationship between the demand for crop insurance and perception of insurance as a cost or investment (Φ =-0,430, χ^2=28,605, p=0,000).

Hypothesis is confirmed.

Table 15. Crosstabulation of variables demand for crop insurance and perception of insurance as a cost or an investment with review of answers

		Contracting crop insurance		Total
		no	yes	
Perception of insurance as a cost or investment	investment	31	36	67
	cost	76	12	88
Total		107	48	155

Source: author's calculations

As it has been commented earlier, only 31 % of total number of respondent's contract insurance of their agricultural production and look on insurance premium as an investment, not as a cost. Major of respondents (69 %) who are not interested in crop insurance, consider insurance premium as a cost (71 % of respondents in this group). This suggests necessity of education of farmers as potential insured through providing them additional information regarding insurance as a measure of managing risks, that are agricultural production is exposed to.

H11: ***Demand for crop insurance depends on possibility of realization income out of agriculture***

Phi coefficient suggests there is statistically significant relationship between the demand for crop insurance and possibility of realization income out of agriculture (Φ =-0,155, $\chi 2$=4,053, p=0,044).

Hypothesis is confirmed.

Table 16. Crosstabulation of variables demand for crop insurance and possibility of realization income besides agriculture with review of answers

		Contracting crop insurance		Total
		no	yes	
possibility of realization income besides agriculture	no	64	37	101
	yes	53	15	68
Total		117	52	169

Source: author's calculations

Respondents who realize income only within agriculture are more interested in crop insurance. In the group of 31 % of total number of respondents who insure their agricultural production, 71 % of them do not realize income out of agriculture. It has been expected, regarding that in case of risk and losses in agriculture, yield and income of this group of respondents would be threatened and next season agricultural production would be organized in the same or even smaller scale.

H12: ***Demand for crop insurance depends on type of agricultural production***

Pearson's Chi-square test suggests there is statistically significant relationship between the demand for crop insurance and crop husbandry, but not the other types of agricultural production.

Hypothesis is partly confirmed.

Table 17. Relationship between variables determined by Phi coefficient and Chi-square (χ^2)

		Contracting crop insurance
Crop husbandry	χ^2	5.900
	Φ	.186
	df	1
	p	.015*
Fruit growing	χ^2	.138
	Φ	-.028
	df	1
	p	.710
Wine growing	χ^2	2.334
	Φ	-.117
	df	1
	p	.127[a]

		Contracting crop insurance
Vegetable growing	χ^2	.613
	Φ	-.060
	df	1
	p	.434
Livestock husbandry	χ^2	.510
	Φ	-.055
	df	1
	p	.475

Source: author's calculations

Note: a. More than 20 % of cells have expected frequency below 5 and value of Chi-square (χ^2) is not reliable

* Relationship is significant at the level of statistical reliability below 0,01

Among the respondents who deal in crop husbandry, majority of them pay premium for crop insurance (Φ=0,186, χ^2=5,900, p=0,015).

Table 18. Crosstabulation of variables demand for crop insurance and type of agricultural production with review of answers

		Contracting crop insurance			
		no		yes	
		frequency	percent	frequency	percent
Crop husbandry	no	27	23.1%	4	7.5%
	yes	90	76.9%	49	92.5%
Fruit growing	no	99	84.6%	46	86.8%
	yes	18	15.4%	7	13.2%
Wine growing	no	112	95.7%	53	100.0%
	yes	5	4.3%	0	.0%
Vegetable growing	no	91	77.8%	44	83.0%
	yes	26	22.2%	9	17.0%
Livestock husbandry	no	94	80.3%	45	84.9%
	yes	23	19.7%	8	15.1%
Other types of agricultural production	no	116	99.1%	52	98.1%
	yes	1	.9%	1	1.9%

Source: author's calculations

On the base of data in Table 18 it can be noticed that in the group of respondents (31%) who contract crop insurance, 92 % of them are engaged in crop husbandry. There is almost equal participation of groups of respondents who are engaged in vegetable growing (17%), livestock husbandry (15%) and wine growing and who are contracting insurance of their agricultural production. Crop husbandry is dominant type of agricultural production, comparing arable land used for crop husbandry on the one side and wine growing or vegetable growing on the other side. Regarding that, larger amount of investments, but larger potential losses in case of risk realization can be expected. This might be the main reason and explanation why farmers engaged in crop husbandry are more interested in crop insurance.

Conclusions

Summarizing twelve tested hypotheses following can be concluded. Higher level of formal education of farmers does not necessarily mean that they will be more interested in crop insurance, although it was expected, but nonlinear relationship between these two variables was found in the sample and hypothesis is only partly confirmed. It has also been supposed that households and farmers who earned higher profit in agricultural business and cultivate more arable land are more interested and express increasing demand for contracting crop insurance and those hypotheses are confirmed. We have been aware that interest for contracting crop insurance depends a lot of farmers' perception of insurance premium as a cost of as an investment and this hypothesis is confirmed. It means that farmers who think that paying insurance premium is only cost mainly do not contract insurance of their agricultural production, unlike the farmers who perceive insurance premium as an investment. In this context the motive for deciding for insurance also has influence on demand for insurance. Farmers as current and potential insured should be aware and in detail informed about advantages of insurance, as a measure of risk management in order to decide more for insurance of their agricultural production. It is also important whether farmers realize some additional income out of agriculture or not. If agriculture is their core business and the main source of income of their households, in case of natural disaster and other risks in agriculture their investments can be more threatened with possibility of large losses. As it has been expected this group of farmers is more interested for insurance. The majority of farmers are engaged in crop husbandry and having in mind bigger arable land and greater investments in this type of agricultural production comparing to fruit, vegetable or wine growing, it was expected that this group of farmers would express greater interest for insurance. The majority of respondents do not use state subsidy for compensation of damages and logically they rather not decide for crop insurance and this hypothesis is also confirmed.

Although the majority of respondents that contract insurance of their agricultural production tend to prevent themselves from the losses caused by natural disasters (drought, flood, hail, frost, etc.), that are even more frequent and intensive in the last decade, there is no statistically significant relationship between the demand for insurance and key causers of losses in agriculture and the hypothesis is rejected. The majority of respondents estimate that their total yield has been decreased for approximately 20 to 40 percent caused by natural disaster, but they still do not contract insurance. Statistically significant linear relationship between these two variables has not been identified and hypothesis is rejected.

Insurance companies should improve Customer Relationship Management (CRM) in order to increase awareness and to give additional information to farmers as potential insureds, to innovate portfolio of insurance products and develop supply according to the specific needs of farmers.

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Conflict of interests

The authors declare no conflict of interest.

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FAMILY AND SOCIOCULTURAL CHARACTERISTICS OF THE OWNERS OF SELECTED FARMS IN VOJVODINA

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ABSTRACT

The paper analyzes the characteristics of family life of households on selected farms in the area of AP Vojvodina based on the results of the evaluation of the extension service activities. The evaluation was done on a representative sample. The aim of the paper is to gain insight into socio-cultural features, the characteristics of the households, the marital contingent, and the distribution of authority, and (gender) division of labour in the holding. It is concluded that some of the characteristics of a rural household, when family life is concerned, have changed, that attitudes about the gender division of work have been evolved, while the practices, however, remained the same, which testifies to their deep rootedness and the matrix of behaviour that is changing rather slowly.

Introduction

During the past century, the traditional family has undergone major changes. The specificities of the rural environment and the family require special attention when planning the development strategy of the local rural communities, and the population and social policies that would respect the particularity of certain categories of population.

The general state of a global society has led to changes in family structure and family relationships. Global social changes, such as industrialization and modernization, have affected both the rural family and the rural *per se*, since they are not an isolated segment of society, nor can they be observed in such way. The rural family (and women as its backbone) for a long time were neglected in Serbian sociological research. The main theoretical standpoints in that field of research that formed the theoretical basis for the

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analysis in this paper include, first of all, studies conducted in Serbia country, which are: 1) views on the transformation of the enlarged patriarchal family and the confrontation of patriarchal and industrial principles at the time of the transformation of society, attitudes about continuity and changes in the rural family (Erlih, 1971); 2. Emphasis on the importance of the rural household and farm as the main production unit, and the former interrelation between family and production relations in the farmers' family (First, 1973, 1973a, 1981); 3. Views on the "sacrificial micro matriarchate" and the continuity of sacrifice as a long-term pattern of life in these areas, which was restored during socialism and transition (Blagojević, 1997); 4. Attitudes in regards to the characteristics of the cultural pattern of maternity of Serbs (Tripković, 1997); 5. An understanding of the re-traditionalization of family relations and the transformation of family and households due to the social crisis (Milić, 1986, 1989, 2004; Tomanović, 2006); and 6. Studies dealing with Serbian rural areas, culture and landmarks of the households and farms (Mitrović, 1999; Tripković, 1987; Šljukić, Janković, 2015; Bogdanov, Babović, 2014).

The family and main socio-cultural characteristics of households on farms are of great importance when it comes to analyzing the specificity of the conditions in which the agricultural extension process takes place. For this reason (among other data), these information were included in the project Evaluation of the work of the agricultural extension service of the AP Vojvodina, whose part of the results are presented in this paper. The survey covered 81 inhabited places in all seven districts in the area of AP Vojvodina and the sample is representative in every sense. For a long time, in Serbian sociological research there was a vacuum in investigation of rural families. Such a situation has been somewhat changed over the past decades, and this research is one of the ones that, among other, gives insights into the microcosm of rural life. This paper analyzes socio-economic characteristics of households, marital contingents, distribution of authority, and gender division of labour in the household.

Material and method

The analysis in this paper is based primarily on the results of the aforementioned project *Evaluation of the Work of the Agricultural Extension Service of the Autonomous Province of Vojvodina* with the selected agricultural farms, which was realized in 2012/2013.[4] The evaluation was conducted during 2012/2013. on the basic assembly of 4,112 selected farms and 92 advisors PSS APV. The sample was proportional and stratified. Territorial coverage was of all 13 agricultural extension services in AP Vojvodina, all engaged advisors, all specialities of their work, all types and sizes of selected farms.

4 The project leader was prof. dr Živojin Petrović, and coordinator of the project prof. dr Dejan Jankovic. The project was realized with the support of the Provincial Secretary of Agriculture, Water Management and Forestry of Vojvodina and the Department of Agricultural Economics and Rural Sociology, the Centre for Rural Development, Education and Training of Agricultural Advisors.

As the basis for the selection of the sample for the evaluation, only those selected farms for which there necessary basic data existed were taken into account. Thus, the data gathering was reduced to 2987 farms, and the sample was 10%, or 294 households. In the final analysis, the collection of necessary data has been done on a sample of a total of 281 selected farms, which means that 95.2% of the predicted sample was realized, which results can be qualified as representative. Each farm was visited by the interviewer and an interview with the householder was conducted. In the data collection participated 17 interviewers who had previously undergone basic training for going to the field. The questionnaire was divided into six segments and contained a total of 154 questions. One segment concerned exactly the family and household whose results and present the subject of the analysis of this paper. The results presented in this paper are also based on the analysis of data from the Census of Population, Households and Flats of R. of Serbia that was conducted in 2002 and 2011, as well as other publications of the Republic Institute for Statistics of Serbia.

Results and discussion

Socio-economic features of the households

The gender structure of the sample was dominated by men (95%), which is nineteen times more than female respondents (5%). The overwhelming age of respondents is between 40 and 59 years old (60.9%). Respondents aged between 30 and 39 are 16%, the age group of 60+ is represented by 18.8%, and the smallest of young people aged between 18 and 29 years (4.3%).

When considering the educational structure of the rural population according to the latest Census on the whole country, it is noted that today the secondary school is the most frequent degree of education of the rural population (42.37%). Second place is represented by primary education (27.68%), and only (6.1%) have higher or higher education. The highest number of households from the representative sample of selected agricultural farms in Vojvodina has completed secondary school (62.3%), which corresponds with the data of the Census on the most frequently achieved education on the territory of both Serbia and the region of Vojvodina. However, the educational structure of the household is somewhat more favorable than the overall rural population. Thus, 19.9% of households have an incomplete elementary or elementary school, while in Vojvodina the proportion of people in rural settlements with lower secondary education is 46.78%. Higher school completed have 7.8% and college every tenth householder. There is a high statistically significant and medium strong relationship between education and age of the farmer ($c2 = 56,229$; $p = 0,000$; $C = 0,408$), but not between this variable and the gender of the respondents ($c2 = 1,547$; $p = 0,818$). It turned out that the level of education lower from the secondary is the most represented among the oldest farmers (65+ years). Secondary school is also the most frequently achieved educational level of the husband/wife of the respondents (54.1%).

Table 1. Occupation of household keeper and spouse (%)

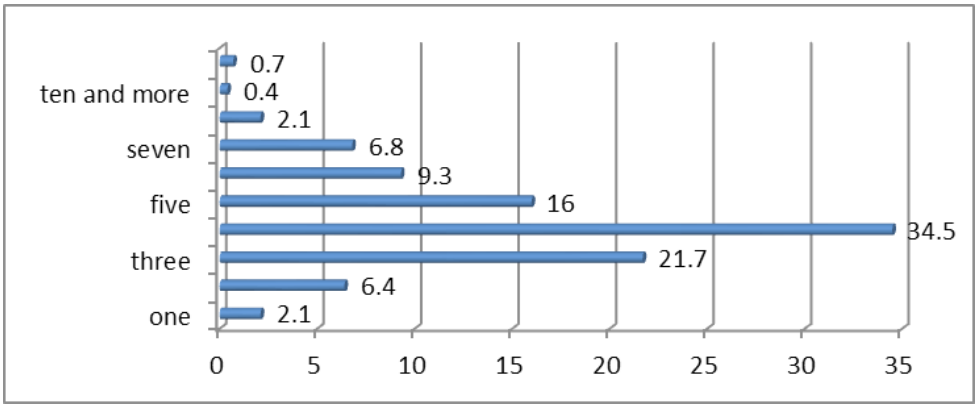
Occupation	Household keeper	Spouse
farmers	77,9	45,2
workers	7,1	10,0
craftsmen and service activities	0,4	0,4
merchants	0,7	2,5
civil servants	3,9	6,4
experts-professionals	1,4	6,0
managers, directors	3,6	1,8
persons with personal income *(pensioners, persons under guardianship...)*	4,6	6,8
unemployed, housewife	-	8,2
no spouse	-	7,5
no answer	0,4	5,3
TOTAL	100,0	100,0

Source: Authors' calculations

Among the interviewed householders in the structure of occupations, the greatest percentages are farmers (77.9%). The category of occupation of their spouse also dominates this category (Table 1). Interestingly, spouses are almost six times more likely to be represented among professionals than their own householders.

Former large families, family co-operatives, with many children and relatives living together, belong to past times. They were replaced by small family. The average size of the household in Serbia is 2.88 members and in the Vojvodina region 2.76 members (Census, 2013: 29). The situation is somewhat different at the sample level where the average number of household members is 4.26. Among the respondents, the largest share is of four-member households (34.5%). The next are three member families. Six or more members have only 18.6% of households, while the smallest share is of single families (2.1%) (Figure 1).

Figure 1. Number of household members (%)



Source: Authors' calculations

Regarding the economic situation of the household, approximately every tenth householder (9.6%) said that they have difficulty allocating funds for paying monthly bills, and 4.3% have a problem and allocate funds for medicines. About one in ten respondents (10.7%) have difficulty allocating funds for car maintenance and 27% have this problem with going to vacation. It is interesting to note that as many as 96.4 households own a car.

The economic status of their households 84.3% of the surveyed households assessed as good, while almost every ninth assessed that their material position was poor (11.7%). 1.4% of households assessed a very good financial situation of the household and, on the other hand, slightly more responded that the material situation was very poor (2.1%). Man-Whitney test showed that there is a statistically significant relationship between the estimation of the economic position and the type of household, but Cohen's criterion for this effect is small (U = 8765, z = -2,436, p = 0,015, r = 0,145). Thus, the assessment of the economic situation of a household according to the type of household (purely agricultural or mixed) shows that households with mixed incomes assessed their economic position as three times more often as *very good*. Respondents who have pure agricultural holdings (incomes) in 69.7% of cases estimated that their material situation is very poor. Considerably fewer respondents (30.3%) who have mixed households (incomes) have assessed the material situation as very poor (Table 2). On the other hand, Spearman's correlation coefficient indicates that there is no statistically significant relationship between the own estimation of the economic position and the number of household members (r_S = -0,053, p = 0,0380). Also, the Kruskal-Wallis test showed that there is no statistically significant relationship between the own assessment of the economic position and education (KW = 2.833, p = 0.586), and the owner's occupation (KW = 1.208, p = 0.991) = 9.841, p = 0.08).

Table 2. Respondents' estimation of the economic situation by type of household

How do you estimate the economic position of your household?	Type of household		Total
	Pure agricultural household (farm)	Mixed household	
Very good	25,0%	75,0%	100,0%
Good	46,8%	53,2%	100,0%
Bad	69,7%	30,3%	100,0%
Very bad	50,0%	50,0%	100,0%
TOTAL	49,3%	50,7%	100,0%

Source: Authors' calculations

The economic situation of the household today, compared to five years ago, is estimated as partially improved by 34.2% of respondents. Every fourth respondent said that the economic situation in the observed period remained the same (25.7%). There are also farmers (23.2%) who estimate that the economic situation worsened. Among those whose perception is that there has been a significant change in the economic situation of the household in relation to the period of five years ago, there are more of those who give a negative than a positive rating. Thus, 10.7% of respondents answered that the situation worsened considerably, compared to 6.1% who said they had improved significantly.

When cross tabulating the data on the assessment that the respondents gave about the economic situation of their household today and an estimate of it five years ago (Table 3), it follows that the largest number of respondents who assessed the economic situation as very good, also said that it has improved it in relation to the five years ago (75%). On the other hand, the largest number of respondents who assessed the economic situation as very bad, at the same time gave the answer that the situation worsened in relation to the period of five years ago (50%).

Table 3. Estimation of the economic situation today and five years ago

Estimation of economic position of the household	**Economic position of your household today in comparison to five years ago?**					***TOTAL***
	significantly improved	partially improved	remained the same	partially worsened	considerably worsened	
Very good	75,0%	25,0%	0,0%	0,0%	0,0%	100,0%
Good	5,5%	37,6%	27,4%	23,6%	5,9%	100,0%
Bad	3,0%	18,2%	18,2%	21,2%	39,4%	100,0%
Very bad	0,0%	0,0%	16,7%	33,3%	50,0%	100,0%
TOTAL	6,1%	34,3%	25,7%	23,2%	10,7%	100,0%

Source: Authors' calculations

Characteristics of marital and family life

In a Serbian traditional society marriage was considered as the only legitimate framework for reproduction. The appearance of out-of-wedlock birth was viewed negatively, and the social community was severely condemning them. In addition, it was taken care that young people did not get too old and to marry "on time". This age for women did not exceeded 20 and for men 25 years. The main reason for making early marriages in rural areas was shortages of labor force. By getting married another needy worker was provided in the house, and the reasons for the early marriage were that one sometimes rushed into the marriage to grab a rich girl, or to create a friendship between two families that have "fine reputation" (Đorđević, 1930).

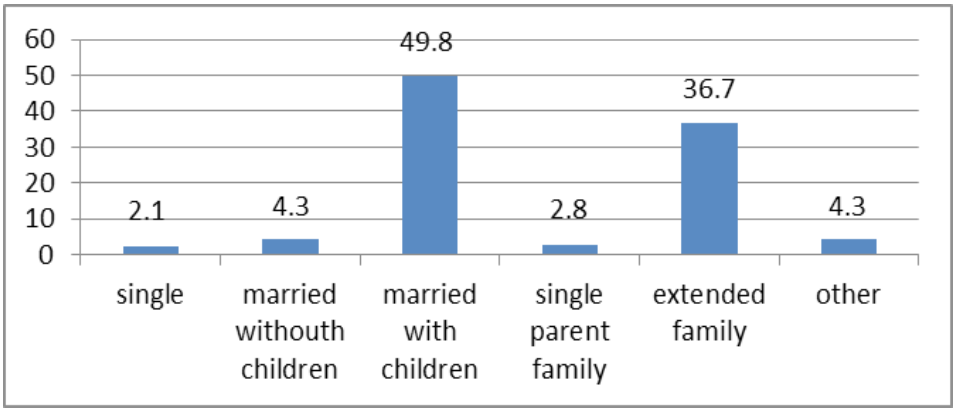
The official regulations also failed to change early marriage. The first regulation in Serbia determining age at marriage dates back to 1837 when it was established that the males could not get married before the age of 17 and females before the age of 14. However, they were not strictly respected because they were inconsistent with the national understanding of the age for marriage (Đorđević, 1930, Novakov, 2011). In the middle of the last century, the Marriage Act of 1946 did not allow the marriage of spouses under the age of 18, except with the special approval of the court. The average age of entering the first marriage in Serbia in 1952 was 23.8 years for a groom and 21.6 for bride (Burić, 1963: 79.84). That average in 2015, at the conclusion of the first marriage, rose to 31 years for men, and 28 years for women (RZS Press, 2016).

Serbia still has a high marriage rates, and marriage as an institution is still highly valued. More than half, or 57% of men and 53% of women over 15 years of age, live

in a marriage/community (Women and men in Republic of Serbia, 2014) in Serbia. However, in Serbia marriage is concluded, as we have seen, in the later life span, the birth decision is postponed, and the former feature of rural areas - high fertility – is replaced by the fact that according to the last Census, there is majority of families with only one child 51.79%) followed by families with two children (40.05%) (Census, book 17, 2014).

When considering the structure of households on the realized sample of households on selected farms, it follows that the most represented families of nuclear type are parents and children (49.8%), followed by extended families (36.7%). The households of a married couple without children make only 4.3% of the sample, single-parent families are 2.8% and single ones only 2.1% (Figure 2).

Figure 2. Structure of the family of respondents



Source: Authors' calculations

The surveyed householders also have high level of marriage: 88.3% are married, 7.8% are single, 2.5% are widowed, while 1.4% in the extra-marital community. In addition, the most numerous are householders who are married for 15 years or more (70.8%), 14.9% are married between 6 and 14 years and 4.2% to 5 years. The age of marriage was shifted to later years of the marital contingent, but still somewhat lower than on the whole country: by the age of 20, 6.8% of respondents entered the marriage, and 71.2% of them were between the age of 21 and 29 years. After thirty, only about one fifth respondent got married (22.9%). Householders were mostly married with bride/groom from the same village where they live (43.4%), that testifies to high geographical homogeneity, 32.7% have a spouse who originates from another village, and only 14.2% of spouses lead origin from a city. Such a small number of settlers from the city supports the long ago stated claims that, first of all, village girls try to migrate through marital mobility or, in the case of students, stay in town, and city girls rarely (and reluctantly) decide to move to the village .

We sought to investigate the marital/family authority through the question of deciding the respondents and family members about the purchase of land, agricultural machinery,

investments in auxiliary facilities or house, taking the land for rent, as well as the features of buying everyday goods and education for children. It turned out that most decisions of the householders are usually made independently, except when it comes to equipping a home, which is decided with her husband. Women do not usually decide on agricultural production, although they are included in it. In addition, the only item that is most commonly decided by wife is the purchase of everyday foods since the house is a "woman" sphere and that they know best what is missing in the house at the daily level (Table 4).

Table 4. The structure of the decision-making on households

Who mostly decides in household regarding:	Householder	Spouse	All grown-up family members	Householder and spouse together	Other
Land purchase	45,9	1,1	17,4	23,5	12,1
Leasing of the land	47,3	0,4	16,0	21,4	14,9
Investments in the construction and expansion of auxiliary facilities	44,8	0,7	18,5	24,2	11,8
Investments in the house construction and expansion	37,7	1,4	19,2	30,2	11,5
Equipping the house	28,8	10,3	19,9	32,0	9,0
Purchase of agricultural machinery	45,6	1,8	17,8	23,5	11,3
Purchase of everyday foods	15,7	33,8	16,0	25,3	9,2
Children education	12,1	11,0	11,4	51,2	14,3

Source: Authors' calculations

Half the last century, the family survived the big changes. While high fertility represented risk insurance in traditional societies, today the birth of a small number of children is also a way to avoid risk (Rašević, 1999: 31). Sometimes children were a significant work resource, especially in rural areas. Moreover, they were also a kind of insurance for old age: someone who will care for the elderly parents and someone who will continue the family tradition (celebrating family "slava"). So the reasons for the large number of children in rural families were economic and religious. In addition, male children were particularly preferred. The former need for a large number of children has been replaced by a high cost of parenting. In addition to giving sense in life for humans, parenting also requires considerable economic, psychological, and emotional resources. Thus, in modern conditions of life, norms have been adopted on a small number of children in the family - two children, possibly of a different sex, have become the desired reproductive norm in many countries.

Table 5. Families according to the number of children in the territory of Serbia - data by region

Region	Number of children in family					
	Total	1	2	3	4	5 and more
Belgrade region	24,06	25,13	23,34	21,36	18,19	17,95
Vojvodina region	27,09	27,57	26,60	26,08	26,69	32,81
Šumadija and West Serbia	27,98	26,52	28,64	33,89	36,25	30,00
South and East Serbia	20,87	20,78	21,42	18,67	18,86	19,24
Republic of Serbia	100	51,79	40,05	6,73	1,07	0,36

Source: Population census (2014): 28, 34

In Serbia population growth (balance) is negative for many years/decades. At the beginning of this century, it ranged from -3.3 promille in 2002, up to -4.9 in 2014. (Statistical Yearbook 2015: 35). Thus, according to the latest Census data, in Serbia the most prevalent families with one child are now (Table 5).

At the level of realized household sample, this situation is somewhat different in that the respondents most often had two children (62.2%). Three and more children had 13.2% of households (Table 6). Interestingly, householders often find that the preferred/ideal number of children in the family is three (45.2%), 32% consider them desirable, and every tenth (10.3%) preferred four children. Five and more children are desirable for 7.8% of households, while 2.8% did not respond. Only 1.8% of respondents responded it was ideal for families to have one child. In addition, they do not tie the perspective of their children to agriculture. Only slightly more than half (52.3%) of householders said they would like their children to be engaged in agriculture. As a reason, they most often responded that someone should inherit a job and that this is a family tradition. On the other hand, among the respondents who do not have a desire for their offspring to deal with agriculture, the majority of householders who explained their position by saying that there is no prospect in agriculture and that it is a difficult and unprofitable and unsafe job. It is important to note at this point that based on the value of c2 test ($c2 = 29.448$; $p = 0.000$) and the calculated value of the coefficient of contingency ($C = 0.308$), it can be concluded that there is a high statistically significant and moderate dependence of the expressed desire for children to be engaged in agriculture and the intentions of householders to improve agricultural production on their farm in the near future. So there are more householders who intend to invest in agriculture among those who at the same time want their children to deal with agriculture.

Table 6. The number of children in the family (%)

Number of children	One	Two	Three	Four and more	No children	Total
Frequency	41	176	30	7	27	281
Percent	14,6	62,2	10,7	2,5	9,6	100

Source: Authors' calculations

There is no statistically significant relationship between the desire for children to deal with agriculture and the type of farm they live on (c2 = 2.896; p = 0.235). However, Man-Whitney's test showed that there was a statistically significant relationship between the variables of the assessment of the economic position, on the one hand, and the desire for children to deal with agriculture (U = 6797; z = -3,207; p = 0,001; r = 0,191) on the other side. Thus, it is much more common for householders who estimate the economic position of the household as very good and good and desirable future of their children for agriculture. However, according to Cohen's criterion, the impact of the assessment of the economic position and prospects for children in agriculture is small.

Gender division of labor in the household

For a long time the rural family functioned as a working community in which they knew exactly what were male and female tasks and duties. It was hard to see a man who wants to clean the yard, to milk a cow or do home duties, while on the other hand, women were less ashamed to do "male" jobs (Vukosaljević, 1983). Women generally worked less hard work, and jobs that did not require professional training. So they were mostly related to the house: they prepared food, guarded children, weaved, and so on. In addition to the gender division of labor, in Serbian traditional society there was a division of labor according to age.

The modernization of agriculture has largely altered the traditional gender division of labor. Today, most male jobs can also be female ones. The greater participation of women's workforce in agriculture was also due to the migration of male labor force towards the city. The employment of men outside the holding required an increased involvement of the woman in the household (Stojanov, 1989), which additionally burdened the rural woman and increased her importance on the farm, since she took on many traditional men's jobs. In addition, it should be kept in mind that this additional work in agriculture was more a consequence of necessity than its choice, and also the employment of women themselves is considered one of the main factors of changes that have taken place in the family and family relations (Novakov, 2011a).

At the level of our sample, the highest levels of engagement in agriculture have household keepers (59.4%), while 36.7% of respondents answered that all members of the family are engaged. On the other hand, when it comes to doing housework - the wives are in charge of them. The research on the socio-economic status of women with the status of "assistant member in the household" that was conducted in 2008 (Babović, Vukovic, 2009) showed that men have the dominant power in deciding on agricultural production, while women are left with home and home-related decisions tasks. So, at the level of our sample, females are in 69.8% of cases in charge of cooking, and only 5.1% answered that men and women are involved in the preparation of food. Women are in 74% of the families in charge and for ironing (only 3.2% of respondents participate together with their wives), and for cleansing 70.8% (together with husband 5.7%). The greater involvement of the husband is noticeable only in the care of children, where mother is also predominant (52.7%), and more often fathers are engaged with their

mother (24.2%). Another area of day-to-day engagement in which common activity is noticeable is the procurement of foodstuffs: women themselves make purchases in 60.1% of families and in 16% with their husbands. Most householders (77.8%) stated that they never perform any housework or some of them (cooking, washing, ironing ...), while only 17.4% answered that there is no such job that they never engage in. These jobs are in 59.8% of cases performed by wives. Therefore, there is a division of labor in the household today. Thus, 75.1% of householders stated that there are jobs in which wives do not participate on their farms. These are: all the field jobs in agriculture (26%), jobs with and regarding mechanization (13.2%), heavy physical work and field work (8.2%), land treatment (6.4%), crop production jobs (4.6%), plowing (2.1%) and others. These are also the jobs that householders consider typical for male jobs in agriculture. On the other hand (18.5%) of the respondents stated that there are typical female jobs in agriculture, such as vegetable growing, gardening and greenhouse work, milking, floristry, and cattle jobs.

Constant participation in agricultural works is somewhat more prevalent among older women in the household, than in younger ones (Table 7). So, approximately one in four old women (27.4%) always participate in agricultural work, and 19.6% younger women. In doing so, elderly women are most often involved in cattle jobs, then, as the householders answered "in everything that is needed", in the maize storage and vegetable production. Younger women are also most often involved in cattle jobs, vegetable farming, all work and manual corn storage activities.

Table 7. Participation of women in agricultural work

Do they participate in agricultural work	Older women	Younger women
always	27,4	19,6
sometimes	16,4	13,9
only during the season	12,5	9,3
rarely	7,5	5,3
never	21,4	20,3
there are no such members in household	10,0	14,2
no answer	5,0	17,4
Total	100,0	100,0

Source: Authors' calculations

Only each twelfth respondent (8.2%) answered that there are jobs in their household that are *shameful* for a man to do, and that these are primarily all housework or some of them. So it's about the so-called "female" jobs. Based on these results, it can be said that the rural population's attitudes evolved, but the practices remained largely the same.

In Serbian traditional society, joint and collective works were one of the important ways of doing agricultural works when they were on religious holy days, and in general. Characteristic of our region was, above all, the custom of the "*moba*" (joint work for an interest of one family, without money compensation). Moba was called for urgent work. The main moba works are mowing, harvesting, digging, picking.

And fruit harvesting was often done using the moba. Moths are primarily organized for crop production activities. In addition, there are mobas that do not serve for the agricultural production. These include moba for building houses and other buildings, for wood cutting, help with bricks and other materials transport. This folk tradition has an important role in women's home work, usually called "*prelo*" (wool spinning). Most people invited for the moba are relatives, neighbors and good friends. Mobas are most often convened in summer and autumn (which does not apply to prela) and in saints, on less important religious holidays, when peasants are not allowed to work for them because it is a sin. On the other hand, it is considered that there is no sin in work if it helps others (Vlajinac, 1929: 433).

How much is the traditional type of assistance among rural population occurs at the local level today is seen just on the case of keeping the tradition of moba (Table 8).

Table 8. The presence of "*moba*" - joint work

Help	In some agricultural works	Building houses or similar	Preparation of celebration	In doing some casual jobs
Yes	44,5	29,9	42,0	50,9
Sometimes	33,8	25,6	25,3	18,5
No	20,6	43,4	31,0	29,9
No answer	1,1	1,1	1,8	0,7
Total	100,00	100,0	100,0	100,0

Source: Authors' calculations

It turned out that the help that neighbors, friends, relatives provide to a householder without money compensation, is most prominent precisely when performing agricultural works, as well as assistance especially among women when preparing some important celebrations in the life of a rural family (Table 8). And mobas that do not serve agricultural production, but are organized when building houses or similar, have remained in the present time.

Conclusion

The two basic traditional values in all peasant societies are the value of the land and the value of the family. The family replaces those groups and institutions that do not exist in the village, but are present only in the urban areas, thus representing a prototype for all other social communities. In rural areas there is a family organization of economy, family housing, socialization of children, and all cultural patterns in the village bear a sign of family relations (Mitrović, 1998: 295). The family is the basic framework of social life in a village where the primary family and family/relatives connection has not been lost to the present. Nonetheless, the rural family, viewed from a historical perspective, suffered great changes. One of them is the size of the family group. Thus, the most common type of family in selected farms – family made up of parents and children, while only every third family was extended/enlarged family. A large number of children are not any more the characteristic of the rural environment.

On the other hand, high marriage rate is still a feature of Serbian rural areas, with the difference that the age of marriage was moved to a later year of the marital contingent, but nevertheless remained below the average for Serbia. In addition to the fact that agricultural holdings are not usually registered on women, the power to decide on agricultural production has been kept in the hands of men by keeping the patriarchal pattern. Thus, women do not usually decide on agricultural production, although they are included in it. However, the house is (remained) a woman's sphere: housework, household and children care are almost entirely entitled to women. The above findings point to another conclusion: the gender division of labor persists in Serbian village, but also solidarity and support from traditional resource groups such as neighbors, relatives and friends in performing agricultural and some other works. The survival of traditional values is something that must be considered when it comes to the socialization of children with whom they are transferred to younger generations, since, among other things, they will depend on the commitment of these generations to continue cultivating agriculture and to live in the rural areas

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Conflict of interests

The authors declare no conflict of interest.

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ECONOMIC ASPECTS OF DRIED FRUIT PRODUCTION BY COMBINED TECHNOLOGY

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A B S T R A C T

The aim of the paper is to evaluate the level of profitability of dried fruit production by combined technology (osmotic and convective). In the focus of the research is small capacity dryer - 500 kg of fresh fruit per day, which is used on agricultural holding. The costs of fresh fruit are the most important item in the structure of the price of all types of fruit (67.1% on average), followed by labor costs (14.0%) and packaging (6.8%), while the share of energy is very modest (2.74%). Comparative analysis shows that, individually, the most cost-effective is dried pears production. For 120 days of effective operation of the dryer, profit of 9,815 € is realized, with an acceptable degree of coefficient of economic efficiency (1.21). Investment in construction of drier (31,900 €) is paid in 2.74 years. It is a profitable business, which can be a good source of income for agricultural holdings.

Introduction

The Republic of Serbia (RS) has very favorable conditions for the development of fruit production. In addition to quality soil and favorable climatic conditions, there are also very respectable human, technical, technological and market potentials for raising production and processing of fruit to a significantly higher level. However, despite visible shifts in recent years, the available potentials have not been sufficiently utilized. There are numerous reasons, from the unfavorable economic environment that has been present for several decades, to inadequate measures of agrarian policy in the field of investments and current subsidies. Raising new intensive fruit plantations, or processing capacities, require significant

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investment funds as well as current investments, which our traditional producers are not able to finance without well-organized institutional support. This support has been more serious in recent years, as seen through the raising of quality orchards, and more fruit processing plants.

Fruit production requires a significantly higher investment of all production factors than other branches of agriculture, especially human labor, whose availability may appear as a limiting factor. In addition, planting takes years to complete, so the risks are much higher (Lukač Bulatović et al., 2017).

An important precondition for increasing fruit production is the existence, growth and development of fruit processing capacities. Lukač Bulatović et al. (2012) points out that only about 10% of the total quantity of fruit produced is processed in Serbia. Observing the example of the United States, where up to 45% of the produced apples are processed, and as much as 70% of the produced plums, it can be said that fruit processing in the RS is at a low level. The fact is that the products of the higher technological level of processing carry a higher added value, that is, they provide higher profits. Therefore, it is necessary to pay more attention to all types of fruit processing, especially those that are less represented.

The processing of fresh fruit in Serbia is mainly focused on: freezing (rolend and block), juices, compotes, gelatinized products, marmalades and alcoholic beverages. In recent years, dried fruit has become very attractive, both in application in certain food forms and in scientific research. Drying of fruits, with the exception of plums, is at a low level in our country (Milić et al., 2006). The reasons are: lack of tradition, insufficient knowledge of technologies for drying other fruits, product unrecognizable to domestic customers, slow conquest of foreign markets, etc.

The development of new fruit drying technologies in the world is accompanied by certain economic results which affirm the fruit drying industry as a significant business sector. The Food and Agriculture Organization of the United Nations (FAO - OUN) suggests improving the fruit drying industry in all parts of the world. Considering the potential for fruit production in Serbia, the development of new drying technologies is of particular importance.

In the world, in 2017, about 2.8 million tons of dry fruit was produced, which is 16% more than the average production in the period from 2008 to 2017. The highest increase in production in the past decade was recorded in dry apricot production - as much as 40% compared to the 10-year average. The world's leading manufacturers are Turkey with 19% of the world's total production and the US with 12% (Source: www.nutfruit.org).

There is no precise data on the production and consumption of dry fruit in Serbia, but positive trends in recent years can be noticed. Dried fruits from imports are increasingly substituted with dry fruit from domestic production. The export of nuts and dried fruit from Serbia to the market of the countries of the European Union and other developed countries amounted to about 5.2 thousand tons in 2017, which is at the level of the ten-year average (2008-2017). Compared to the previous year, exports decreased by 3.7%, but it increased

by 16.4% compared to 2008 (Source: Authors' calculation based on data from Statistical Office of the Republic of Serbia - RZS).

Import of nuts and dried fruits in the RS in 2017 was about 500 tons, which is 15.4% more than in the previous year, but 11% less than in 2008. Observed in value, in 2017, nuts and dry fruits were imported by approximately 1.4 million US $, an increase of 10.5% compared to the previous year, ie a decrease of 42.5% compared to 2008 (Source: Calculation of authors based on data from RZS).

It is clear that there are basic preconditions and significant space for increasing the production of dried fruit in RS. The subject of the research in this paper are the technological, organizational and economical aspects of dried fruit processing in Serbia. The research includes the following fruit varieties: apricot, peach, pear, apple, quince, raspberries and blueberries. The aim of the research is to determine the level of profitability of the production of dried fruit in driers with a capacity of up to 500 kg of fresh fruit per day.

Materials and methods

Research in this paper respects the real production, technological and economic conditions of business in Serbia. Economic calculations and analyzes are based on the laboratory established and in practice confirmed norms of material, labor and energy consumption. Experimental research has been carried out for a number of years in the Laboratory for Biosystem Engineering at the Faculty of Agriculture in Novi Sad, within the national Project TR31058. Original devices and technological methods for drying fruits with conventional (convective) and combined technology (osmotic and convective) have been developed. Dryers based on this technology have been successfully working in practice for many years.

The economic aspects of the production of dried fruit are considered continuously from 2010 within the mentioned project, which was published in several individual papers (Vukoje, Milić, 2011; Vukoje, Pavkov, 2010, 2015; Vukoje et al., 2010; 2011, 2013; 2017). In this paper, the author take into account the corrections of the technological parameters that occurred in experimental research, with the integration of more production for the purposes of comparative analysis of cost-effectiveness and estimation of justification of investments in fruit drying plants (apricot, peach, pear, quince, apple, american blueberries and raspberries).

The survey relates to a small capacity plant that is suitable for production on family farm. In addition to the analysis of operating costs and outputs achieved in individual production, research also includes the cost-effectiveness of investment in raising fruit drying plants on agricultural holdings. The plant is used efficiently annually for 120 days, of which apricot dries for 20 days, peach and pear for 30 days, and apple, quince, raspberry and american blueberries for 10 days.

The drying capacity is 500 kg of fresh fruit per day, ie 60 tons for 120 of effective work. Fresh fruit is bought in the surrounding market, which means that it is not necessary

to have refrigerator for fruit keeping. Calculations of costs and outcomes are based on real market prices at the end of 2017, ie the average exchange rate of the euro from the observed period (1 € = 118 RSD). The results of the survey are expressed in euros to obtain a clearer picture and easier comparability of the data. The agricultural holding on which the production takes place is not in the VAT system.

The analysis of economic indicators is based primarily on analytical calculations of drying of certain types of fruit. Direct costs are primarily calculated for daily production, followed by calculations for the number of days of drying certain fruit types. In order to reliably estimate the cost-effectiveness of fruit drying, it is also necessary to determine additional indicators of success (cost-effectiveness and accumulation, income, return time of investment). In addition to the use of percentages and coefficients, a comparative analysis of the cost-effectiveness of individual production requires the reduction of the basic indicators of success in the unit of capacity, for which in this case it is most appropriate to take a "one drying working day", since the daily capacity is the same for all fruits (500 kg/day). The basic hypothesis of this research is: drying of the researched fruit species by the described technology in small driers with capacity up to 500 kg is profitable.

Results and Discussion

The results of research have showed that drying fruit with combined technology (osmotically and convectively) has significant advantages over conventional drying processes. The performed laboratory research showed that this technology, primarily due to osmotic drying, has a favorable effect on the preservation of the mechanical, visual and nutritional properties of this product (Babić et al., 2006). The combined drying technology has clearly separated drying stages: preparation of fresh fruit, osmotic drying, convective drying and packaging (Figure 1**.**). There are also certain specificities in the technological process for certain types of fruit, to which all phases of drying are not applied. This primarily refers to raspberries and blueberries, which do not pass the osmotic drying phase, which is explained in detail below.

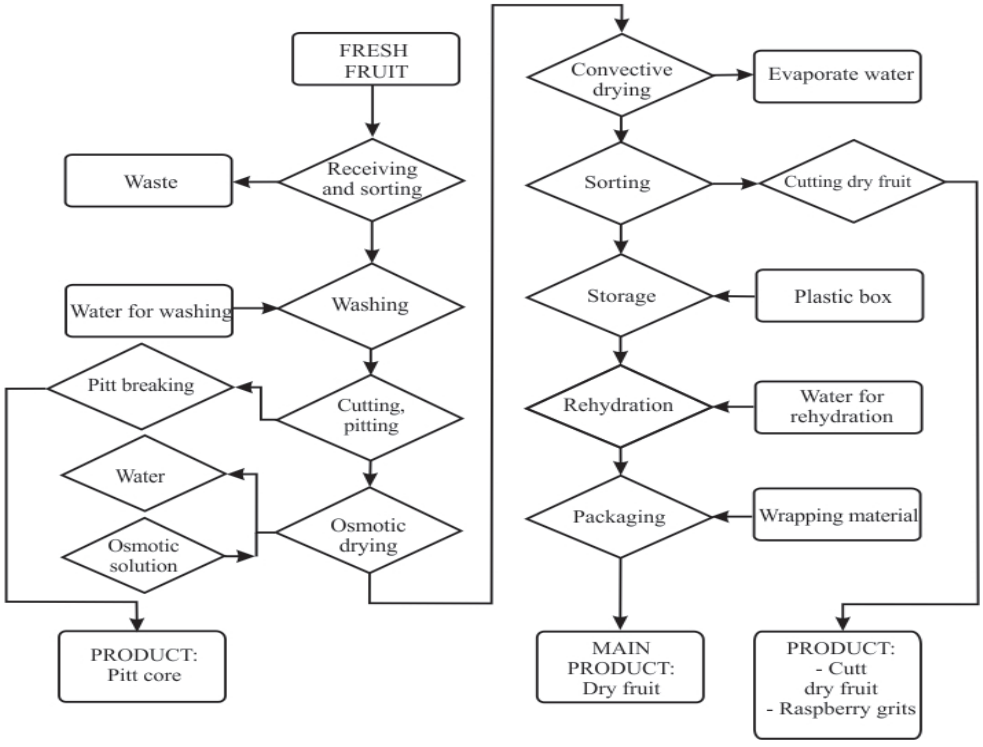
Preparation of fruit for drying involves receiving and sorting of fruit according to the stage of maturity, dimensions, shape and color. Fresh fruit that does not meet the set criteria is separated and sent to other forms of processing (waste, Figure 1.). After washing, depending on the fruit type further steps follows. Apricot is cut into halves and the kernels are separated. The apricot kernel is broken and the soft part is extracted which represents an additional product. In peach, the fruit size determines the shape of the cut. The fruits are cut along the longitudinal fruit furrow, the kernel is separated, and the hemispheres are cut into four, six or eight parts (Pavkov, 2012). The fresh pear is cut along the longitudinal axis of the fruit, then the seeds are separated and depending on the size of the fresh fruit it is cut into four six or eight parts (the thickness of the slice up to 40 mm) (Pavkov, 2012).

Preparation of quince and apple consists of peeling, separation of the seed house, then cutting to slices or cubes (Pavkov et al., 2008). For all fruits that are cut before drying,

it is very important to get the maximally uniform parts. American blueberries and raspberries are dried in whole fruits shape (Pavkov et al., 2017).

Cut out fruit is a subject to rapid oxidation, or color change. In order to retain natural color, an antioxidant treatment is performed. Apricot, peach, pear and quince are exposed to sulfur dioxide in the sulfur storage chamber (Pavkov et al., 2009; 2011; Radojčin et al., 2010; 2015). The operation lasts from one to two hours in a hermetic chamber where technical sulfur powder is burned in a ratio of <1 g per kilogram of prepared fruit. The length of exposure depends on the stage of maturity. The cut apple is immersed in a solution of water and ascorbic acid at a concentration of 0.5% for 3 minutes. American blueberries and raspberries have a dark pericarp color that is not susceptible to intense oxidation as in the other fruit species analyzed, so they are not treated (Pavkov et al., 2017).

Figure 1. Technological scheme for fruit drying



Source: Authors

The fruit prepared according to mentioned procedure is ready for drying. A favorable influence on the quality of the final product in apricot, peach, pear, quince and apples has an osmotic drying (İspir, Toğrul, 2009, Sette et al., 2016). By submerging prepared fruit into concentrated sugar and water concentrations at a concentration of 50-65% at a temperature of 50° C, the effect of osmotic pressure is produced, which causes the transition of water from the fruit to the solution (drying) and the transition of the

solvent to the surface parts of the fruit. The intensity of this exchange is conditioned by the concentration and temperature of the solution, as well as the exposure time. Various sugars, sucrose (crystal sugar), glucose fructose syrup, sorbitol, mannitol, etc. are used for the osmotic solution. In this paper, fructose syrup was used at a concentration of 60% at a temperature of 50° C and the duration of the osmotic drying was 1 h. During osmotic drying, the average humidity reduction is 7%, with a dry matter increase of 3.5% compared to the initial values of the prepared fruit. This procedure produces the effect of mild sweetening, as well as the repair of a sweet-sour relation, which significantly affects the sensory properties of the end product. In addition, dry matter that has escaped from the solution into fruit influences the reduction of aw-value, a positive impact on the storage properties of dry fruit. Osmotic drying is not applied to raspberry and American blueberries.

After osmotic drying, the fruit is transferred to convection dryer where the air is heated at 65° C temperature. The duration of drying depends on a large number of factors (air temperature for drying, air velocities within the chamber, fruit size, maturity stages, etc.). Within this work, drying time for all fruit species is 12 h. During this time, apricot, peach, pear and quince are dried to a humidity of 24% which is safe for storage. The American blueberry is dried to 20% and raspberry to 6%. Usually raspberries are dried by freezing (lyophilization), which is the best way of drying. However, investments in such plants are very significant. An alternative is drying with heated air where a product of lower quality is obtained (darker colors, smaller dimensions, reduced c-vitamin content due to decomposition), but still interesting to the end customer. Within this paper, raspberries are dried by air (Pavkov et al., 2017, Bon et al., 2007).

After drying, selection of dried fruit is done. Fruit that is not sufficiently dried, inadequate in color, with visible dark spots is distinguished and then it is cut into dice that will be used as a supplement (muesli, fruit blocks, confectionery products). With raspberries, the damaged fruits are separated and semolina is made from dried raspberries. Selected dry fruit is packed in plastic boxes and placed in a storage room with controlled temperature and moisture (<18° C, <60%). American blueberries are sip into the water solution and fructose syrup concentration of 5% at a temperature of 70° C for 3 minutes (rehydration) before sale packaging.

The analysis of the profitability of future business starts from the estimated market potentials and investment value. According to the research by Vukoje and Milić (2011), the raising of the dryer on the agricultural holding requires an investment of 31,900 €, revised to 2017. It is assumed that there is already a part of the facilities and infrastructure that can be adapted and used on the farm.

The calculation of costs and results started from the mass balance of certain types of fruit, which are the result of experimental research and experience norms from practice (Table 1.). Based on daily balances, calculations were made for the estimated number of days of drying each type of fruit. For most products, two main products appear: (a) dry fruits I - represent dry quarters/halves (apricot, peach, pear, apple and quince) or dried fruit (raspberries and

blueberries), and (b) dry fruit II - which occurs in the form of dry cubes, with the exception of raspberry, which is a dry bite. The side product appears only in apricot, in the form of a dry core used in the confectionery industry and has a significant value.

Within the "waste" position, all types of waste that occur in the process of preparing drying fruits (poor quality fruits, stones, house seeds, etc.) are included. There is a possibility that one of the abovementioned waste is used, for example, for making brandy, feeding the livestock, etc., but this has not been taken into account in this paper, since it is relatively small and uncertain benefits.

Table 1. Mass balances of drying of certain types of fruit (kg/day)

Products	**Apricot**	**Peach**	**Pear**	**Apple**	**Quince**	**Raspberry**	**Blueberry**	**TOTAL**
Dried fruit I	75.0	75.0	95.0	75.0	90.0	50.0	70.0	530
Dried fruit II	10.0	10.0	15.0	10.0	10.0	10.0	0.0	65.0
Side product	3.9	0.0	0.0	0.0	0.0	0.0	0.0	3.9
Waste	42.4	50.0	40.0	60.0	65.0	0.0	0.0	257
Evaporated water	368.8	365.0	350.0	355.0	335.0	440.0	430.0	2,644
Fresh fruit (Σ)	**500**	**500**	**500**	**500**	**500**	**500**	**500**	**3.500**
Number of drying days	20	30	30	10	10	10	10	120
Total fresh fruit	10,000	15,000	15,000	5,000	5,000	5,000	5,000	60,000
Total dry fruit	1,700	2,550	3,300	850	1,000	600	700	10,700

Source: Authors' calculations

The results of the research have shown that in the structure of the total cost of dried fruit production, fresh fruit dominates, as a basic raw material, on average with 67.1% (Table 2, Figure 2.). However, there are significant differences between individual production (51.9% in apples, up to 82.8% in raspberries and 83.5% in blueberries), which is primarily due to differences in the price of fresh fruit. Such large variations in the participation of fresh fruit (as a convincingly most significant cost) results in significant ranges in the relative share of other costs in certain production (work, energy, other materials and fixed costs). This may lead to incorrect conclusions on the structure of total costs, since the amount of these costs is very close to the unit of capacity for all observed production (one day of drying, or one kilogram of processed fresh fruit).

Labor costs were also relatively significant (averaging 14.0%), which, among other things, can be explained by the relatively low automation of technological processes, special in the first stage of "fodder preparation" for drying. Of the "other materials" the most important are the packaging costs (average 6.8%), the amount of which depends on the quantity of finished products and the size of the packaging. Products with a higher share of dry fruits in the mass balance (apricot, peach, pear, apple and quince) are packed mainly in larger packages (200-400 g), and raspberries and blueberries into smaller packages (50-200 g), with mixes that contain different types of fruits.

The total energy costs (thermal and electrical combined) were relatively low and make up, on average, about 2.74% of the total cost. The heat demand for fruit drying depends on the physical and thermophysical properties of dried fruits and the technical characteristics of the dryer. In this case, it is a wood dryer in which the

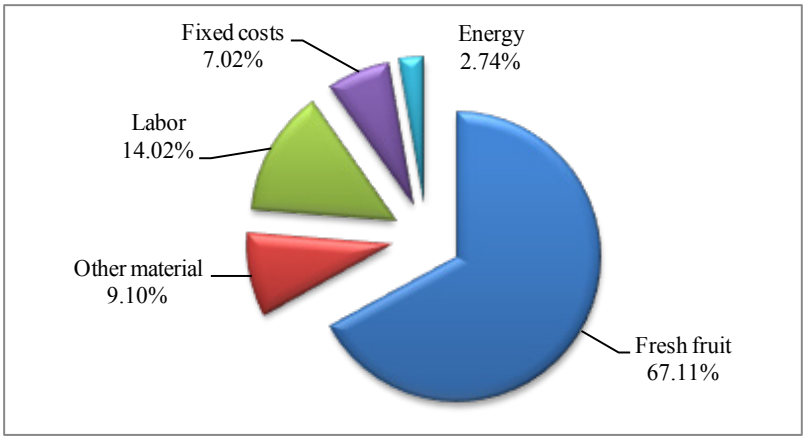
Table 2. Calculation of the production of certain types of dried fruit (in €)

No	COSTS	Apricot	Peach	Pear	Apple	Quince	Raspberry	Blueberry	TOTAL
		20 days	30 days	30 days	10 days	10 days	10 days	10 days	120 days
1	Fresh fruits	3,475	5,085	7,627	1,398	2,331	5,720	6,356	31,992
2	Sugar / Syrup *	192	288	288	96	96	0	13	971
3	Water	19	29	29	10	10	5	10	111
4	Packaging and other	458	704	885	230	276	324	378	3,257
I	**Material**	**4,144**	**6,106**	**8,829**	**1,733**	**2,712**	**6,049**	**6,757**	**36,330**
5	Electricity	73	109	114	36	43	9	19	403
6	Thermal energy (straw)	127	190	199	63	68	111	94	852
7	Labor	1,153	1.729	1,729	576	576	461	461	6,685
A)	**Variable costs (1 to 7)**	**5,496**	**8,133**	**10,871**	**2,409**	**3,399**	**6,630**	**7,331**	**44,269**
8	Depreciation and maintenance	353	529	529	176	176	176	176	2,118
9	General expenses	205	308	308	103	103	103	103	1,230
B)	**Total costs (1 to 9)**	**6,054**	**8,970**	**11,707**	**2,688**	**3,678**	**6,909**	**7,610**	**47,617**
10	Main product I	6,483	9,725	13,767	2,860	4,271	7,203	8,720	53,030
11	Main product II	692	1,037	1,304	305	237	720	0	4,296
12	Side product	156	0	0	0	0	0	0	156
C)	**VALUE OF PRODUCTION (10 to 12)**	**7,331**	**10,762**	**15,071**	**3,165**	**4,508**	**7,924**	**8,720**	**57,481**
D)	**PROFIT (C - B)**	**1,277**	**1,792**	**3,364**	**477**	**830**	**1,014**	**1,111**	**9,865**
13	Economy (C / B)	1.21	1.20	1.29	1.18	1.23	1.15	1.15	1.21
14	Accumulation (D / C) x100	17.4%	16.6%	22.3%	15.1%	18.4%	12.8%	12.7%	17.2%

Source: Authors' calculations

convective drying phase is carried out, characterized by a specific heat consumption of about q=6000 kJ/kg of water that needs to be brought to dry the fruit. As a fuel for combustion, wheat straw is used for the mean values of lower heat output Hd=13,000 kJ/kg. Electricity is used for the operation of pumps, fans, heaters for osmotic drying and lighting. The average constant power input is about 2 kW for 24 hours.

Figure 2. Structure of the cost of production of dried fruit (in %)



Source: Authors' calculations

The reasons for this modest share of energy costs (2.74%) are found in the relatively low electricity price in Serbia, as well as the use of straw for obtaining thermal energy, which is considerably cheaper than other fuels. Contrary to popularity, once again it is confirmed that energy costs are not crucial for the cost-effectiveness of dried fruit production. There is also a question of justification of the replacement of straw with natural gas, which is technically and organizationally considerably more favorable fuel. The equivalent quantity of natural gas is 8.696 m^3 for 120 days of drying operation, which at an average price of 48.3 din/m^3 amounts to 3,560 € in 120 days. With the use of gas instead of straw, energy costs increase by 2,708 € annually and reach a relatively significant share in total costs of 7.97%. The profit is reduced by a significant 27.6%, which seriously brings into question the cost-effectiveness of dried fruit production. On the other hand, the possible increase in electricity prices, which can reasonably be expected in the upcoming period, does not significantly affect the cost-effectiveness of production, given the low consumption of this energy (0.95% of total costs).

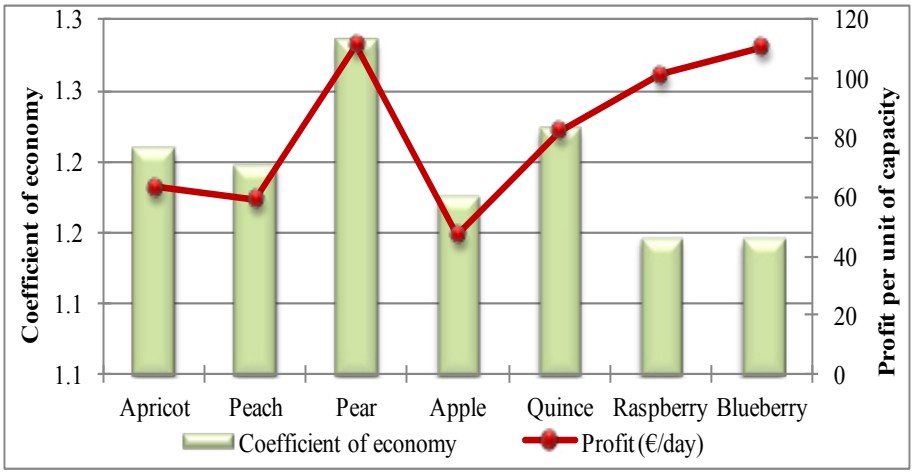
Fixed costs accounted for 7.02% of total costs, which represents a relatively significant percentage. Of this, 4.44% refers to depreciation and amortization, and 2.58% to the general expenses of the holding. General costs generally include overheads of the farm (telephone, fuel and travel expenses, insurance, taxes and contributions, administrative services, eventual sales costs, etc.). Fixed costs are determined on an annual basis and then allocated to individual production in proportion to the number of days of drying, or used capacity. Since this is a linear distribution of fixed costs, there is no significant difference in the margins of coverage and profit.

The highest costs per unit of capacity (one day of drying) was required by the production of american blueberries (761.20 €) and raspberries (691.05 €), while the lowest investments in apple production (269.29 €) and peaches (299.46 €). Such large differences are due, above all, to the already mentioned differences in the prices of fresh fruit, since the other costs are very close to the unit of capacity. If we add significant differences in mass balance, then large variations in the price of finished products with a range of up to 3.6 times (raspberry 11.52 €/kg, blueberry 10.87 €/kg, quince 3.68 €/kg, pear 3.55 €/kg, peach 3.52 €/kg, apricot 3.47 €/kg and apple 3.17 €/kg) do not surprise. On the basis of the total annual costs and the total amount of dry fruit, the average cost of the main products was 4.44 €/kg, which in this case represents only the calculated size.

The average wholesale price of dry fruit amountes to 5.36 €/kg, along with large differences between the highest blueberries (12.46 €/kg) and the lowest apple (3.72 €/kg). When VAT is calculated (20%) and the average trade margin (15%) retail prices for dried fruit is calculated (raspberries 18.22 €/kg, blueberry 17.19 €/kg, pear 6.30 €/kg , quince 6.22 €/kg, peach and apricot 5.82 €/kg and apple 5.14 €/kg), which are very competitive on the domestic and foreign market, especially when considering the relation of price and quality. Various mixes of different types of fruit are often packaged together, for which the average selling prices are determined.

The highest production value per unit of capacity (working day) was realized in the production of blueberries (872.4 €) and raspberries (792.0 €), and the lowest in apple (316.5 €) and peach production (358.7 €). The order is practically the same as for the total cost. However, the highest **profit** per unit of capacity is achieved in pear production (111.7 €), followed by blueberries (110.8 €) and raspberries (101.3 €), while apple (872.4 €) and peach are least profitable (872.4 €) (Figure 3.).

Figure 3. Economics and profit per unit of capacity (€/day)



Source: Authors' calculations

According to the criterion of economy, the most favorable relation between production and cost is also achieved in pear production (1.29), followed by quince (1.22) and apricot (1.21), while blueberries and raspberries (1.15) are the worst. The same sequence shows the profitability indicator of production, which is logical, since it is a similar type of indicator (Table 2, Figure 3.).

We see that the two basic criteria (profit per unit of capacity and economy) show a very different order of profitability for observed production. The question which criterion to prioritize arises? The answer to this question, in each specific case, requires deeper analysis with the inclusion of additional criteria (market, production, organizational, financial). Generally speaking, one should take into account what is the key limiting factor of maximizing the overall profit of the dryer. If the financial resources available to the household are, then the most important is the economy, because one RSD of investment earns the highest salary. In contrast, if the farm does not have restrictions on financing the production, but it is the effective capacity of the dryer during the year, priority should be given to those products that reject the highest earnings per day of the operation of the dryer, as the overall profit will be the highest.

The total annual profit of dryers, ie 120 days of effective work was 9,815 € (Table 2.). This can be considered a good income, especially if it is a supplementary activity in the agricultural holding. The coefficient of economy (1.21) and the production accumulation rate (17.1%) are also at a satisfactory level. If two members of the household are employed (out of a total of 5 required workers), earnings can be expressed in the form of "income" of the farm, which amounts to 12,488 €.

In addition to a comparative analysis of the profitability of drying certain types of fruits, that is, the annual net yield of dryers, it is important to consider the justification of the total investment project for the construction of a plant for drying fruits in the agricultural holding. The most important indicator of the return on investment is the return on investment (Table 3.). In this case, the funds invested are returned for 2.74 years, which is a relatively short repayment period, especially for this type of investment. The rate of return on investment is at a high level (30.8%), bearing in mind that it exceeds the average values of interest rates in several ways.

Table 3. Basic indicators of cost-effectiveness of the investment (in €)

No	TYPE OF INDICATOR	€/ year
1	Total profit	9,815
2	Depreciation on annual basis	1,818
3	Financial flow (1+2)	11,632
4	Total investment value (€)	31,900
5	Time of return on investment (4/3)	**2.74**
6	Profitability of the investment (1/4)	**30.8%**

Source: Authors' calculations

Sensitive analysis in this case has a limited value, since it is based on the average prices of the observed types of fresh and dried fruit. The net financial result becomes negative with the increase in the average market price of fresh fruit by 31%. Profitability is considerably more sensitive to the decrease in the average selling price of finished products, and already with 17% decrease drier is in loss.

Conclusion

The results of the study show that the drying of the analyzed fruit species represents cost-effective production in the described conditions. This proved the established hypothesis of research. Medium capacity drier for 120 days of effective production yields a profit of 9,815 €, with an acceptable coefficient of economy (1.21) and production accumulation (17.1%). An additional benefit for the household can be achieved by hiring family members in the fruit drying process. There are significant differences in the level of profitability of drying of certain types of fruit, which mainly arise from the differences in prices of fresh fruit, which is a key factor for the profitability of this production. The partial use of fresh fruit from its own production significantly reduces costs and increases the profitability of dryers.

The construction of a plant for drying fruits on a family farm does not require large investment (31,900 €), which are repaid in 2.74 years. It is obvious that this is a viable business venture, which can be a good source of income for agricultural holdings. The development of small and medium-sized enterprises in agriculture can be largely achieved in the domain of fruit drying. The Republic of Serbia has great chances for increasing the export of dry fruit, bearing in mind the constant increase of consumption of this product in the world.

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Conflict of interests

The authors declare no conflict of interest.

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IMPACT OF EU REGIONAL POLICY ON THE DEVELOPMENT OF CROSS-BORDER COOPERATION OF AP VOJVODINA AND POSSIBILITIES OF USE OF THE PRE-ACCESSION ASSISTANCE

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A B S T R A C T

The paper analyses the practical application of pre-accession funds in the function of regional development, in the case of development of cross-border cooperation of AP Vojvodina in the period 2007-2013. The results obtained point to the fact that the districts in AP Vojvodina are with the most attracted assets and applicants in the period of IPA programme implementation: South Bačka district (cross-border cooperation - Hungary and Serbia) and South Banat district (cross-border cooperation - Romania and Serbia); that most assets and most projects were realised in cross-border cooperation between Hungary and Serbia; that the participation of realised assets in AP Vojvodina are the following: Hungary - Serbia: 27,35%; Romania - Serbia: 12,98%; Croatia - Serbia: 1,64%; Bosnia and Herzegovina - Serbia: 0,21%. Within the conclusion, an overview was made of the possibilities of the use of IPA II programme for the period 2014-2020 by AP Vojvodina.

Introduction

The European Union's regional policy, according to the prevailing opinion, is one of the most important common EU policies. In the context of the argumentation of this paragraph, primarily stated is the focus of the objectives of the EU regional policy towards cohesion and solidarity with the aim of improvement of economic state of the poorer EU Member States, as well as the commitment to the development of innovation and competitiveness, modernisation, improvement of educational activities,

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environmental protection and other strategically important areas. In other words, the definition of EU regional policy is the reduction of economic and social differences between the EU Member States by systematic and planned incentives for regional development, in continuity.

In the context of the above, certain authors point out that, when considering the positive aspects of the implementation of the EU regional policy concept "it should be borne in mind that it is not only about the regional development in the narrow sense of the word, but also about the effort to achieve the a connection at the European Union level by reducing the existing differences in the development level between its regions" (Mirić, 2009). Referring to this view, it is necessary to make a quick overview of the concepts of regionalism and regionalisation and to point out to the ambiguity and the important elements of distinction of both concepts in relation to the concept of EU regional policy.

Citing numerous manifestations of regionalisation, with different political, administrative, legal or economic characteristics, and the aspect of decentralisation as the basic characteristic of regionalism as a political concept and projection, Golić and Počuča (2017) emphasize the fact that political-territorial autonomy, as one of its manifestations, means the specificity of a certain part of the territory valued through its own (mainly asymmetrical) jurisdictions, revenues and organisation. In theory, the concept of regionalism, as a political projections or a programme, is defined as "advocating for such forms of government that allow and encourage the development of culture and institutions within a region with special jurisdiction and that include the transfer of essential political and legal competencies to regional authorities, with less than full sovereignty, but more than mere administrative functions" (Komšić, 2007). In this context, Kačar et al. (2016) state that the development of a narrower territorial entity is a complex issue, which, in addition to economic development policy, also includes issues in the field of agriculture, local infrastructure development policy, as a necessary ambience of local economic development, as well as a wide range of civic initiatives, which also imply numerous positive effects in the field of local community development.

Unlike regionalism, under regionalisation, as a kind of methodological approach and distribution system of competencies and relations in a specific constitutional or administrative system, which aims to establish a special level of government - as a higher level of self-government (e.g. France, Poland, Sweden, the Netherlands) or territorial autonomy throughout the territory (Spain, Italy - the so-called political regionalisation) implies the process of creation or formation of lower administrative-territorial units within the state and transferring a part of state power to these units, where these administrative-territorial units represent the central level of government, between the central government and the municipalities (Vuković, Jovanović, Grubišić, 2012). In a wider sense, the organisation of central authorities at a regional level (deconcentration), economic regionalisation (statistical regions) or inter-municipal regional association, as forms of functional regionalisation, can also be considered as regionalisation. Bearing in mind comparative solutions, it is not possible to determine the existence of a model or standard of organisation of jobs of regional character - regionalisation.

In the context of the distinction between regionalism and regionalisation on the one hand and the concept of regional policy of the European Union on the other hand, it is necessary to emphasise that regionalism and regionalisation are the choice of each individual national regional policy, with reflections primarily at the national level, while the regional policy of the European Union is directed at the supranational level elements, on the continuous systematic and planned incentives for regional development, which has already been mentioned previously.

In the context of the prevalent peculiarities of EU regional policy, the paper will first make a theoretical overview of the objectives and importance of EU regional policy, as well as of the financial instruments for its realisation, and then, within the research work and using the relevant methodology, it shall analyse the practical application of pre-accession funds in the function of regional development, in the case of the development of cross-border cooperation of AP Vojvodina in the period 2007-2013, i.e. in the IPA programme implementation period. Within the conclusion, an overview shall be made of the possibilities of the use of pre-accession assistance for the period 2014-2020, within the IPA II programme.

Literature review

The regional policy of the European Union is also called the EU investment policy, bearing in mind that it represents the basic, i.e. main investment instrument in the process of encouraging regional development and financing of all vital components of the mentioned process. EU regional policy is also called the EU cohesion policy, bearing in mind that its overall objective is to strengthen economic, social and territorial cohesion in the regions.

According to the relevant views, in practice this means that economic and social cohesion involves the processes of stimulating competitive economic growth in the regions, respecting the principles of environmental protection, better employment opportunities, and, in principle, better living conditions, while territorial cohesion involves connecting the region with the aim of innovative and mutually harmonised solving of all concrete and potential challenges, which in principle supports both the regions and the European Union in general (European Commission, 2014).

In theory, in the domain of the purpose and justification of the application of the regional policy of the European Union, it is often stated that, from the very beginning, cohesion policy had a dual role in European policies, which in fact means that it should simultaneously promote regional development, but also be a sort or a source of additional funds for the Member States (Međak, Majstorović, 2004).

EU cohesion policy objectives for the period 2014-2020 were presented in the Strategy for smart, sustainable and inclusive growth, called Europe 2020, which was adopted in 2010 (Europe 2020, 2010).

Analysing the priorities of the Europe 2020 Strategy, Kronja highlights the following objectives of the European Union regional policy: smart growth - development of knowledge-based economy and innovation (scientific and technological research and development, innovation, education and digital society); sustainable growth - simultaneous encouraging of competitiveness and production that is more resource-efficient; inclusive growth - better participation in the labour market, fight against poverty and social cohesion (whereby the basis for the strategy was: "the economic crisis exit plan; confronting global challenges; continuity in implementation - continuation of the Lisbon Strategy, financial support strengthening; better coordination with other EU policies, better division of labour between EU institutions and Member States, new, more efficient mechanisms for implementation and strengthening of competitiveness at the European level. The basic interrelated elements of the new strategy are: three related priority areas, five main quantitative objectives, seven leading initiatives, ten integrated guidelines, a new system of European economic governance, stronger instruments for strategy implementation monitoring, a clear division of responsibilities, relevance for the countries that want to become EU members") (Kronja, 2015).

According to the EU cohesion policy, each member state has, within the framework of their national regional policy, defined quantitative, interrelated and conditioned objectives that they want to achieve for a period of ten years. With the aim of achieving the objectives of the national regional policies, the Europe 2020 Strategy has defined seven specific initiatives within the above mentioned three general objectives of the Strategy, while the EU Council has adopted ten integrated guidelines to ensure the implementation of the objectives of the national regional policies by 2020 (Strategy 2020, 2010).

In line with the presented objectives of the regional policy of the European Union, the theory states that the EU cohesion concept in fact implies "the preparation and implementation of programmes and projects financed primarily from the EU cohesion and structural funds, and it is therefore necessary to emphasise that preparations for the management of this policy in fact involve the preparation for the management of EU funds that are focused on the implementation of strategic plans and priorities defined at both the EU and member state levels" (Mirić, 2014).

When considering the available funds of the European Union, it is necessary to start from the fact that there are three types of EU funds: funds for assistance to EU Member States (the so-called European Structural and Investment Funds), funds to help the candidate countries with integration into the European Union (the so-called pre-accession assistance) and funds for assistance to third countries (e.g. CARDS, TACIS) (Algebra University College, 2017).

Funds for assistance to EU Member States are made up of European Structural and Investment Funds, which include the following funds: European Regional Development Fund - ERDF, European Social Fund - ESF, Cohesion Fund - CF, European Agricultural Fund for Rural Development - EAFRD I European Maritime and Fisheries Fund - EMFF (European Commission, 2017, European Commission, 2011).

Funds for assistance to candidate countries with integration into the European Union (the so-called pre-accession assistance) consisted of a series of programs, up until 2007. As stated in the document called AP Vojvodina Development Program 2014-2020, the European Union has over the course of time developed a whole range of external assistance programmes, of which Serbia has used the CARDS (Community Assistance for Reconstruction, Development and Stabilisation) instrument in the amount of approximately 1.4 billion EUR, in the period 2000-2006. In addition to CARDS, the following financial instruments of the European Union were also available to other countries in the accession process: Phare (Pologne et Hongrie – Aide a Restructuration Economique), ISPA (Instrument for Structural Policies for pre-Accession), SAPARD (Special pre-Accession Assistance for Agriculture and Rural Development) (Group of authors, 2016).

All of the aforementioned programs were replaced in 2007 by one Instrument for Pre-Accession Assistance - IPA programme. Namely, a significant feature of the fifth phase in the regional policy of the European Union (2007-2013) was the unification of pre-accession instruments for assistance to potential member countries. By the European Council Regulation no. 1085/2006, dated 17 July 2006, which entered into force on 1 January 2007, all the previous and previously mentioned instruments have been replaced by an Instrument for Pre-Accession Assistance (IPA), which consists of 5 components and provides a framework for assisting candidate and potential candidate countries (Regional Development, 2017). The aforementioned Framework Agreement in principle defines the general rules for IPA financial assistance and thus defines the direction of work of state authorities at the central and provincial level, as well as of local self-government units. In principle, the purpose of the IPA programme implementation is to prepare the countries for the use of the Structural and Cohesion Funds after gaining membership in the European Union.

The five components of the IPA programme under which assets were allocated in the period up to 2013 are: transition and institution building support, cross-border cooperation, regional development, human resources development and rural development.

The aim of the first IPA component is to provide support in the process of joining the European Union. This component allows a country that is a potential candidate for EU membership to participate in Community Programs and the work of EU agencies. The second IPA component is also targeted at countries in the process of EU accession. The goal of the second IPA component is primarily to encourage further cross-border cooperation with Western Balkan countries, as well as candidates and potential candidates for EU membership.

The basic precondition for using third and fourth IPA components is to gain the status of a candidate for membership in the European Union and to accredit a decentralized EU funds management system. Component III supports infrastructure projects in the sectors of environment, regional competitiveness and transport, while Component IV is a program framework for the use of funds in the sector of employment, education,

social inclusion and integration, as well as strengthening the institutional capacity and efficiency of public administration and public services.

Through the fifth IPA Component, the European Union provides to candidate countries with support in the process of adjusting the agricultural sector and rural areas, harmonizing national legislation and managing the Common Agricultural Policy. This component is only intended for candidate countries.

Having in mind the research subject in the paper, it is necessary to pint out the basic peculiarities of the second component of the IPA programme - cross-border cooperation.

Namely, cross-border cooperation as the second component of the IPA programme, applied in the period 2007-2013, consisted of two parts. The first part, or the whole, concerned the assets allocated for bilateral cross-border programmes with the neighbouring Member States, while the other whole referred to the assets for the programmes with Serbia, Bosnia and Herzegovina and Montenegro. As current publications used to state, "the usual areas that were financed in cross-border cooperation were tourism, environmental protection, entrepreneurship promotion, etc. IPA cross-border cooperation in the mentioned period included two transnational programs as well, which could involve certain regions. It is the IPA Adriatic Programme and the South East Europe Programme" (Algebra University College, 2017).

In addition to the aforementioned, in theory, other specificities of cross-border cooperation were highlighted, such as the project promoters being non-profit legal entities that belonged to the following categories: organisations, institutions, chambers of commerce, regional and local authorities, regional development agencies, research and development centres, agricultural organisations, etc. Moreover, the cross-border character of the project had to be clearly visible, as well as a positive impact on both sides of the border (Algebra University College, 2017).

In the field of cross-border cooperation, in the period 2007-2013 Serbia had the opportunity to participate in six cross-border cooperation programmes with the neighbouring countries as well as two aforementioned transnational programmes. Thanks to its geographical position, AP Vojvodina was able to participate in four cross-border cooperation programmes (with Hungary, Romania, Croatia and Bosnia and Herzegovina).

Relevant aspects of development and realisation of cross-border cooperation of AP Vojvodina in the period 2007-2013 will be presented in the text below.

Methodology and data sources used

The subject of the analysis in the paper is the relevant aspects of development and realisation of cross-border cooperation of AP Vojvodina in the period 2007-2013. The method of theoretical content analysis with the basic methods of concretisation and specialisation, as well as the analytical-deductive method of data analysis, has been primarily applied in the paper.

In addition to the analysis of the cross-border cooperation of AP Vojvodina in the IPA programme implementation period, in the part of the paper that will sublimate the results of the subject analysis, an overview will be also made of the possibility of using pre-accession assistance for the period 2014-2020 within the IPA II programme.

Research results and discussion

Starting from the fact that Serbia did not have an accredited decentralised EU fund management system in the past period, and that it could not independently manage the EU funds, which implied the possibility of using only the first two IPA components (transition support and institution building and cross-border cooperation), during the period 2007-2013, the Republic of Serbia was given approximately EUR 1.4 billion of grants, of the total EUR 11.468 billion that the IPA programme implied and defined for the support of the countries in the process of EU accession (Group of authors, 2016).

The participation of AP Vojvodina in the funds defined by the IPA programme can best be seen in the field of cross-border cooperation (other IPA components).

Thanks to its geographical position, AP Vojvodina was able to participate in four cross-border cooperation programmes (with Hungary, Romania, Croatia and Bosnia and Herzegovina), financed from another IPA component.

As stated in the document called AP Vojvodina Development Program 2014-2020, that during the three calls for proposals within the Cross-border Cooperation Programme with Hungary, entities from the territory of AP Vojvodina attracted about EUR 21,695,257. In two calls with Romania, entities from Vojvodina attracted about EUR 10,294,398. Then, in the first call with the Croatian entities from the territory of Vojvodina, EUR 1,301,754 was approved (it should be noted that two public invitations were announced in the Cross-border Cooperation Program between Croatia and Serbia, but the authors at the time of writing the paper had only data for the first call, and accordingly, the values of donations to project partners from Vojvodina were shown less than real values), while in two calls with Bosnia and Herzegovina, entities from AP Vojvodina were approved EUR 167,372 (Group of authors, 2016).

The first table below shows the funds identified by the IPA programme for the implementation of the first two IPA components in Serbia in the period 2007-2013, showing the values of the percentage share of total assets allocated for Serbia in the overall assets foreseen by the IPA programme.

The second table then shows the reference values of AP Vojvodina's participation in four cross-border cooperation projects with the applicative analysis of the comparative values of each cross-border project, with a special overview of the percentage share of the realised assets in AP Vojvodina for each cross-border project in relation to the total IPA assets allocated for the Republic of Serbia, for the period 2007-2013, and defined for the second component.

Table 1. IPA programme identified assets for implementation of the first component - transition support and institution building, and other component - cross-border cooperation, in Serbia in the period 2007-2013.

Reference period	I IPA component	II IPA component	TOTAL per year	% share in total IPA assets per year	Total assets at the level of Serbia	% share of assets at the level of Serbia in total IPA assets
2007	181,496,352	8,203,648	189,700,000	1.65 %	1,395,868,923	12.17 %
2008	179,441,314	11,458,686	190,900,000	1.66 %		
2009	182,551,643	12,248,357	194,800,000	1.70 %		
2010	186,206,679	11,751,753	197,958,432	1.73 %		
2011	189,956,810	11,922,790	201,879,600	1.76 %		
2012	193,801,948	12,097,244	205,899,192	1.80 %		
2013	203,101,005	11,630,694	214,731,699	1.87 %		

Source: Group of authors, 2016, p. 196.
Note: Percentage values: author's calculation.

Having in mind the presented data, it can be noted that the amount of assets identified from the IPA programme for the implementation of the first two IPA components - transition support and institution building and cross-border cooperation in the Republic of Serbia, in the period 2007-2013, increased proportionally, which is confirmed by the perception of the percentage share of total assets per year at the level of Serbia in the total assets of the IPA programme.

Considering the percentage share of the total assets defined in the IPA Programme for the Republic of Serbia for the entire period (total assets: EUR 1,395,868,923), compared to the total assets available to the IPA programme (total IPA assets: EUR 11,468,000,000), it can be noted that 12.17% of the total assets of the IPA programme were defined for the whole period for the Republic of Serbia, which is a significant amount of assets allocated to support the economic and social transformation of a country that is in the process of accession to the European Union. In doing so, we should not lose sight of the fact that Serbia had the opportunity to use only the first two IPA components (out of a total of five that the IPA programme has foreseen).

In the context of the data presented in the following table, it should be noted that the percentage share of the IPA assets allocated for the implementation of the second component (cross-border cooperation) in Serbia in the period 2007-2013, in relation to the total IPA assets allocated for Serbia in the mentioned period, is 0.7%, which is significantly less compared to the percentage share of the IPA assets allocated for the implementation of the first component in Serbia in the same period (11.48%).

Table 2. The reference values of AP Vojvodina's participation in four cross-border cooperation projects - Hungary-Serbia, Romania-Serbia, Croatia-Serbia and Bosnia-Herzegovina-Serbia, in the period 2007-2013

II IPA component – Cross-border cooperation 2007-2013				
	Hungary - Serbia	**Romania - Serbia**	**Croatia - Serbia**	**Bosnia and Herzegovina - Serbia**
Total realised assets in AP Vojvodina	21,695,257 EUR	10,294,398 EUR	1,301,754 EUR	167,372 EUR
% share of APV assets in total IPA assets for Serbia, for II component (79,313,172 EUR)	27.35 %	12.98 %	1.64 %	0.21 %
Total projects in AP Vojvodina	198	59	11	2
Territory covered by the programme (districts) in AP Vojvodina	West Bačka district, North Bačka district, North Banat district, South Banat district, Central Banat district (South Banat district and Srem district are the joined regions)	North Banat district, Central Banat district, South Banat district	North Bačka district, South Bačka district, West Bačka district	South Bačka district, Srem district
Counties / Regions in the partner state:	Čongrad and Bač-Kiškun	Timis, Caras-Severin and Mehedinti	Osijek-Baranja, Vukovar-Srijem, Požega-Slavonia and Brod-Posavina counties	Sarajevo economic region and Southeast economic region
District in AP Vojvodina with the most attracted assets and applicants	South Bačka district (11,713,381 EUR; 107 applicants)	South Banat district (3,680,873 EUR; 19 applicants)	South Bačka district (801,063 EUR; 6 applicants)	Srem district (104,686 EUR; 1 applicant)
District in AP Vojvodina with the fewest attracted assets and applicants	South Banat district (35,700 EUR; 1 applicant)	North Banat district (204,754 EUR; 3 applicants)	West Bačka district (190,110 EUR; 1 applicant)	South Bačka district (62,687 EUR; 1 applicant)

II IPA component – Cross-border cooperation 2007-2013				
	Hungary - Serbia	**Romania - Serbia**	**Croatia - Serbia**	**Bosnia and Herzegovina - Serbia**
Cross-border project priorities	1.) Infrastructure and environment; 2.) Economy, education and culture; 3.) Technical assistance	1.) Economic and social development; 2.) Environmental protection and emergency preparedness; 3.) Promoting the "people to people" exchange; 4.) Technical assistance	1.) Sustainable socio-economic development; 2.) Technical assistance	1.) Social and economic cohesion through activities for the improvement of physical, business, social and institutional infrastructure and capacities; 2.) Technical assistance

Source: Group of authors, 2016, p. 197-202; Pejović et al., 2011, p. 59-72.

Note: Percentage values: author's calculation.

Having in mind the available data, it is concluded that in the period 2007-2013, the highest amount of assets and the most projects were realised in the cross-border cooperation between Hungary and Serbia (EUR 21,695,257 and 198 projects).

The districts from the territory of AP Vojvodina with the most attracted assets and applicants are: South Bačka district from cross-border cooperation Hungary - Serbia (EUR 11,713,381 and 107 applicants) and South Banat district from cross-border cooperation Romania-Serbia (EUR 3,680,873 and 19 applicants).

The districts from the territory of AP Vojvodina with the fewest attracted assets and applicants are the following: South Banat district from cross-border cooperation Hungary - Serbia (EUR 35,700 and 1 applicant) and South Bačka district from cross-border cooperation Bosnia and Herzegovina - Serbia (EUR 62,687 and 1 applicant).

The percentage share of assets realised in AP Vojvodina for each cross-border project in relation to the total assets allocated for the Republic of Serbia for the period 2007-2013, and defined for the second component, is shown in the following way: cross-border cooperation Hungary - Serbia: 27.35%; cross-border cooperation Romania - Serbia: 12.98%; cross-border cooperation Croatia - Serbia: 1.64%; cross-border cooperation Bosnia and Herzegovina - Serbia: 0.21%.

Conclusion

The current definition of the regional policy of the European Union, stated in the Europe 2020 Strategy, highlights the importance of this programme for the candidate countries as well as the neighbouring countries, stating that the enlargement of the space where European Union rules apply will create new opportunities both for the European Union and for its neighbours, encouraging a balanced and sustainable development as a presumption of stability.

For the period 2014-2020, the European Commission has created a new Instrument for Pre-Accession Assistance (IPA II), with the aim of closer connection with the EU enlargement priorities, aimed at achieving results and a strategic approach to key reforms in the candidate countries and potential candidates for EU membership (Pejović et al., 2014).

The IPA II programme contains a variety of differences compared to the previous IPA programme for the period 2007-2013. One of the major changes relates to the structure of the IPA II programme, in which, instead of the existing five components that were characteristic for IPA, the so-called policy areas have been introduced. Policy areas within IPA II are: reforms as part of preparations for EU membership and institution and capacity building; socio-economic and regional development; employment, social policy, education, promotion of gender equality and human resources development; agriculture and rural development; regional and territorial cooperation. These policy areas are very similar in content to the IPA components and are now available to all beneficiary countries regardless of their status in the European integration process (candidates or potential candidates for EU membership) (Pejović et al., 2014).

Total IPA II budget for the period 2014-2020 amounts to EUR 11.7 billion. Indicative allocation of IPA II to assistance beneficiaries 2014-2020 for the Republic of Serbia, amounts to EUR 1,508,000,000 (Pejović et al., 2014), which accounts for 12.89% of the total IPA II assets, and confirms the commitment of the IPA II programme to continue its assistance to cross-border cooperation programmes between candidate countries and potential candidates, as well as between them and the EU Member States that they border with.

As for the area of pre-accession assistance, after years of experience in the use of the available components of the IPA programme, the AP Vojvodina Regional Development Framework sets out the following main challenges for acquiring the possibility of using pre-accession assistance for the period 2014-2020 (IPA II): insufficient level of high-quality strategic framework, unwillingness of urban and project-technical documentation for infrastructure projects, unresolved property relations, pre-financing and co-financing of projects, and sustainability of administrative capacities (Group of authors, 2016). The same document points out "recommendations such as active participation in programming and monitoring of international development assistance, strengthening of human capacities, development of urban, planning and project-technical documentation, and establishing of mechanism for co-financing and pre-financing projects," (Group of authors, 2016) as key conditions for further use of international development assistance funds.

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Conflict of interests

The authors declare no conflict of interest.

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STATE OF AGRO-FOOD FOREIGN TRADE IN BOSNIA AND HERZEGOVINA

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ABSTRACT

Trade of agricultural products plays an important role in food security, development of production and processing of products, strengthening the economy and GDP growth. The aim of this paper is to establish the trend of trade of food, live animals, drinks and tobacco in Bosnia and Herzegovina (B&H). Foreign trade of food products in B&H has been investigated for the past six years (2012-2017). In B&H, annual import of agricultural and food products exceeds BAM 2.5 million and the export is approximately BAM 600 million. Food production is a strategic interest of every country. The coverage of import by export was the highest in 2017 (29.9%) and 2016 (29.4%), while the lowest was in 2014 (18.4%). During the investigated period, there was a deficit of trade in B&H. Both export and import in agro-food sector have been increasing recently, while the volume of export has a higher growth than import.

Introduction

Manufacture in food and beverages sector opens new opportunities related to the increase of employment, productivity, marketing and sales in order to satisfy a consumer. Agro-food sector is important for economic development of B&H. At the beginning of the 21st century, food industry and other economic sectors started their recovery from damages caused by the war at the end of the 20th century. In the post-war period, economy was passing through a transition period included in the still ongoing privatization program (Cvijanović et al., 2013; Radosavac and Pejanovic, 2012).

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Specificity of the economy in Bosnia and Herzegovina reflects in development and functioning of two separate economies, namely: economy in the Republic of Srpska (RS) and economy in the Federation of Bosnia and Herzegovina (FB&iH). Both these economies are separately organized. Within the economy of the Federation of Bosnia and Herzegovina, there are numerous economies in the Cantons, which further complicates the situation (Radosavac, 2014). In addition, trade policies are generally very complex and have a high influence on agro-food trade (FAO, 2014).

Agro-industry and trade of Bosnia and Herzegovina are exposed to a strong competition pressure on the global food trade system. International trade is the result of relationships between national trade policy strategies and international and regional contracts (Rusali, 2013). In addition, the internal deficiency of B&H agro-food sector lays in the level of the use of natural resources in agricultural production and generally low efficient organization (unused arable land, water), as well as in low investments and a low level of technology production.

Globalization of food industry has enabled achieving capital and technology, what is very important for the increasing of production (Kefela, 2011). Development of all economy branches can help implementation of the program of agricultural production and food processing industry, providing it to be more competitive, and food trade practices (McCornick et al, 2008: Liapis, 2011).

In Bosnia and Herzegovina, there is a potential for developing agricultural production due to the existence of arable land, climate conditions, geographical position and favorable labor cost. The estimates of the resource costs indicate the efficient use of resources in crop production and a potential for increasing productivity. Agriculture is an important sector for the employment of approximately 20% of the total number of employed persons in B&H. Food industry in B&H has made a progress in the production of agricultural products, especially of milk and certain species of fruit and vegetables.

However, agro-food sector declines in the share of GDP, as well as in trade. Gross domestic product (GDP) of Bosnia and Herzegovina in 2016 was BAM 29899.0 million and GDP per capita amounted to BAM 8516.0 or EUR 4354.0 (ASB&H, 2017).

The volume of production in agro-food sector is limited by numerous factors, such as a low level of the use of the existing capacity of manufacture, high costs of raw material and low income from final products. High cost of raw materials is mainly the result of relying on several dominant retailers of raw material, in combination with a high degree of the regulation of import markets. Important roles in advancing the agro-food productivity have investments in research and development programs (Cameron et al., 2005). This leads to a reduction of productivity and competitiveness, since a limited degree of availability of modern materials makes it difficult for farmers to export their products and to participate in modern supply chains.

Increase of GDP is possible on the basis of the efficient increasing of production volume, use of local resources, surplus of export, reduced import and a decline of trade

deficit, (Radosavac and Pejanovic, 2012). In addition, investment in food, beverages and tobacco is very important for improving economy, as well as for the creation of new enterprises and integration with the developed economic networks.

Improvement of the export of food products is an important factor for the development of agro-food sector and for achieving better foreign trade results in B&H.

The aim of this paper is to analyze foreign trade of food products in B&H between 2012 to 2017, and to estimate the possibilities of improving export and foreign trade.

Materials and methods

A trend of foreign trade in agro-food sector of Bosnia and Herzegovina between 2012 and 2017 was investigated in this paper. For this study, we have used the data provided by the Agency and Department of Statistics of Bosnia and Herzegovina, Foreign Trade Chamber of Commerce of Bosnia and Herzegovina Sarajevo and the RS Statistical Office Banja Luka (ASB&H, 2015; 2017; MOFTER B&H, 2013; 2015). The obtained data were used for the analysis of import and export according to the Standard International Trade Classification (SITC), in a six-year period, 2012-2017. All obtained data were analyzed by using scientific descriptive methods, methods of analysis and synthesis and comparative analysis method.

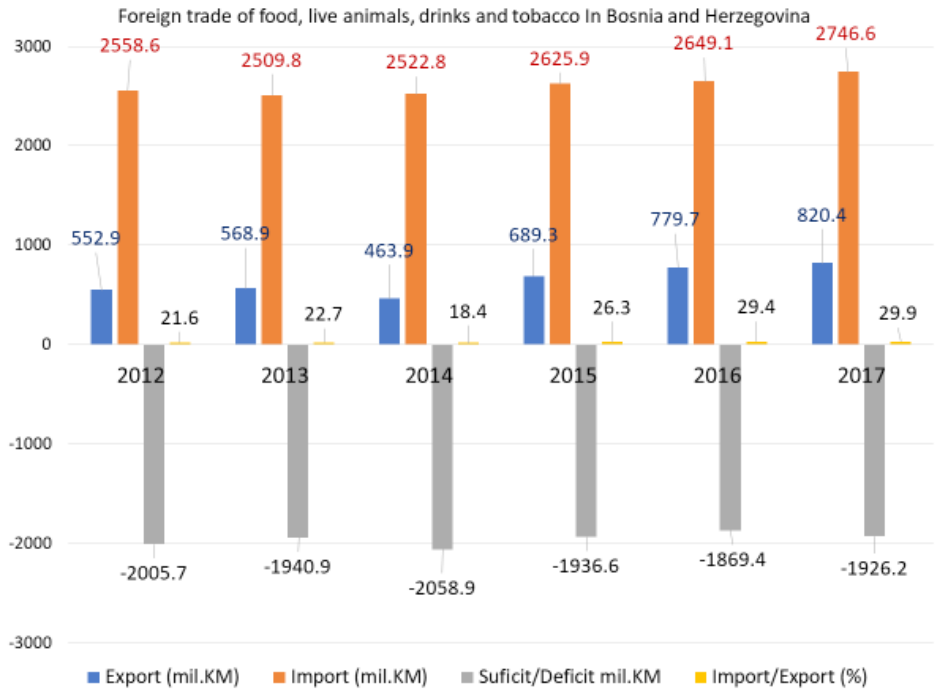
Results

Economy in B&H was reflected in total agro-food trade, which varied from year to year. Between 2012 and 2017, the volume of foreign trade of food, drinks and tobacco was the highest in 2017 (BAM 3567 million) and the lowest in 2014 (BAM 2986.7 million) (Figure 1).

Within total foreign trade in this period, the value of food, drinks and tobacco export varied from BAM 820.4 million in 2017 to BAM 463.9 million in 2014. The import of food, drinks and tobacco was three to five times higher than the export, depending on a year.

The highest import was in 2017, BAM 2746.6 million, and the lowest was BAM 2509 million (Fig. 1). Bosnia and Herzegovina had a deficit in foreign trade of food, beverages and tobacco during all six years covered by this study. The largest deficit (BAM -2.058 million) was in 2014 and the lowest (BAM -1869.4 mil.) was in 2016 (Figure 1).

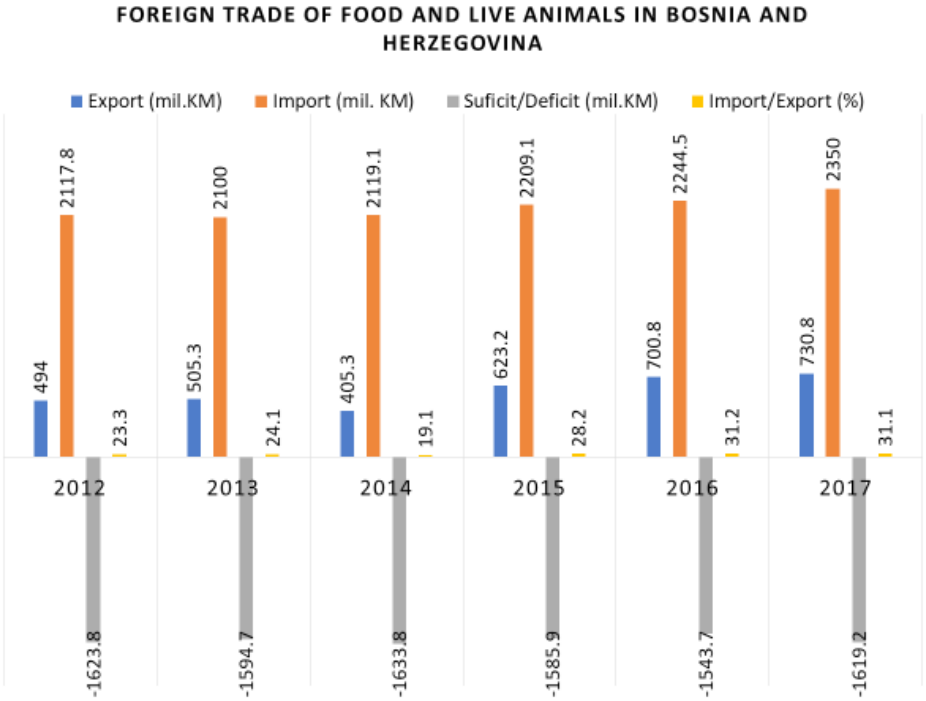
Figure 1. Trend of foreign trade of agro-food products in Bosnia and Herzegovina



Source: Federal Ministry of Agriculture, Water Management and Forestry

In total foreign trade, the trade of food and live animals was the highest in 2017, BAM 3080.8 million, while the lowest was in 2014, BAM 2524.4 million. According to the data, it can be concluded that the import of food and live animals was the highest in 2017, BAM 2350.0 million, and the lowest was in 2013, BAM 2100.0 million, while the highest export of food and live animal was the highest in 2017, BAM 730.8 million and the lowest was in 2014, BAM 405.3 million (Figure 2).

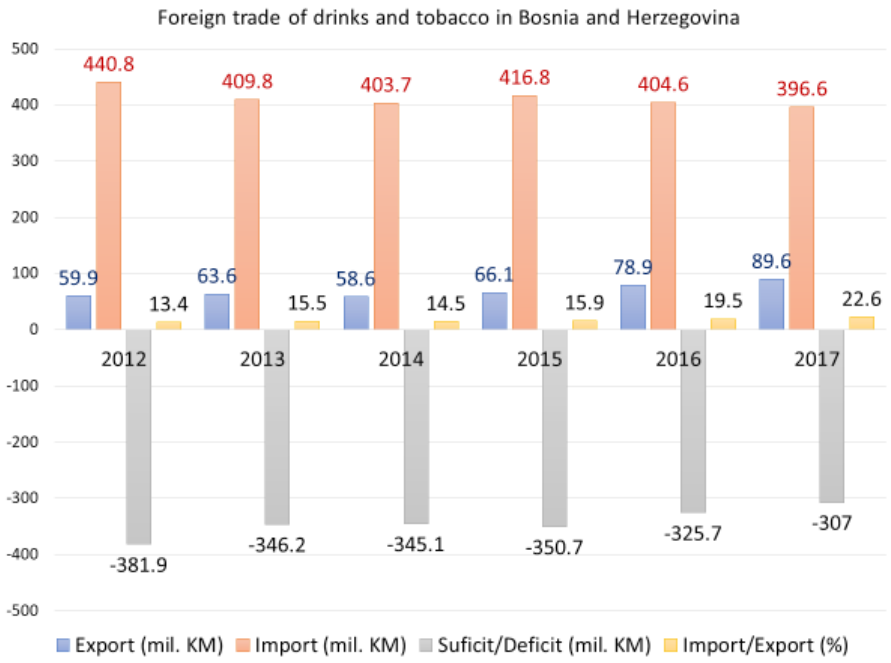
Figure 2. Trend of foreign trade of food and live animals in Bosnia and Herzegovina



Source: Federal Ministry of Agriculture, Water Management and Forestry

Total trade of drinks and tobacco during the studied period (2012-2017) was the highest in 2012, BAM 499.7 million, and the lowest in 2014, BAM 462.3 million. In total foreign trade of drinks and tobacco, the highest import was in 2012, BAM 440.8 million and the lowest was in 2017, BAM 396.6 million. However, the highest export was in 2017, BAM 89.6 million, and the lowest was in 2014, BAM 58.6 million (Figure 3).

Figure 3. Trend of foreign trade of drinks and tobacco in Bosnia and Herzegovina



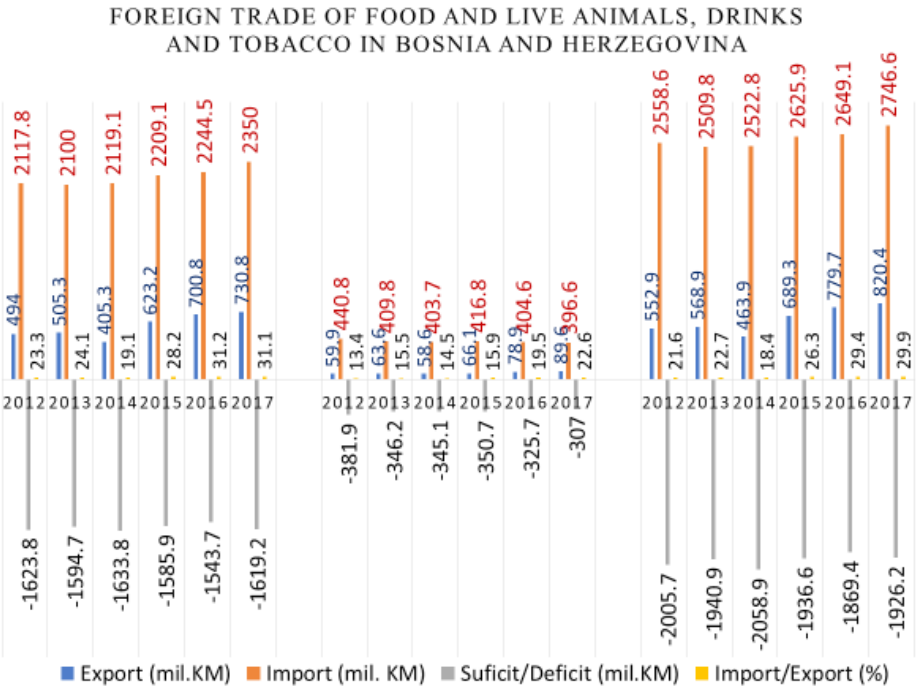
Source: Federal Ministry of Agriculture, Water Management and Forestry

The share of food and live animals in total import was the highest in 2017, BAM 2350.0 million with a deficit of BAM -1619.2 million, and the lowest was BAM 2100.0 million, with a deficit of BAM -1594.7 million. However, in the trade of food and live animals, the highest deficit was in 2014, BAM -1633.8 million, and the lowest export in comparison to the value of export in other analyzed years was recorded in the same year. The export of food and live animals (BAM 405.3 million) in 2014 covered 19.2% of the value of import (BAM 2119.1 million) while the export in 2016 (BAM 700.8 million) and 2017 (BAM 730.8 million) covered 31% of import (Figure 4).

During the analyzed period, the import of food and live animals was 0.8% lower in 2013 than in 2012. In comparison to the import in 2012, the import of food and live animals was increased by 0.1% in 2014, by 4.3% in 2015, by 6% in 2016 and the highest increase was registered in 2017, 11.0% (Figure 4).

The export of food and live animals compared to the value in 2012 was increased by 2.3% in 2013, decreased by 1.8% in 2014, while in the period that followed, it was increasing as follows: by 26.2% in 2015, 41.9% in 2016 and 47.9% in 2017 (Figure 4).

Figure 4. Variation of foreign trade of food and live animals, drinks and tobacco in B&H 2012-2017



Source: Federal Ministry of Agriculture, Water Management and Forestry

In the trade of drinks and tobacco, the highest import was BAM 440.8 million with a deficit of BAM -381.9 million in 2012, while the lowest import was BAM 396.0 million with a deficit of BAM -307.0 million. The export of drinks and tobacco (BAM 58.9 million) in 2012 covered 13.4% of the value of import (BAM 440.8 million), while the export of drinks and tobacco in 2017 (BAM 89.6 million) covered 22.6% of import. During the analyzed period, the import of drinks and tobacco was decreased by 7.0% in 2013 as compared to 2012. The import of drinks and tobacco was also decreased by 8.4% in 2014, 5.4% in 2015, 8.2% in 2016 and 9.0% in 2017 (Figure 4).

The export of drinks and tobacco 2012 was increased by 8.0% in 2013, 0.5% in 2014, while in the period that followed it was increased by 12.2% in 2015, 34.0% in 2016 and 52.1% in 2017 (Figure 4).

Discussions

In the past three decades, agro-food sector in B&H has been influenced by the changes in economy transition, institutional restructuring and political development.

Climate and orographic conditions are favorable for developing agricultural production in Bosnia and Herzegovina. Total arable land in B&H amounts to 1.024,000 hectares, out

of which 40% has not been used in recent years. The reasons for unused arable land are unresolved property and legal relations, and the areas being mined during the war. In addition, state agricultural companies have stopped their production on the land whose share is 15% of the total arable area, due to a low volume of production and export (ASB&H, 2017). Small volume of the export of agricultural products in B&H has reflected the problems related to the fact that large areas of agricultural land have not been cultivated for many years and a small abundance of domestic animals, which cannot satisfy even the minimum needs of the processing capacity and consumption (Radosavac et al., 2015).

In Bosnia and Herzegovina, there are natural resources for agricultural development (Berjan et al., 2015). Favorable climate conditions and production capacity of food industry are followed by numerous problems in this sector. The main difficulties related to agricultural development are small number of farmers, small number of young farmers, elderly households, reduction of arable land, lack of agricultural machinery, high prices of raw materials and protective equipment, and difficult transportation of the products on the market due to poor roads. These factors influence the increase of production costs, reducing productivity and competitiveness on the market.

Development of agricultural and food industry production was influenced by economic crisis (Rusali, 2014). Economic crisis (in 2009) has induced higher disturbances in agro-food sector in B&H than in developed countries, regardless of competition with foreign producers under the trade liberalization, and has affected the possibility to improve participation with domestic agro-food products on the international markets. The most important export market for agricultural products from B&H was the market of CEFTA 2006 member countries (Ćejvanović et al., 2014).

To increase competitiveness, it is necessary to increase investments in new equipment, to improve the program of innovative production based on research and development, to continuously improve the employees' qualification skills, and to stimulate the added values of products and services (Putićová and Mezera, 2011). This approach will contribute to developing of the policy of balanced foreign trade and high coverage level of import by export (Dinu et al., 2015).

The complexity of B&H economy is the result of separate entities of the RS and Federation of B&H, as well as by separate management of natural resources that are the basis for agriculture and food industry development. In the previous period (2005-2011), Bosnia and Herzegovina also had a negative foreign trade balance or a deficit in agricultural trade. Total deficit in trade of agricultural products in 2011 was increased by 10.69%, while the deficit with CEFTA 2006 members was decreased by 2.38% (Ćejvanović et al., 2014).

Generally, variation of trade in recent years is related to a structure of the products in all industries. In food industry, among the top 20 imported products are wheat, bread, biscuits, cakes, chocolate, various food products and beer. The most of food products imported into B&H can be produced in the country, but their production has not been started. Trade analysis has revealed a greater increase of import compared to export (Radosavac et al., 2015).

Due to insufficient domestic capacity utilization in B&H, there is a high import of all types of food products, especially the products of lower quality than the domestic ones. The largest import of food products originates from the neighboring countries such as Croatia and Serbia, with which B&H and RS have concluded free trade agreements, with 0% tariff rate for the import (Radosavac et al., 2015).

The state of agro-food sector is a consequence of excessive import and unfair competition on domestic market, low-cost finished products, a lack of the state incentives for production and export, funding issues etc, which leads to the reduction of productivity and competitiveness. Under these conditions, farmers make changes in the structure of their growing crops with the aim to make income. This was confirmed by the data that, in 2017, the area under wheat was decreased by 2,7%, under barley by 1,1%, carrot by 12,0%, cabbage by 3,7%, in relation to the same period in 2016. On the other hand, the areas under raspberries were increased by 22.1%, buckwheat by (11.2%), triticale by (5.8%), soybeans by (7.5%), rape seed by 24,1% and tobacco by 2.4%. (B&H Agency for Statistics, 2017).

The value and trend of foreign trade of food, drinks and tobacco in B&H have a negative influence on domestic production and agricultural producers. In future, it is necessary to estimate and improve the relationship between production and consumption, protection of domestic market by increasing the levels of investment, as well as to optimize conditions for the employment of workers, the use of resources and easier placement of the products on foreign markets.

According to the potential of natural, social and economic resources in B&H, there is a possibility for developing the economy by increasing production, through the introduction of modern technologies and efficient use of domestic companies' capacity. Those enhancements would contribute to the decrease of food products import. The key food industry issues are defined and the possibility of improving and enhancing foreign trade is suggested.

The main factors for development of agricultural production are increasing the number of farmers, introduction of new technology production and continuous education for the protection of biodiversity and agro-ecosystem. Important role is the farmers' response to a land degradation and its potential impacts on agricultural productivity and food security (Wiebe, 2003).

Export of food products represents an important economic activity for the development of agriculture and food industry of B&H. In order to achieve better results in foreign trade with other countries in the region, it is necessary to explore the market and its products adapted to the requirements and needs of foreign consumers. In addition, for the progress in agro-food sector, it is necessary to improve economic environment through developing the market infrastructure, correcting price incentives, and encouraging rural income growth and diversification (Radosavac, 2014).

In order to improve the import-export balance, Bosnia and Herzegovina needs to increase investments in economy, provide funding for cooperation in agro-food sector through joining the program of production and market with the neighboring countries.

Conclusions

Different values of export and import of food, live animals, drinks and tobacco in B&H for the period between 2012 and 2017 were established in this paper. Each year is characterized by a deficit in the trade of agricultural products, since the value of import is higher than export by BAM million.

The coverage of import of food and live animals, drinks and tobacco by export was different depending on a year and varied between 18.4% in 2014 and 29.9% in 2017.

Between 2012 and 2017, a deficit in trade of food and live animals, drinks and tobacco was the lowest in 2016 and 2017, which indicates the progress in relation to agricultural production and marketing.

Higher export level and the decrease of deficit can be achieved by increasing the quality and quantity of agricultural products and through improving competitiveness on the market. In addition, progress in agricultural sector can be supported by investments in modernization of technology of production and processing.

The value and trend of foreign trade of food, drinks and tobacco in B&H have contributed to the value of GDP.

For the accomplishment of a surplus in trade of agricultural products, the following is important: government support, an efficient form of organizing in production, marketing and trade as well as cooperation with the neighboring countries and access to the European and world markets.

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Conflict of interests

The authors declare no conflict of interest.

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THE ROLE OF DIGITAL MARKETING IN PROMOTION OF WINE FROMAP KOSOVO AND METOHIJA

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ABSTRACT

The territories of AP Kosovo and Metohija represent the challenging and fast-growing wine market. However, many wine producers from Kosovo and Metohija are forced to acquire an innovative marketing approach which provides enhanced consumer experience and value. Therefore, they have implemented various marketing strategies in order to develop a positive brand reputation and create new opportunities for small and medium-sized wine producers. This paper aims to inspect the role of digital marketing in promotion of wine from Kosovo and Metohija, which enables producers to combine and integrate different marketing techniques in order to promote their strengths, that is, brand. Based on the primary data collected through the questionnaires, in-depth interviews and surveys, this study attempts to show how using digital marketing is statistically significant with reported increases in wine sale. The findings show that digital marketing facilitates the implementation of various marketing strategies which can improve the value of the consumption experience offered to the customer.

Introduction

Research studies have shown that in the last two decades wine production has become increasingly competitive and globalised, while the wine marketing is considered to be information-intensive (Stricker et al., 2007). During the years, trade barriers have diminished, communication have become almost instantaneous, and consumer behaviour has evolved from traditional to experimental. Producers concerned with marketing have had to adjust production, distribution, and marketing strategies to cope with these changes. Due to the rapid development of e-commerce technologies (Quinton and Harridge-March, 2003) which is coupled with the global consumption

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of wines (Bernetti et al., 2006), there are many opportunities for the wineries which decide to use direct marketing channels, such as the Internet (Bruwer and Wood, 2005). Its tools and applications have allowed small and medium-sized wineries to become highly competative at global market.

The art of wine-making in the area of AP Kosovo and Metohija is more than 2,000 years long. There are a numerous archaeological findings, historic data and various toponym s that indicate that the wine production dates back to the Serbian royal house of Nemanjić who promoted wine growing and outlawed the practice of adding water to wine. Later, Emperor Dušan the Great made a 25 km long "wine pipeline" which transported wine from his vineyards to his court in Prizren. According to the vinopedia.rs, in 1988 there was 9,000 hectres of vineyards in the territory of Kosovo and Metohija, while today the area covered by vineyard totals 3,220 hectares. There are two main wine growing regions within AP Kosovo and Metohija which should be mentioned. The first is known as North Methohija region which spreads on the terrains in the northwest part of Metohija from the slopes of Mokra Gora in the north to the river Pećka Bistrica in the south, and it has two wine growing districts: Istočko and Peć. South Metohija region is the second main region which spreads in the southwest part of Kosovo and Metohija, that is, in the area of South Metohija. It has five wine growing districts: Đakovica, Orahovac, Prizren, Suva Reka and Mališevac (Ivanišević, Jakšić, 2014). When it comes to exporting Kosovo and Metohija's wine, number one destination for wine sale is Serbia (13,289,071 litres), followed by exports to Germany (6,194,042 litres), Croatia (9, 090,383 litres), Macedonia (2, 809, 194 litres) and Slovenia (2,881,026 litres).

In the world where companies attempt to adapt to consumer empowerment in order to achieve a greater profitability, understanding consumer's needs is possible through an adequate marketing approach which will provide increased sales of domestic wine and the quicker development of the national market (Radovanović, Đorđević & Petrović, 2017). Digital marketing has been proven tool which helps producers to achieve their goals. However, in AP Kosovo and Metohijadigital marketing does not have a significant presence, despite the fact that there are many internet users.

In Kosovo and Metohija, producers appear to be on the fence when it comes to using the benefits of digital marketing; they have still not figured out whether the opportunities outweigh the challenges. While acknowledging that the topic needs more extensive research, this paper analysis the main advantages and challenges associated with the implementation of an online marketing strategy and ways of brand activation of wine in the territories of AP Kosovo and Metohija. The basic hypothesis in this paper is that the digital marketing influences the decision on the purchase of wine. Therefore it is necessary to analyse the influence of factors on making a decision to purchase and consume wine, in order to understand the behaviour of consumers. After a brief discussion on the characteristics of the wine marketing in general and the presentation of wine production in Kosovo and Metohija, the paper explores factors that influence the purchase of wine, as well as opportunities for implementation of digital marketing in Kosovo and Metohija. The research methodology applied to collect and analyse data

is then presented, and the findings are discussed in direct relation to the formulated research objectives. This research concludes with a summary of the main result and with propositions for future investigation on this subject.

Material and methods

In this research work, on the basis of combined methods of studious analysis and comparisons of theoretical postulates with research in the area of Kosovo and Metohija, it was attempted to find adequate solutions to the problem of placing wines from these areas.

Mainly due to globalization, there is an increase in competition on the wine market. There are 3 driving forces that lead to stronger competition and represent the greatest influencers of the increasing competition in the wine market (Abegão, 2016):

1. worldwide over-supply of grapes and incumbent pricing pressures, due to favourable weather conditions and consequent increase in plantings, and "low price/high quality" product strategies being applied by many wine companies;

2. increased consolidation at producer, distributor and retailing sectors, since as winery grow their business, their tendency is to merge with other companies to obtain a stronger position in the market;

3. shifting consumer behaviour patterns, which may affect the business of wineries if they do not adjust their strategy.

Kotler and Keller (2006) examined the wine market in order to identify the attributes of wine that have the most significant influence on the decision of consumers when purchasing certain wine. A strategic advantage is the existence of a product that has a protected designation of origin as a quality factor of this product (Bruwer& House, 2003).

Wine production in Metohija andchallenges in operating a winery

At its peak in 1989, Kosovo boasted 9,000 hectares of vineyards, divided into private and public ownership, and a major export business (40 million liters that year to Germany alone) (Nurre Jennions, 2017).

Wine industry in Kosovo and Metohija collapsed in 1990s, when the former Yugoslavia fell apart, and much of its infrastructure was destroyed by war. After the fighting subsided, a number of state-owned wineries were privatised, and production began to recover. There are signs that a once-thriving industry is getting back on its feet (Tabak, Hugh-Jones, 2011), especially after a symposium held in Orahovac/Rahovec in 1997 that initiated an annual festival to celebrate the grape harvest and the region's wine producers.

Today, Kosovo has some 3,000 hectares of vineyards and 15 wineries that range in size from formerly state-owned behemoths to small family wineries. Two big enterprise

operational in Orahovac/Rahovec (Stone Castle) and Suva Reka(Agrokosova Holding) have been privatized, and currently cover an area of 850 hectares of vineyards, comprising 27% of the total area of active vineyards in Kosovo.

The area of Orahovac/Rahovec vineyards has ideal conditions for producing high-quality wines, using different varieties of grapes. It is a part of southern sub-region of Kosovo and the most prominent area of Kosovo vineyards and winery. All vineyards lie along the hilly terrain and the moderate continental climate make this area very specific imbuing it with special properties for production of high quality and premium grapes and wines. Grape varieties mainly (around 65%) belong to red grape. The most representative cultivars are: Cabernet Sauvignon, Merlot, Pinot Noir, Vranac, Prokupac and Tamjanika. "Stone Castle" winery is the largest region's winery, with a capacity to produce up to 30 million liters per year. It, also, contributed to the local economy by purchasing from area's farmers. Just outside of Orahovac is the scenic Serbian village of Velika Hoča, known for having 13 churches for its 120 residents, and as the place where the monks of Dečani Monastery have been producing wine since the 15th century.

Some of the most famous wineries on the ninth of the marked wine routes in Serbia are Vinica Petrović from Velika Hoča, as well as Antić winery from Orahovac. They make wine using Italian Riesling, the Rhein Riesling, Red Burgundy, Vranac, Sauvignon and Cabernet sorts (Serbia.com).

Figure 1:Panorama of the Orahovac vineyards.

Source: http://www.vinopedia.rs

Factors that influence consumer purchase decisions

Many factors influence consumer behaviour toward wine. Perhaps the greatest shift in consumer purchase behavior over the past decades has been from table wines to quality wines, particularly in traditional wine-drinking countries (Lapsley & Moulton, 2001).There are many factors such as the bottle shape, colour, the type of closure (cork, technical composite or screw top), the grape, the winemaker's skills and label

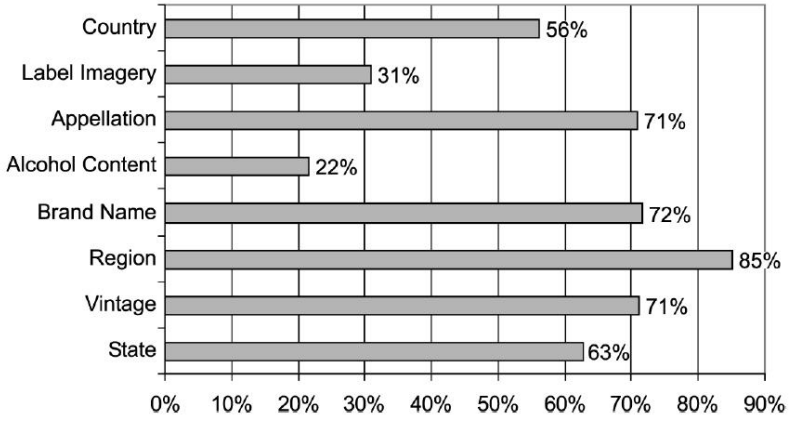
presentation (design, information provided, logo) that influence consumer choice in purchasing wine (Jennins and Wood, 1994; Barber, Almanza, Donovan 2006). However, each decision-making process starts with the recognition of need.

Marketing is an important technique for wine promotion, as well as branding. However, while marketing activates buyers convincing them to purchase a particular brand (wine) - branding makes loyal customers. Building customer loyalty is the ultimate goal for wine producers and the perceived quality of wine raises the quality expectation (Hussain, Cholette, &Castaldi, 2007).

According to House (2003), regionality helps to differentiate a product and create a clear association between product brand and region of origin. Within AP Kosovo and Metohija, Orahovac Valley has secured the top position and is most recognized as a quality wine region, therefore, its wine represents the regional brand. Bruwer and House (2003) claimed that region-of-origin ranked third behind price and grape variety in consumers' wine-buying decision.

Figure 2illustrates that 85 per cent of wine consumers indicated that they consider the region when assessing a wine label. This was the most important factor, more important than brand name, label image, appellation, vintage, alcohol content, country or state.

Figure 2. Information on wine labels used to gauge quality



Source: Regional brand image and perceived wine quality: the consumer perspective (2018)

The acknowledged wine critic Jerry D. Mead said that "60 percent of wine sales are based on that ever-elusive air around the bottle". In fact, Mead was referring to the importance wine packaging has over the consumer's purchasing decision (Sawyer, 2006). However, wine has a unique constraint that sets it apart from other products, because the quality of the wine itself cannot be assessed until it has been consumed (Lockshin, 2001; Fernandes Ferreira Madureira&Simoes de Sousa Nunes, 2013).

Wine consumer goes through five stages before the actual purchase. Consumer recognizes the need, gathers information, evaluates alternatives and makes the purchase decision. When the purchase is done, the consumer evaluates the received satisfaction level (Kotler & Armstrong, 2010).

In order to create an effective marketing, it is important to understand target audience's behaviour during the whole decision-making process (Kotler & Keller, 2012), which can be summarized through the following stages:

1. *Need recognition &problem awareness.* The need recognition is the first stage of the consumer decision process in which consumer recognizes what the problem or need is and what kind of product would be able to meet this need.

2. *Information search.* At the second stage, the consumer gathers information from multiple sources –by talking with friends, reading magazines or using the Internet, or by using internal search which refers to the information a consumer has stored in their memory about a particular product.

3. *Evaluation of alternatives.* The next stage is the evaluation of alternatives which involves the evaluation of alternative brands in the product category. The consumer evaluates alternatives and makes a choice based on the various criteria (i.e. time and money costs, how much information the consumer already has, the amount of the perceived risk if a wrong selection is made, etc.)

4. *Purchase.* At this stage, the consumer is ready to buy certain product.

5. *Post-purchase behaviour.* The consumer will compare products with their previous expectations and will distribute their positive or negative feedback about the product, which can be done through reviews on website, social media networks or word-of-mouth.

The emergence of the Internet helped wine companies to advertise their products, to target the right audience, and to measure responses instantly. Advertising became a marketing communication tool that refers to the differences and similarities between customer's perception and company's expectations. Due to the development of digital marketing, companies are able to set up official brand pages on Internet, particularly on social media sites, and post updates to consumers however often they choose. Internet and digital marketing can help companies grow their business and increase brand awareness. However, most companies have not yet adopted the new technology.

For buyers looking for places to go tasting wine, Internet is a perfect chance to make a great first impression with a captivating image of winery tasting room, vineyards, cellar, etc. Unfortunately, some wineries with some picturesque tasting rooms completely fail to convey this beauty on their websites. According to vinboundmarketing.com, the bulk of consumers will spend at least an hour online visiting websites after website to plan out their ideal tasting trip.

Therefore, digital marketing is said to have and impact on consumers' behaviour and personal attitudes towards the particular wine brand. It can be stimuli for buyers to pay attention to the product, compare it with what other companies in the same marketing niche are saying, and finally make a decision concerning the product (Rodgers & Thorson, 2000).

Web Advertising

Web advertising can be presented in several forms such as hyperlinks, interstitials, and pop-ups (Rodgers and Thorson, 2000) and it generally refers to the small, hyperlinked pixel banners popping up on Web sites (Rex B. and Hollis N., 1997). According to Ducoffe (1996), Web ads are more relevant to consumers compared with traditional ads, which also implies that online users tend to perceive the ads to be self-related or instrumental in achieving their needs and values (Maclnnis and Jaworshi, 1998). It is able to take advantage of addressable media technology to select appropriate ads that fit with users' online behaviours, and thus make the ads more relevant to consumers.

According to some previous research, the users consider sponsored links to be more informative, more entertaining and less striking than web banners. However, users find web banners more visible than sponsored links. In practice, producers from Kosovo and Metohija are not adequately familiar with the opportunities of digital marketing, despite the fact that there are reasons for success of it in Kosovo and Metohija. The main reasons why it can succeed are: low cost compared to traditional marketing (TV, radio, billboard, etc), a positive attitude of businesses towards digitalization, a large number of potential customers, and increased need for professionals in this field. Compared to traditional media, which is expensive and can reach limited audiences, digital marketing tools provide opportunities to advertise to anyone in the world with access to these digital tools. In Table 1 is presented a comparison of traditional marketing with digital marketing.

Table 1: Traditional Marketing vs. Digital Marketing

	Traditional Marketing	**Digital Marketing**
Reach	limited	global
Accessibility	limited	diverse
Communication	one-way	two-way
Availability	limited	very quick
Targeting	hard	easy
Measurement	hard	easy

Source: Author's own empirical work

According to the KPM (Independent Media Commision), 90% of businesses in Kosovo agree that digitalization not only cuts advertising costs, but it also improves the advertising quality. Chaffey (2015) points out that Internet usage keeps growing every day and it is used by more than 40% of the world's population.

The study conducted by KPM shows that 67% of businesses in Kosovo think that advertising plays a key role towards a company's success. A study by STIKK (2013) shows that in Kosovo, internet penetration is at about 77%, which is a high percentage.

Wine Banding

Branding is a very important factor that makes or breaks the winery's sales. It is about individuality of each consumer and how he perceives brand values (Brandon, 2017) According to American Marketing Association Dictionary (1960), a brand is "A name, term, design, symbol, or any other feature that identifies one seller's good or service as distinct from those of other sellers." In other words, brands are a means to differentiate from the competitors (or future competitors).

Christian Seely (2010) points out that a brand could aid value, where value is the highest price possible, at which a consumer will be enthusiastic to pay for a bottle of wine. Wine branding is also an efficient way for growth, giving a competitive advantage, but with a heavy local market dependency. "Brand performance is strongly influenced by geographical and market contexts and above all by culture. Technical criteria tend to be of less importance". According to Moulton & Lapsley (2006), wineries are divided into production-oriented and marketing- oriented, which is presented in Table 2.

Table 2: Types of wineries

Production-oriented wineries	**Marketing-oriented wineries**
High production costs	Low production costs
Low product cost	Price-sensitive products
High product quality	Value orientation
Product source is important	Product origin is not of great importance
Production quantity is limited by quality	Production quantity is limited by demand
Quality/trademark relation	Price/Trademark Relation
Low-cost ways of sales and marketing	High-cost of sales and marketing

Source: K. Moulton & J. Lapsley, Successful Wine Marketing 2006, p. 100.

The eminent author, Spawton (1990) contends that the major influences on wine purchase decision are: perceived risk; product cues such as brand, label and price; product experience and knowledge; and the product-use situation. This implies that an understanding of what quality means to consumers offers the promise of improving brand positions through more precise market segmentation, product planning, promotion, and pricing strategy (Zeithaml, 1998).

Due to the fact that the wine industry has entered a stage where just making good prodicts is not enough to grow the market, producers offered a wide choice of wines available for consumers and wineries need to move from a production orientation to a marketing orientation based upon understanding the consumer (Thomas, 2000). Consumer perceptions of price, quality, and value are considered to be pivotal determinants of product choice.

Results and discussion

Research indicates that majority of wine from Kosovo and Metohija is sold through supermarkets and other large retailers. However, this is not an ideal marketing channel for smaller wineries, as they cannot supply the required volumes and compete with larger brands. Larger wineries are more focused on the production of prestigious and quality wines (Nella & Christou, 2014). Geographic branding has become an important strategy for economic actors to differentiate their products (Patel-Campillo&DeLessio-Parson, 2016).

In the conditions of the current economic crisis and dynamic and highly competitive economy, the majority of research on the direct marketing of wine has focused on the digital marketing. Due to the rapid development of e-commerce, the engagement in direct sales with customers is much easier. Husain et al., (2008) suggested that small wineries should exploit technology to establish direct contact with wine consumers and they can benefit through using internet technologies to sell wine.

For a successful marketing of wine, individual wine must be unique in taste, to clearly indicate the region from which it originates in order to become easily recognizable to consumers. However, the major concerns of the wine producers from Kosovo and Metohia are no longer related to the improvement of the technical-qualitative aspect of their product, but rather to knowing in advance the nature of an expanding and increasingly volatile demand and what the direct competitors are able to offer. In addition to the issue of wine marketing and with insufficient and incomplete knowledge of concepts of internet marketing, advertising and branding, the producers particularly highlighted the following problems in operating of wineries in Metohija region:

- ✓ Double taxation, double excise,
- ✓ Kosovo's purchasers carry out extortion in price, and money is paid out in May next year. This could be prevented by Serbian government, so that money can be given to producers immediately after the purchase. For this reason, the Albanians prefer to sell grapes to the Serbian producer.
- ✓ Provisional Institutions in Kosovo and Metohija encourage wineries with €1000 per hectare of vineyard a year, while according to the Serbian producers, the relevant ministry and authorities of the Republic of Serbia have so far granted loans with stimulating interest and donations in presses, crushers, vats, etc.
- ✓ For now, there are no incentives for wine production in Serbian environments and exports, which should be done, especially in the circumstances in which people from Kosovo and Metohija live.
- ✓ In 2015, the purchase price of grapes was 26-30 cents for "Vranac" which is predominantly purchased because it is good for mixing, blending, etc.
- ✓ The selling price of white and red wine in plastic bottles is 150-190 dinars per litre,

- ✓ The selling price of white and red wine in a glass bottle of 0.75 litres is 4 - 4.5 euros (38 cents per bottle, 50 cents per cork, 10-12 cents per labels and transportation, the price depends on the destination).
- ✓ Export of plastic and glass bottles is mostly done, in small quantities from 20 to 40 bottles in vans and buses, but not in tanks due to problems with the Kosovo police, sanitary inspection, etc.
- ✓ "Navip" from Serbia gave a bid to buy the entire wine production for 55 cents per litre, but the owner of the Antic winery rejected the bid because it was not profitable.

Conclusion

The utilization of digital marketing (electronic platforms and digital devices) can facilitate the promotion of a particular wine brand. This study tried to show how Kosovo has done great job following global trends of digitalization, but it still lacks in utilizing this market for marketing reasons, staying closer to the customer and satisfying their needs. Opportunities for wine promotion using digital marketing would benefit customers, since today, a crucial success factor for business is to follow consumer trends and satisfy customer needs while being there wherever the customer is. The current economic crisis and the complex situation in Kosovo and Metohija region force wine producers to differentiate their products using different marketing strategies, such as production-oriented and marketing-oriented. Many wine producers use the brand strategy as one of the possible marketing strategies. In particular, building zour own brand is important for those wineries who want a breakthrough on a foreign market. The findings indicate that winery owners from Kosovo and Metohija region have severe problems with the benefits of digital marketing due to a specific living and business conditions. They are not adequately familiar with the advantages of Internet marketing and are unable to use these comparative advantages because of poor internet connection. The results of a studious research given in this paper indicate that one of the solutions to the problem is the introduction of the concept of Internet marketing, advertising and branding that requires additional effort from small and medium-sized enterprises, both in terms of investments and in terms of the competencies they have to build in order to comply with complexities which this topic brings. It is, also, evident that producers are faced with increased competition, since global wine production is in expansion, and it is expected that the introduction of alcohol abuse prevention law shall come into force. This will significantly contribute to the winery's business performance, as well as it will lead to future customer satisfaction.

The results of the research presented in this paper confirmed the hypothesis that the brand, image and label are very important factors in purchasing wine. The findings show that a design of a particular brand is an extremely important factor for the success of winemakers. When purchasing a particular wine brand, previous experience, friends' recommendations and internet reviews, as well as geographical origin and image of brand are of great importance.

Presented research results in the analysis of users' attitudes towards internet advertising round the world generally differ. Some relevant studies have shown that users have a positive attitude towards internet advertising. The majority of research papers emphasize 3 factors that have major influence on creation of attitude towards internet advertising or online ads: the quality of being informative, entertaining and striking. The qualities of being interactive and credible were also mentioned. Some well-known authors point out that users have different attitudes towards different forms of online ads, i.e., users finds some form of online ads more appealing than others.

Although it is difficult for owners of small and medium-sized wineries in Kosovo and Metohija region to use advanced technologies and advertising tools due to lack of financial resources, it is still necessary to include methods and strategies of digital marketing in order to solve the problems with wine promotion and sale.

Conflict of interests

The authors declare no conflict of interest.

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FACTORS OF SUCCESS AND MOTIVATION OF RURAL ENTREPRENEURSHIP IN EASTERN SERBIA

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ABSTRACT

This study examines success factors and motivation of entrepreneurs in the rural areas of the Eastern Serbia. The survey of the eighty entrepreneurs in the two municipalities has been conducted on the Zaječar district territory, and it included 14 villages. The weak economy, the depopulation process and the lack of financial sources are identified as problems, while the hard work and the quality of the products (services) are crucial success factors. On the other hand, political involvement had the lowest significance as the success factor. The results also indicate that the strongest motivators of the researched entrepreneurs were to be one's own boss and to increase one's own income.

Introduction

There have been significant changes (in particular, the demography ones) on the territory of the Republic of Serbia during the recent decades (Cvijanović, 2012). These changes have been noticed in regard to the movement of the people from the rural areas to the big towns in the search for work and better life conditions, when we compare the current tendency to the earlier one during the previous decade. There has been put an end to the migratory processes, or has, at least, been made slower the movement of the people who live in the rural areas into towns and cities. In spite of the fact that there has been a lot of research work on the different aspects of entrepreneurship in Serbia (Vukmirović, 2005; Sajfert et al., 2008; Bobera et al., 2014; Bobera et al., 2015; Leković & Marić, 2016), the success factors and motivation that are necessary for the entrepreneurship development in the rural regions and the border regions, have not been sufficiently investigated.

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Entrepreneurship represents a significant element of the economic development (Schumpeter, 1935). It can be defined as ”a proactive and innovative economic activity carried out by an individual or a group of individuals connected by a binding contract” (Maksimović et al., 2016, p. 29). The European Union (EU) gives a strong support to the idea of the rural entrepreneurship and, consequently, provides sustainability of the rural development. The entrepreneurship has thus become the focus of the interest of the authors who do the research on the different phenomena that have related to the rural areas.

Labrianidis (2016) has perceived the entrepreneurship as a means for overcoming the barriers of the development of the rural and peripheral districts in Europe, and, especially, in the conditions of the lengthy economy crisis (Leković & Marić, 2016). Labrianidis has also pointed out what have been the three ways that could help to comprehend the aspects of the rural areas. First of all, the rural area has presented the space community that has relies on the definite economy activites (for example, agriculture and forestry) or it may be the fixed open space (for example, the mountain area). Secondary, one could define the rural area by the numerous social and spatial features; for example, the population density and how distant from the town or the city the rural area is. Finally, the meaning of the term ’rural’ currently often means the social portrait of the reality in the sense of inventing the ideal share of the social organisation on the rural territory. We obviously cannot lead the term ’rural’ down to only agriculture and the use of the nature sources but to the development of the different economic fields. The focus of the discussion of the research of the rural territory should, consequently, be given to the social context and the spatial context. Both of these facors have had an impact on the type and the results of the entrepreneurship activities that relate to the different fields. In a word, there is a need of establishing the relation between the entrepreneurship and the space.

The entrepreneurship success factors have usually been studied and discussed with the use of three variables, such as: (1) the external milieu influence (for example, the level of the industry development); (2) the manager’s abilities and training (for example, the bussiness plan creation); and (3) the psychological and personal qualities of the entrepreneurs. Among the entrepreneurship success factors, that have been most frequently investigated, the following ones should be mentioned: the manager’s abilities, the manager’s education, the manager’s or the entrepreneur’s previous experience and training, the manager`s or the entrepreneurs’ psyhology features and qualities, the net of social contacts and the milieu conditions (Benzing et al., 2009). On the other hand, there has been no general agreement about what people have in mind when they describe ’success’ of any entrepreneurial project. Nevertheless, the duration of the entrepreneur’s work has been considered the most important criterion for the success estimation (Rogoff et al., 2004).

The main theme in the entrepreneurship field has related to the factors of motivation that make people do the entrepreneur’s job. It has been thought that the motivation link between the intention and the work of the entrepreneur (Carsrud & Brannback, 2011). Motives, in fact, reveal ’basic reasons for somebody being ready to change and orient his/her attitudes, intentions and activities what is, in any case, valid with entrepreneurs’

(Bobera et al., 2015). Thus, it has been no surprise that a big number of the done empiric research and the motivation models that have been realized and that have related to the entrepreneurship activities both in the countries in the world (Robichaud et al., 2001; McMullin et al., 2008) and in Serbia (Živković et al., 2009; Stefanović et al., 2010).

Entrepreneurial motivations can by classified into four distinct categories: extrinsic rewards, independence/autonomy, intrinsic rewards and family security (Kuratko et al., 1997). These factors determine the motivation level of entrpreneurs which, in turn, affects their business success (Stefanović et al., 2010). Yalcin and Kapu (2008) also suggested four categories of motives: financial, recognition, freedom and family tradition – the willingness to continue family bussines and to imitate family members. These authors further differentiated among the so-called 'push' and 'pull' factors. The former relates to 'the need to increase family income, dissatisfaction with a salary-based job, problem with finding an appropriate job and the need for flexibility for family responsibilities', and the latter includes the need for independence, self/actuelization, increased status quo and reputation in society (Yalcin & Kapu, 2008).

Two basic kinds of entrepreneurs, depending on what is the motive for starting the entrepreneurial project (necessity and opportunity), is possible to recognize (Bobera et al., 2015). While necessity entrepreneurs start the entrepreneurial projects for necessity, opportunity entrepreneurs tend to profitably use noticed chances. It is clear that the necessity enterpreneurs possess less human and financial capital.

The impact of the relevant factors upon the entrepreneurship in the rural areas will be empirically explored within this work. The above presented research question will be studied in the Zaječar border district. This administrative region is made up of the three municipalities (Boljevac, Sokobanja and Knjaževac) as well as the town of Zaječar. The Zaječar District counts 118,295 residents (according to the 2011 Census), covering the area 3,623 km^2. The depopulation process has started when the number of people has reduced for 19,266 (or 14%), compared to the 2002 Census, when 137,561 residents have lived on the teritory of this district. The city of Zaječar has had the lowest depopulation (-11.3%), whereas the higest depopulation has experienced Boljevac (-18.8%). The average population density on this territory is only 33 residents per km^2 and it is far lesser that the average population density in Serbia.

Methodology of the Research

The applied questionnaire in this empirical research represents a slight modification of a highly used questionnaire developed by Chu and Katsioloudes (2001). These authors' questionnaire has been used in the numerous the researches of the phenomena in diferent countries; for example, in Romania, Hungary, Turkey, Ghana and Kenya (Benzing et al., 2005; Benzing et al., 2009; Chu et al., 2007). The first-made questionnaire has been adapted in order to take into account the specific nature of the context that has been chosen for doing the research. For instance, the possibilities for the entrepreneurship development in the rural areas are highly dependent on the development of the companies

and the road network. Consequently, the statements addressing these issues have also included in the questionnaire that has been used for the purpose of conducting a survey oin the fourteen chosen willages.

The prepared questionnaire consists of four parts. The first part of this questionnaire has related to the social-demographic characteristics (gender, age, education and employment status) of the people who have participated in the survey. The second part of the questionnaire is designed in order to obtain the data about a company or a shop such as: the factory setting, the time period during which the firm has worked, the number of people who work in the firm, and the type of the activity that the factory does. The third part of the questionnaire has contained a set of statements dealing with the assessment of the different sucess factors in entrepreneurship activities (both the ones with the internal character and the ones with the external character). In order to rate the opinions of the respondents who have taken part in this survey, the answers to the questions in the questionnaire were offered according to the Lickert's scale. Consequently, the modalities of the answers have expressed the next meanings: 1 - *I do not agree at all*, 2 - *I do not agree*, 3 - *I am not sure*, 4 - *I agree*, and 5 - *I absolutely agree*. At last, the fourth part of the questionnare has contained a list of statements relating to the reasons that could be the motives for being an entrepreneur and the process for starting the entrepreneurship activities in the village. Ninety entrepreneurs have participated in this survey, and eighty-five questionnaires, or 94,44%, were correct.

Results and Discussion

Descriptive statistics belongs to the group of the statistics methods that includes the processes of gathering, calculating, indicating and describing the basic features of the statistics series. Firstly, the data about respondents are given (Table 1). The upper part of this table presents the data dealing with socio-demographic characteristics of chosen respondents. The next part of this table indicates the data that relate to the time period of doing the activity as well as the kind of activities that the entrepreneurs who have participated in answering the statements in the questionnaire do.

Table 1. Data about the respondents who have participated in the survey

	Categories	**Number**	**Percent**
Gender	Male	59	69.41
	Female	26	30.59
The years od age	Up 20 years	0	0.00
	From 21 up 30 years	2	2.35
	From 31 up 45 years	45	52.94
	Od 46 do 60 years	36	42.35
	61 years and more	2	2.35
Education	Without any school	0	0.00
	Primary	0	0.00
	Secondary school	73	85.88
	College	8	9.41
	Bachelor of Art	4	4.71

	Categories	Number	Percent
The period of time that the company (the firm) has worked	Up 10 years	34	40.00
	From 11 up 20 years	44	51.76
	Over 20 years	7	8.24
The activity (work) that the company does	Trade	54	63.53
	Hotel and restorants Management	19	22.35
	Handicrafts as the production activity	7	8.24
	Handicrafts as the, serving activity	5	5.88
	Traffic	0	0.00

Source: Authors' calculastions

The presented data show that more men that women-fifty-nine men, or 69.41%, have taken part in the survey (Table 1). The vast majority of respondents are those of the age between 31 and 45 years (forty-five of them, or 52.91%); then come those between 46 and 60 years old 36 respondents, or 42.35%). In terms of educational level of the surveyed entreprenuers, the largest share has consisted of those who have completed the secondary school; 73 respondents (85.88%). More than half of them (51.76%) has done the entrepreneurship job beetwen 11 and 20 years.

The surveyed entreprenuers were mostly (54 or 63.53%) involved in the trade jobs make up 63.53%. During the field research no activity could be recognized as an effort to develop some aspects of tourism in the contryside. This might be a worrying observation having in mind that this area is reach in the touristic attractions. On the other hand, it is not surprising that there are so many employees who do the trade job, what is in accordance with the newer research in the field of the rural economy. For example, according to the 2005 Census, the largest portion of the rural population who have a job has done the agriculture job (45%); then, food-processing (16%), trade (10.2%), 5.8% civil engineering, 4% transport and state administration education, health care and public welfare (3%) (Bogdanov, 2008, 95-96).

Factors of Success in Entrepreneurship

The average values have been calculated up for every statement separately (Table 2). They have been presented in the questionnaire and they have related to the attitudes on the sucess factors in the entrepreneurship. The obtained data on the success factors were, largely, in accordance with the results presented in the similar studies, and they also involve some investigations that have been carried out in Serbia (Stefanović et al., 2010). Namely, the reliability of measurement instruments used in our study has been very high, compared to the value of Cronbach`s Alpha factor (0.750), that has been recently reported (Stefanović et al., 2011).

The average values, that have been obtained and that referred to the statements from the questionnaire, have approximately been between 3.65 and 4.84, whereas the entire average value has been 4.13. The lowest average value has been referred to the statement Q16 (the involvement into the politics), whereas the highest values have been obtained for the two

statements: Q10 and Q11, the hard work as a success factor in the entrepreneurship and quality of the good service, respectively. Within this section, attention will be paid to the statements Q3, Q5, Q10 and Q16.

Table 2. Descriptive statististics of data

Statement	Mean Value
The bigger and closer to the town or the city the village, the greater the (chances) possibilities for the success in the small business firms (Q1).	4.22
The work of the big company in the village is suitable for the development of the small family firms (Q2).	3.72
The adequate measures that the state could introduce, could improve the entrepreneurship in the village district (Q3).	3.84
The training programmes that relate to the way we could start and lead the business in the village would be usefull (Q4).	3.96
Having the approach to the funds has a big importance for the entrepreneur who lives in the rural area (Q5).	3.71
The success achievement of somebody doing the small business is greatly dependent upon the previous experience of the entrepreneur (Q6).	4.09
The family support and the friend's support is specially valuable for the work of the entrepreneur who lives in the village (Q7).	4.38
The introduction of other people to one's own work has an impact on the small business (Q8).	4.09
The entrepreneurs as the owners of the firms in the rural areas should also insist on the quality of a product or the services that have the appropriate price (Q9).	4.14
A good service is very important for the business success (Q10).	4.69
Hard work is the necessary condition for the success in the field of entrepreneurship, especially in the village (Q11).	4.84
If the village is nearby the highway it has a suitable impact on the work of the small entrepreneurs who live in the rural areas (Q12).	4.49
The good manners of handling the business books leads to the success of a firm (Q13).	4.11
A good entrepreneur should know how to play, organize and control the work of the employees (Q14).	4.24
The entrepreneur's good social contacts are more than useful when we talk about the rural district (Q15).	3.94
The entrepreneur's involvement into the work of politics parties could make easier the way to the bussiness success (Q16).	3.65
The more intensively developed agriculture in the villages would have a beneficial effect on the conditions that could enable the entrepreneurship development in rural area (Q17).	4.08

Source: Authors' calculations

In terms of the statement Q3, *The adequate measures that the state could introduce could improve the entrepreneurship in the village*, one can say that 75.29% respondents have agreed with this statement, 18.82% respondents have not been quite sure about the claim, and only 1.18% has not agreed with the statement that says the suitable measures that the state could introduce, could induce the entrepreneurship development in the villages. In

spite of the fact that the success factors have been approximately assessed in many developing states, certain differences (besides the influences of economy and culture) could be attributed to the impacts of politics. The state impact upon the entrepreneurship development might, for example, be threefold: the productive impact, the non-productive impact and the destructive one (Minniti et al., 2008).

With the statement Q5, *Having the approach to the funds has a big importance for the entrepreneur who lives in the rural area*, three fifths of the respondents (60.00%) have agreed, 7.06% of them have absolutely agreed with the statement, 29.41% has not been sure about it, whereas 3.53% have not agreed with this claim. In this case, the average value equals 3.71, what is somewhat lower value than those obtained in recently conducted similar studies that has been done in Serbia and other countries of the Western Balkans. This result is partly likely to be ascribed to the specific economy conditions that exist in the countryside, relating to the involvement of more than one generation into the bussiness the process of combining the different salary sourcess (both the agriculture salary sources and the non-agriculture salary sources).

The Zaječar district, for instance, along with Braničevo (25.56%) and Bor (17%) districts, has had a high participation of emigrants in the population, and, therefore, households in this part of Eastern Serbia receive a significant share of the remittances abroad. Yet, the high share of remittances in the average income does not necessarily mean that remittances substantially contribute to the entrepreneurial development. On the other hand, Petković (2017) has recently indicated that in Eastern Serbia the inflow of remittances has reduced only the poverty index.

The statement Q10, *A good service is very important for the business success*, has been absolutely supported by exactly 69.41% people whereas 30.59% people have agreed with this statement. What is worth mentioning is the fact that the factor Q10 is the second factor according to the importance it has for the entrepreneurship success (the mean value is 4.69). The good service quality, or the good product quality, has had the highest value in similarly conducted research; let us say, 4.85 (Stefanović et al., 2011). The above claim can be regarded as a good indicator for the presence of the entrepreneur's spirit in the rural milieu.

The statement Q16, *The involvement into the work of the politics parties could make easier the road to the business*, absolutely supports a slightly more than one-third of the respondents (34.12%). Some respondents (10.59%) have agreed with the statement, the other portion of the sample (45.81%) has not been sure about the the truth of the statement. At last, some respondents (9.41%) have not agreed with the statement that the involvement into the work of the politics parties could make easier the way to the the bussiness success.

These results, in regard to the statement Q16, have been in accordance with the previous research on the success factors in Serbia. As it has earlier been presented (Table 2), the very factor of the entrepreneurial success in the rural district has been valued the lowest value (3.65), and this fact has been in accordance with the results that have once been obtained using 79 both small and big firms. Then, the variable that has said 'the participation in the politics life', having been one of the analyzed factors of the bussiness success that has

been graded the lowest value (1.94) (Stefanović et al., 2011). What has been interesting here, it has been the fact that the success factors have been graded by the people who have answered the questions in the questionnare the lowest value, in spite of the well-know fact that there has been a very serious link between the involvement into the politics life and the bussiness world in Serbia, as well as in the other states that have been going through the process of the economics transition.

Finally, with the statement Q17, *The more intesively developed agriculture production in the villages would have a more suitable impact upon the development conditions*, 11.76% respondents, who have participated in the study, have absolutely agreed with the statement, whereas 85.88% of them have agreed.

Motivations in Entrepreneurship

The fourth group of questions has related to the reasons that could enable start the business in the village areas. The answers of the respondents who have participated in the survey have been shown (Table 3). As it can be seen, only 2.35% respondents has declared that they would live to build up the business that could inherit their descendents, 35.30% of them has said that they would like to ensure the safe jobs for their family members, and the majority (62.35%) has said that they would like to start and to continue a safe job for themselves.

The results that have been presented in the chart 6 are also in accordance with the similar research results. That is 'to ensure the safe business', that is the most important motif for 53 people when compared to the opinion of 85 respondents, who have participated in answering the questions in the questionnaire, has been seen as a very serious motiv in the study that has been done as well (Stefanović et al., 2010). The factor has been given the average value 4.56, that is slightly lesser that the value 'for making profit', which is 4.63 and the value 'the abilities that relate to the use of the previous experience and education' that is 4.58 (Stefanović et. al., 2010).

However, whereas the motifs 'to ensure the job for the family members' and 'the family closeness', that have been mentioned in the project, have been valued as the motives with the values 3.18 and 3.39, respectively, the results that we have obtained in this study show that the motif for starting the business has been given a very high, second place. The obtained data that have been gathered should certainly be looked at from the point of view of the respondent's effort who do the jobs in the field that the migratory processes from the village to the town should be slowed down. Also, the economy instability has forced the entrepreneurs to start taking care of themselves as well as their family members.

Table 3. The reasons for starting business in chosen villages

Value	Frequency	Percentage	The cumulative percentage
a. To achieve earning a high salary	0	0.00	
b. To start and continue the safe job	53	62.35	0.00
c. The ensure the jobs for the family members	30	35.30	62.35
d. To create the ability to realise the personal abilities and experience	0	0.00	97.65
e. To be my own boss	0	0.00	97.65
f. To start the business that (I could pass on descendents) my descendents could inherit	2	2.35	97.65
g. To have my own personal freedom	0	0.00	100.00
h. To create with the help of my business the conditions that could enable my descendents stay on the household	0	0.00	100.00
Total	85	100.00	100.00

Source: Authors's calculations

The motif for starting the safe business, as well as the opening of the work places for the family members, is dependent upon the cultural features. The results of the new research of the motifs that relate to the starting up the business have shown that the family factors have been highly visible; for example, in Turkey (Ozsay et al., 2001). On the other hand, the job safety has proved out to be the most important motif for the starting of the business in Romania (Benzing et al., 2005).

The Specifics of the Entrepreneurship in Rural Settlements

It has also been done the research wheather the entrepreneur's spirit has been more visible when we have in mind both the number of the employees and the differences. For example, if there are firms with a bigger number of employees in the villages (for example, *The Agricultural Company* in Salaš, or *The Transformers Production Company* in the nearby village of Zvezdan), that have been present in the entrepreneur's life in the area, this can have the influence on the difference in the entrepreneurship development as well as the gender diference among the employees in the village. The review of the companies in chosen villages is given (Tables 4 and 5).

Table 4. Companies working in chosen villages on the Zaječar City area

Place	The complete number of companies	Men	Women	The complete number of employees
Grljan	9	17	9	26
Veliki Izvor	16	12	12	24
Rgotina	10	67	31	98
Zvezdan	10	175	29	204
Vražogrnac	8	8	9	17
Lubnica	3	1	5	6
Salaš	22	113	58	171

Source: Authors

Table 5. Companies working in chosen villages of the Knjaževac Municipality

Place	The complete number of companies	Men	Women	The complete number of employees
Minićevo	16	18	15	33
Kalna	8	6	10	16
Podvis	3	98	15	113
Donja Kamenica	3	2	1	3
Štrbac	1	0	1	1
Berčinovac	1	3	0	3
Repušnica	0	0	0	0

Source: Authors

During the analysis of the assembled data, it has been noticed that the entrepreneurship spirit in the bigger villages nearby the municipality centres has mostly been developing as the family bussiness in the field of the mixture shops and firms. Grljan is, for example, when we make the comparison among the 14 villages that the research has involved, the village with the bigger population and it is located in the very vicinity of the municipality centre. At the beginning the very shop and firm owners have been the owners of the shops and firms. The more developing the bussiness has been, the bigger the need for the opening of the new work positions. Thereby, the employers have, firstly, employed their own family members. It has been only later that the employment process involving other people who have lived in the village has thus, in due course, created the family business concerning the mixed shops villages. The smaller opportunities of finding a job in the municipality centre has had impact upon the process of staying in the villages and doing the job that could involve the entire generation of families in the village.

This field research has confirmed even the assumption: *The better the traffic position of the village the better, the possibilities for the entrepreneurship development in the village are*. Having this fact in mind, several villages stand out: Salaš, Rgotina and Minićevo. They are situated on the higway E771 (Romania)–Kladovo–Negotin–Zaječar–Niš. The possibilities for the entrepreneurship development are better than the possibilities in the villages that have been separated from the highways and inaccessible and impassable in the winter season months.

Acording to the data that have been presented, what can be seen is that there have been 16 companies in Minićevo, what has been twice the number than, for example, in Kalna, where there have been 8 firms. On the other hand, there have been opened only three shops in Donja Kamenica, that is a shop in Štrbac. These places, unlike Minićevo, are situated by the local road Knjaževac–Pirot via Kalna, the road that has the less travel frequency.

Conclusion

The entrepreneurship on the territory of the Zaječar district has for decades been in the shadow of the big bussiness systems, that has resulted in the dependence of the entrepreneurship development of the big companies. Their disappearance and the process

of leaving the 'shadow' of the big firms has had as a consequence the opening of the micro companies. The small firms as well as the middle-sized firms, the basis of the entrepreneurship have made, first of all, place the micro firms. The obtained results have shown that mostly men decide to do the research projects, and when we talk about the entrepreneurs people who are between 31 od 45 years old have prevailed. The vast majority of entrepreneurs has graduated from the high school, whereas the time period that they do the job has mostly been up to 10 years, the trade being the dominant business branch. Among 17 factors of the entrepreneurship success that have been investigated, the most highly valued factors of the entrepreneurs' success have been the hard work and the good service quality, whereas the involvement into the politics life had the lowest value. Finally, on the basis of research dedicated to the reasons to start entrepreneurship it can be concluded that providing the safe, long-term job is the most important factor, and, then, ensuring the work for family members.

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Conflict of interests

The authors declare no conflict of interest.

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VALUE RELEVANCE-EVIDENCE FROM FOOD INDUSTRY

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ABSTRACT

The aim of the paper is to determine the correlation between the changes in the values of the selected analytical indicators, based on the financial statements and the change in the market value of companies, expressed through the value of the market value multipliers. The focus of research is on companies operating on the European markets within the food industry. The research methodology implies the use of regression analysis where the market multipliers of the selected enterprises will be set as dependent variables, and the analytical indicators are proposed as independent variables. The expected results should indicate the existence of value-relevant information in the financial statements of companies from food industry, which will serve all stakeholders for more efficient decision-making that is related to this industry sector. Data used in the research are acquired from European equity markets.

Introduction

Modern business conditions include the need for making various business decisions in a dynamic environment. When business decisions are related to lending, mergers and acquisitions, strategic separation of companies, privatization and other similar transactions involving the exchange of parts or entire enterprises, managers most often rely on valuation models as a basis for deciding on the value of the company. Trends in practice speak in favor of the fact that there are more and more of these types of transactions and that there is a need to find out how changes in daily operations cause changes in the market value of the company. Value relevance of accounting information implies a close connection of balance information with the movement of the market value of companies. Starting from the analysis of fundamental valuation models such as discounting cash flow or dividend models, it can be concluded that the company's market value base stems from its long-term ability to generate positive cash flows and profits, reduce business risk and create conditions for continuous growth (Nissim, 2011).

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In this context, as determinants of company's value we can recognize all activities that lead to such conditions and which are financially manifested through the balance sheets and analytical indicators that are value relevant.

The question arises: what are generally accepted analytical indicators that are said to be value relevant? And do they apply equally in different industries? Or how do they explain the value of the companies operating in the food industry? Analytical indicators based on accounting information are the basic tools for analyzing and planning business. The informative value of the accounting information contained in the analytical indicator determines its quality and usability in the decision-making processes. If we return to the fundamental valuation models, the value relevance would be linked to analytical growth, risk and profitability indicators as the basis for creating a new value.

The main goal of the empirical research is to present analytical indicators that are value relevant within the food industry sector. The aim is to demonstrate a statistically significant correlation between the movement in value of the selected analytical indicators and market value of the companies, on a sample of companies from the food industry sector.

Value relevance is being defined as the ability of information disclosed by financial statements to capture and summarize firm value (Sibel, 2013). Value relevance refers to the usefulness of using financial statements from the perspective of the owner of the capital and other interested parties who want to find out the value of the company (Sakovic, 2018). Value relevance implies the correlation between the accounting information disclosed in the financial statements (egg accounting data, cash flow indicators and other analytical indicators) and market values of company (market capitalization and other market indicators). Greater correlation implies greater value relevance of specific information. If there is no link between the balance sheet and income statement positions and the value of the company, there is no value relevance, and the financial statements in this case do not fulfill one of their basic purpose. Value relevance of accounting information varies depending on the development of institutional infrastructure and is usually more significant in countries with the higher degree of economic development (Ali, Hwang, 2000).

In financial theory, there are several interpretations of the meaning of value relevance, depending on the context of its use, the importance in determining the market price of shares and decisions on them.

One point of view analyses value relevance from the perspective of the use of accounting information in deciding on the purchase or sale of publicly available shares. According to this viewpoint, information is value relevant if it changes the overall information base on the market, or if traders actively use it on the market when making investment decisions (Collins, Maydew, Weiss, 1997). In doing so, traders are guided solely by publicly available accounting information from the balance sheet and income statement of the company (Ball, Brown, 1968).

Another viewpoint where value relevance is viewed from the perspective of the valuation models, implies that accounting information is value relevant if it helps in predicting the values that are necessary in analysis of traditional valuation models (Chang, 1999). For example, accounting information is value relevant if it has the ability to anticipate future free cash flows or dividend payouts when it comes to the discounting cash flow or the discounting dividends model respectively (Brief, Zarowin, 1999).

The third interpretation of value relevance does not focus solely on accounting information and their ability to predict market values and market indicators. According to this understanding, value relevance refers to the ability of all types of indicators to capture and summarize all relevant information regardless of their source. This information can be derived from the financial statements, but also from other sources such as plans, specific reports, etc. (Francis, Schipper, 1999).

Another way of explaining the value relevance of accounting data derivates from the valuation models. According to Frankel and Liu (1998), the existence of correspondence of market value with an estimated intrinsic value of an enterprise by any valuation model indicates the existence of value-relevant information in the accounts of that company. Namely, in each valuation model there are certain determinants that determine the value. For example, in traditional yield methods these are free cash flows or dividend yields. In the cost method, this is the carrying amount of assets and liabilities. In multiplier models, these are the balance positions that create the multiplier. Regarding the multipliers model, specifically P/E and P/B models, Cheng and McNamara (2000), concluded that profitability rate and the book value of capital are value relevant

Authors Pervan and Bartulovic (2014) concluded that accounting information, i.e. book value and earnings are value relevant. They conducted research on the sample of companies from Southeast Europe. The analysis of regression and determination coefficients has shown that on the observed capital markets value relevance of book value is higher than value relevance of earnings.

Confirming the value relevance of information used in valuation models arises from the accuracy of the estimation of these models. If the result of the assessment of a model is a properly established value of the company, it is considered that the information which is used is value relevant because it has led to the correct intrinsic value. Consequently, the value relevance in this case does not only apply to accounting information, but also to all other involved in the creation of the value of the company.

Starting from the model of the market multipliers, Schreiner (2007) presents correlation between the P/E and EV/EBITDA multipliers and traditional yield models, in which way the author highlights which value-relevant information is dominant in multiplier models. Analyzing their mathematical connections (Richter 2005), the author concludes that there are similarities in the basic determinants of the presented models, that is, that the traditional yield and market models are based on the same fundamentals, which are lower business risk, opportunities for achieving growth and higher profitability. Richter concludes that market multipliers represent the mathematical alternative for traditional yield methods (2005).

Table 1. Correlation-multipliers and yielding models

	P/E	EV/EBITDA
Method	*Discounted dividend model*	*Discounted Cash Flow model*
Model formula	$V_t^{equity} = \sum_{i=1}^{\infty} \frac{D_{t+i}}{\left(1+r_{t+i}^{equity}\right)^i}$	$V_t^{entity} = \sum_{i=1}^{\infty} \frac{(FCF_{t+i})}{(1+r^{wacc})^i}$
Adjusted formula	$V_t^{equity} = \frac{D_{t+i}}{r^{equity} - g^D}$	$V_t^{entity} = \frac{FCF_{t+1}}{r^{wacc} - g^{FCF}}$
Connection with the multiplier	$\frac{V_t^{equity}}{NP_t} = \frac{PR \times (1+g^{Np})}{r^{equity} - g^{Np}}$	$\frac{V_t^{entity}}{EBIT_t} = \frac{(1+g^{FCF})(1-tax\ rate) \times \left(1 - \frac{g^{FCF}}{ROIC_t}\right)}{r^{wacc} - g^{FCF}}$

Source: Schreiner, 2007

Analysis of the joint determinants of traditional yield models and market multipliers shows that growth rate, risk and profitability are value relevant. This raises the question of what are the most representative analytical indicators of growth, risk and profitability and whether they have the explanatory power when analyzing the values of the companies from the food industry. Within the empirical research, using a financial analysis, standard analytical indicators were derived and tested for value relevance.

Materials and methods

The aim of the empirical research is to examine the correlation between the selected analytical indicators and the value of individual multipliers for companies operating within the food industry. The task is to determine a group of analytical indicators for which it can be said that significantly explain the value of the company expressed through the value of market multipliers. Methodological steps that shape empirical research include the following steps:

1. collecting financial statements of all companies from the sample,
2. conducting financial analysis, calculation and selection of analytical indicators,
3. segmenting selected analytical indicators into the categories of growth, risk and profitability,
4. calculation of P/E and EV/EBITDA multipliers for companies from the sample,
5. setting linear regression equations (models) where the multipliers are set as the dependent variables and the selected analytical indicators are set to be independent variables (according to the research of An, Bhojraj, 2010),
6. testing regression models and displaying results.

To achieve the goals of empirical research a multiple linear regression analysis will be used. The linear model is calculated using the equation:

$$y = a + b1x1 + \cdots + \varepsilon i \quad (1)$$

Where:

y- Company's multiplier

x- Analytical indicator

ε- Model error

b- regression coefficient

Within the research, a series of regression analyzes were conducted to answer the questions how well a set of selected analytical indicators of a company can predict the value of individual multipliers. Each regression analysis refers to one multiplier of value and to the entire set of food industry companies. The aim was to find a model that is best adapted to data, that is, a model that contains only those analytical indicators that have an impact on the value of the multiplier (the optimal number of analytical indicators).

For data processing IBM SPSS 20 statistical software is used. A multiple gradual regression analysis is applied within the research. The contribution of each analytical indicators to the individual multipliers is tested and the regression model is chosen step by step. The aim was to find a combination of analytical indicators that have the highest degree of value relevance in relation to the tested multipliers. The coefficient of determination will show which part of the variance of the individual multipliers can be explained by the model.

The selected analytical indicators that will be tested with regression equations are grouped into three basic groups:

1. Analytical indicators of company's growth.

The growth dynamics is an important determinant of value when the company is evaluated by traditional valuation models, that is, a critical input for traditional discounting valuation models. The theoretical and practical correlation of the company's growth rate with its value does not indicate how the growth can be measured and which analytical indicators can be important for the calculation of the company's growth.

In professional literature, the most frequently used growth rate is based on changes in the most important financial indicators, such as:

- sales
- net income
- total assets, etc.

2. Analytical indicators of risk

In traditional valuation models, the risk of investing in an enterprise (company risk) is expressed through a discount rate, which represents a measure of the expected return on an initial investment, by which future cash flows or dividends are discounted to the present value. The calculation of the overall risk of investing in the company is an integral part of almost all valuation models. In an empirical study, assumption is that the risk of an enterprise can be represented through the values of analytical indicators of financial risk. For this purpose, analytical indicators were selected:

- debt/total obligations
- leverage
- interest rate coverage.

3. Analytical indicators of profitability

Profitability of companies can be measured by profit margins or profitability indicators. Profit margins (rates) represent the ratio of a certain result, net profit, or upper result in income statement and most often sales revenue. Profitability of companies is expressed as the effectiveness of the use of invested capital (assets). The earning power is the best indicator of profitability. This indicator shows the ability of the given investment to discard some kind of yield from its use (Rodić, Lakićević, Vukelić, Andrić, 2011).

The most important profitability indicators are:

- return on assets-ROA
- return on equity-ROE.

The result of the empirical research should be analytical indicators of companies that are value relevant, i.e. for which the regression analysis has established that as a group statistically significant explain the values of individual multipliers.

The sample for the empirical research consists of companies operating in the food industry. The sample contains only companies listed on the European capital markets, for which there are publicly available data necessary for carrying out the survey. The sample includes all countries of the European continent.

The set research problem requires the collection of data from annual financial reports of the company, as well as data from the capital markets such as shares values, achieved sales prices of entire companies, market capitalization etc. The time frame for collected data is 2012-2016. The total number of companies collected in the initial sample is 315, which totals 1,322 observations in the initial sample. After forming the initial sample, some companies were eliminated from the sample. Initially, the companies that have extreme market capitalization values have been eliminated, and after that companies that have not publicly disclosed all the necessary data for conducting the analysis. After all eliminations, the number of observations in the sample was reduced to 1.001. Descriptive sample statistics are shown in Table 2. The sources for collecting the necessary data are the international database Amadeus.

Table 2: Descriptive statistics of the sample-Financial data

In 000 euro	Number of observations	Arithmetic mean	Median	Min	Max
Market capitalization	*1.001*	*1.119.454*	*17.172*	*920*	*78.708.144*
Entity value	*1.001*	*1.324.371*	*27.905*	*300*	*89.490.028*
Total assets	*1.001*	*932.135*	*39.014*	*3.990*	*48.027.000*
Net profit	*707*	*101.667*	*2.261*	*-*	*5.515.000*
Book value of capital	*1.001*	*386.470*	*20.264*	*654*	*22.566.576*
EBITDA	*807*	*119.566*	*3.036*	*-*	*9.140.000*

Source: The authors calculation

Selection of the company was based on the classification according to the international classification of economic activities (NACE Rev.2-Classification of Economic Activities). Under this classification, companies are classified into different levels: industrial sectors, divisions, groups, classes and subclasses. A sample of empirical research consists of companies that have a sectoral label beginning with "1" and which includes the following groups of companies belonging to the food industry:

Table 3: Food sector groups

Description	Group of companies (3-digit company code)	Sector
Production of meat and meat products	101	Production-Food industry
Production of fish	102	
Production of fruits and vegetables	103	
Production of food fats and oils	104	
Production of milk products	105	
Production of mill products	106	
Production of pasta	107	
Production of other food products	108	
Production of water, juice and other soft drinks	110	

Source: The authors presentation

Results and discussion

Pearson correlation was used to examine the relations of the P/E ratio and the EV/EBITDA multiplier with the company's growth variables (assets, sales, net income), company risk (debt/liabilities, leverage, interest rate coverage) and profitability (ROE, ROA, Profit Margin). Test results are shown in the following table.

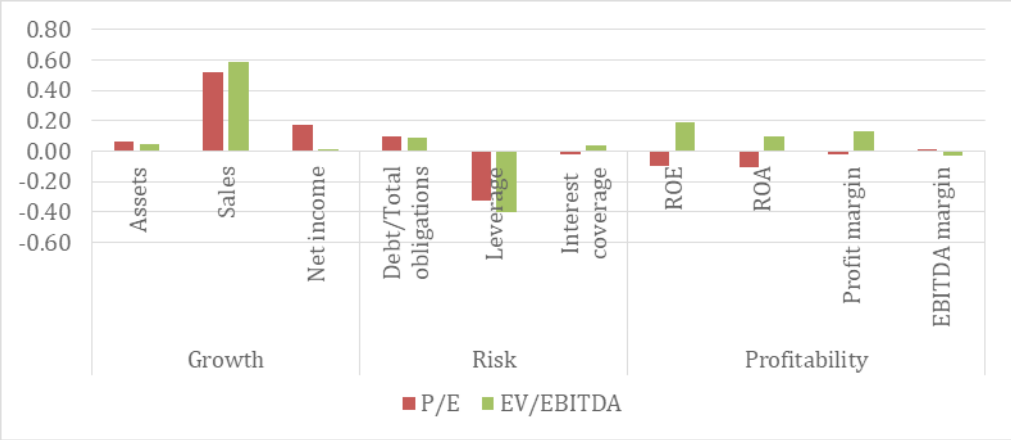
Table 4: Correlation-Analytical indicators with multipliers

P/E	Growth			Risk			Profit			
	Assets	Sales	Net income	Debt/ Total obligations	Leverage	Interest coverage	ROE	ROA	Profit margin	EBITDA margin
Pearson's correlation	0,06	0,52	0,17	0,10	-0,33	-0,02	-0,10	-0,11	-0,02	0,01
Significance	0,000	0,000	0,000	0,000	0,000	0,004	0,000	0,000	0,581	0,783
No. observations	1.001	1.001	707	1.001	1.001	954	1.001	1.001	702	807
EV/ EBITDA										
Pearson's correlation	0,05	0,59	0,01	0,09	-0,40	0,04	0,19	0,10	0,13	-0,03
Significance	0,037	0,000	0,005	0,000	0,000	0,441	0,000	0,15	0,000	0,014
No. observations	807	807	707	807	807	807	807	807	707	807

Source: The authors calculation

Based on the results, it can be concluded that growth variables positively correlate with both multipliers and that the highest linkage is with variable income growth. Variables that describe risk correlate negatively with the P/E multiplier, or mostly negatively when it comes to the EV/EBITDA multiplier. In this group, only the leverage variable is significant. Variables that describe profitability behave differently within groups. The thing they have in common is that connections are lower than is the case with other analytical indicators.

Figure 1: Correlation of analytical indicators with P/E and EV/EBITDA multiplier



Source: The authors presentation

In accordance with the previously presented correlations, variables have been selected whose influence on multipliers is further investigated. These are the variables that best correlate with both multipliers. In this way, the variables that give the best contribution to the explanation of the value are selected for further analysis. The overall sample

shows that best fitted variables are sales growth and leverage, with the note that for the EV/EBITDA multiplier a few analytical indicators of profitability are also significant. Descriptive statistics for variables of importance are given in table no. 5.

Table 5: Descriptive statistics of independent variables P/E and EV/EBITDA

	Min	Max	Arithmetic mean	Standard deviation
P/E	0,00	35,76	13,2353	9,2456
Sales growth	-0,36	0,38	0,0601	0,1308
Leverage	0,00	1,12	0,3976	0,2787
EV/EBITDA	0,01	27,56	9,0543	6,0423
Sales growth	-0,35	0,36	0,0587	0,1398
Leverage	0,00	1,24	0,4776	0,2598

Source: The authors calculation

In separate regression analyzes, it was investigated whether and to what extent changes in sales growth and leverage can predict the value of P/E and EV/EBITDA multipliers. Multiple regression analysis was applied, in which independent variables were income growth and leverage, while dependent, variables P/E and EV/EBITDA multipliers. There is no multicollinearity between independent variables, which was tested with Pearson's correlation.

The results of regression models indicate that the predictive set of independent variables describes 43.2% of the P/E multiplier variance. Given the large number of cases involved in the analysis, the adjusted coefficient of determination is equal to R^2 itself. In table no. 6 are presented the indicators of the regression model.

Table 6: P/E multiplier-indicators of the regression model

Model	R	Determination coefficient (R^2)	Adjusted R^2
1	0,657	0,432	0,432

Source: The authors calculation

In table no. 7 are given individual contributions of the predictor variables included in the P/E regression model. From the date presented it can be concluded that both independent variables predict the criterion statistically significant. This criterion is predicted in a positive direction by the sales growth, while the risk variable, leverage, predicts P/E multiplier with the negative direction. The contribution of these two variables is almost identical, which can be seen based on standardized beta coefficients.

Table 7: P/E multiplier-contribution of individual coefficients

Model		Non-standardized coefficients		Standardized coefficients	T	Significance
		B	Stand. error	Beta		
	(constant)	19,23	0,219		87,353	0,000
	Sales growth	29,36	0,849	0,418	34,355	0,000
	Leverage	-14,41	0,417	-0,427	-35,119	0,000

Source: The authors calculation

Regarding EV/EBITDA multiplier, regression model indicates that a set of independent variables explains a large percentage of variance of the dependent variable. More precisely, more than one half of the variance EV/EBITDA multiplier was explained by the set of variables income growth and leverage. In table no. 8, shown below, indicators of the regression model can be seen, as well as the percentage of explained variance.

Table 8: EV/EBITDA multiplier-indicators of the regression model

Model	R	Determination coefficient (R^2)	Adjusted R^2
1	0,712	0,507	0,507

Source: The authors calculation

The contribution of individual independent variables to the EV / EBITDA multiplier on the total sample was also examined. The obtained results show that both variables, sales growth and leverage statistically significantly explain the dependent variable. Sales growth is driven by a higher contribution that is positively oriented. The leverage variable has a lower, but statistically significant contribution, which is negatively directed. Table no. 9 gives the individual contribution of all predictor variables included in the regression model.

Table 9: EV/EBITDA multiplier-contribution of individual coefficients

Model		Non-standardized coefficients		Standardized coefficients	T	Significance
		B	Stand. error	Beta		
	(constant)	12,398	0,157		73,744	0,000
	Sales growth	25,178	0,577	0,532	43,399	0,000
	Leverage	-7,945	0,280	-0,332	-28,088	0,000

Source: The authors calculation

The results obtained by empirical research are in line with the basic starting point of traditional valuation models, which also value the company based on the growth, risk and profitability of the company. The determination coefficients for both models tested confirm, in the case of the food industry, the correctness of the assumptions that are stated in the literature as drivers of value of companies (Pervan, Bartulović, 2014). The presented results related to the food industry represent a specific upgrade to the previous studies that dealt with this topic considering other industries (Brief, Zarowin P, 1999).

What arises as a question and as a recommendation for future research is the role of specific value factors that are related to the food industry and whose involvement would result in further improvement of research results. Such factors could be in relation with production, sales, brand management, market conditions etc. Creating value in the food industry in any case relies primarily on internal generators, but new researches could summarize the existing internal factors from this research with the external economic trends related primarily to the food industry and then measure value relevance of all gathered information. This would enable all stakeholders to get wider image of value generators of the target company.

Conclusion

The results of the research on the value relevance of accounting information in the food industry indicate the existence of statistically significant links between changes in analytical indicators of growth and risk and the change in the value of market multipliers. Based on the measured coefficients of the determination, it is concluded that the analytical indicators of income growth and leverage are value relevant in relation to the P/E and EV/EBITDA multiplier. The results presented refer to the research of value relevance carried out at the level of all the companies from the sample, without their segmentation into subgroups of the food industry. Additional analysis covering only listed subgroups have very similar results previously presented. Consequently, it can be concluded that the results of the survey as the whole are related to each subgroup of the food industry with the same level of significance.

The presented results will enable all interested parties to understand better the drivers of value in the food industry and thus make more rational business decisions. These decisions are mainly linked with mergers, acquisitions and different types of corporative restructuring on the organized markets and with the non-listed companies as well. Trending in food industry indicate that there are more and more this kind of transactions, which gives more significance to the results of the research. Following the results of the research acquisition managers in food industry should track and analyze target company's sales growth potential and financial leverage when deciding on value.

Conflict of interests

The authors declare no conflict of interest.

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INTERNATIONAL EXPERIENCES IN COOPERATIVE AUDIT AND LESSONS FOR SERBIA

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ABSTRACT

Basic characteristics of cooperative audit, its role in preservation of cooperative nature and promotion of cooperatives are analyzed in the paper. The aim of this paper is to propose measures to improve cooperative audit in Serbia based on the review of good practice in European countries.

The development stages of cooperative audit, from the creation of first cooperatives in Europe until today, have been examined using the historical method, with particular emphasis on the legislative framework that regulated this field. The comparative method was used to determine the differences between individual solutions, emphasizing their advantages and disadvantages, as well as the potential impact on the development of cooperatives.

The research suggests that there are different solutions, from the absence of cooperative audit, to its inclusion in the cooperative life cycle, starting from its establishment. Although legislative framework in Serbia foresee cooperative audit, this process needs to be significantly improved.

Introduction

The co-operative movement in Serbia evolved in parallel with the emergence of the first cooperatives in the world, going through various stages of ups and downs. Particularly critical stages in the development of cooperatives were in periods when cooperatives were used to achieve certain national, political and other goals, which resulted in the relinquishment of cooperative values and principles and the violation of the core identity of the cooperative. These disorders in cooperative practice resulted in a distortion of confidence in this form of organization of agricultural producers, linking

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the term "cooperatives" with negative experiences and practices, which in the transition period had significantly slowed down the process of revitalization of the cooperative sector. In order to avoid such disorders and waiver of cooperative organizations from internationally accepted values and principles, it is important that cooperative audit is regularly implemented in practice.

The term audit represents a periodical control of the business of economic entities. All types of organizations implement some sort of auditing process. Having in mind that cooperatives distinguish from profit-oriented companies by its establishment, management, business, and objectives defined during its foundation, they require a special type of audit. Different terms are used to describe this process. The term *cooperative audit* is most common, but it is also referred as *revision, control* or *verification*. The term revision is used in the legislation of Austria (*revision*), Italy (*revisione*), France (*révision*) and some other countries, while in Slavic languages, including Serbian, the usual term is "*revizija*".

The cooperative audit is more than a pure financial audit and it looks at a wider set of indicators beyond business performance. One of the main tasks of cooperative audit is to verify compliance with cooperative values and principles, as well as with relevant legislation. Special emphasis in this process is given to the realisation of previously defined goals and particularly to cooperative management and implementation of decisions made by the general assembly, steering committee and supervisory board. That is why the cooperative audit is considered to be an efficient control mechanism which enables cooperative members to exercise their voting rights (Cracogna et al., 2013).

Co-operative audit is a prerequisite for a successful and vital cooperative system. In addition to the control role, the cooperative audit has an advisory role. It is especially significant in cooperatives with a large number of members, because a large membership cannot directly participate in the management of a cooperative, but it is realized through delegates. In such cases, in order to preserve the democratic nature of the cooperative, there is a need for the decision-making system to be transparent, which is controlled by a cooperative audit (Nikolić, 2009).

Cooperative audit needs to obey three principles: independence, credibility and usefulness (Spreckley, 2013). It must be reliable and carried out by an unbiased person, specifically trained for this task. The purpose of cooperative audit is not only to check previously achieved results, but also to help the management and members of a cooperative to improve decision-making processes and business performance in the future and to perform its business according to the cooperative principles.

There are two types of cooperative audit: internal and external. The internal audit is performed by one or a group of cooperative members, usually members of internal management body. In some countries independent experts can also be involved in internal cooperative audit. Their task is to check the financial aspect of business, and management reports, unless the cooperative is subject to external auditing (Cracogna et al., 2013). The external cooperative audit is the higher, second level. It is performed in regular time in-

tervals, usually defined in legislation, and performed by external expert from cooperative union, private audit company, relevant government body or other similar institution.

The timely and regular audit of financial operations, the management and social standing of cooperatives' business is a precondition for a successful cooperative system (Henrÿ, 2012). European cooperative practice abounds in various solutions as to who conducts a cooperative audit, time intervals, reporting methods, procedures after the conducted audit, and the extent to which the adoption of proposed measures is mandatory.

As an exceptionally important factor in the development of the cooperative sector in Serbia, the emphasis should be on cooperative audit, primarily in terms of preventing misuse and manipulation. Restoration of trust in cooperatives, which was largely lost in the post-World War II period, cannot be achieved without a reliable and standardized system of cooperative audit (Zakić, Kovačević, 2015). By comparing the different experiences of European countries, the most important segments of the process of cooperative audit were identified in the paper, and based on this recommendations were made in order to improve this process in Serbia.

Materials and methods

The external cooperative audit, which is in the focus of this paper, is not in the spotlight of the literature. There is a lack of research on the practical relevance of cooperative audit, and of its relationship with the performance of cooperatives. However, cooperative audit is often considered in the highlight of the implementation of cooperative legislation. There are also several studies that pay certain attention to this topic. Main source of information presented in this paper were cooperative laws of different European countries and studies on their implementation in practice. When considering cooperative audit in Serbia, in addition to the current law on cooperatives, by-laws regulating this area were used, as well as papers written by local authors.

The basic methods used in the paper are: (1) the historical method, which was used to analyze the evolution of the application of cooperative audit in different socio-economic conditions; (2) the comparative method, which was used to identify similarities and differences in the application of cooperative audit in the European countries covered by the survey; and (3) the method of analysis and synthesis, which summarizes the results of the conducted research.

Results and discussion

Cooperative audit is more that pure financial audit, but they often go hand in hand. This is understandable, since cooperative audit often starts with the overview of financial documents. In some countries, the financial audit is the only form of control that cooperatives have to perform, and it usually contributes to a well-established system of control of cooperative work. In other countries, the cooperative audit is voluntarily and internal, which means that it is performed by a member of cooperative management, and the findings of such audit have advisory nature. However, many European countries practice external cooperative audit.

International examples of cooperative legislation demonstrate different approaches on how the cooperative audit is regulated and carried out. The experiences of European countries related to cooperative audit can provide valuable insights and help countries with less developed cooperative sector to draw on lessons and explore best practices. Examples of countries where the cooperative audit is extensively regulated and institutionalised include Austria, France and Italy, but experiences of other countries, such as Poland and particularly Slovenia, can also be relevant for the case of Serbia.

Cooperative audit in Austria

The cooperative sector in Austria has a long tradition. Cooperative audit is compulsory and it was implemented from the early stages of the development of cooperative sector. Beside general Cooperative Law from 1873, last amended in 2006, there is special Law on Cooperative Audit from 1903, last amended in 2009.

One of the specifics of cooperative audit in Austria is that it is included in all the stages of cooperative life, stating from the registration procedure of cooperative as a form of *initial audit*. This means that every cooperative has to undergo a specific preliminary review exercised by an Auditing Association/Union (*Revisionsverbände*), from the moment of its establishment. The aim of this process is to confirm that a cooperative can permanently fulfil its mission in promoting its members.

After the preliminary review upon registration, cooperative audit is performed at least once every two financial years. The goal of these processes is to ascertain the compliance with cooperative legislation and statutes, appropriate activity and facilities, good accounting and management practices, and promotion of the interests of members in line with the cooperative's mission, statutes and agreements (Cracogna et al., 2013).

All cooperatives must be a member of an Audit Association. This organisation appoints an auditor that performs auditing process in all the cooperatives that are its members. The compulsory membership in Auditing Association has certain advantages and disadvantages. The advantage is that cooperative audit serves as a certificate to cooperative's members and its business partners that cooperative is doing well. On the other hand, other types of organizations or legal forms can choose an external auditor, while cooperatives are in unequal position (Kühl, 2012).

Only registered and licensed Associations and persons can act as auditors. The right to perform an audit is provided by the competent federal state authorities, usually the Ministry of Economic Affairs. All Audit Associations are member of The Association of Austrian Audit Associations (*Vereinigung österreichischer Revisionsverbände***)** which is the roof organisation. Its task is to licence the auditors, which must pass an oral and written exam in order to gain a licence. This organisation also publishes the lists of licensed auditors, and regulates the professional principles that auditors should abide by in serving the public interest.

The auditor appointed to carry out the cooperative audit has the right to examine the books and documents of the cooperative. After the audit, the auditor prepares a written report with comments on the financial situation and the cooperative's perspectives for development. According to the assumption of cooperative audit, the report also highlights the compliance with relevant legislation and the cooperative agreement, the promotion of the interests of members, performance and economic viability of the cooperative and the connections to other cooperatives.

If the auditor finds any irregularities in the work of cooperative, he/she reports to the Board of Directors and the Supervisory Board and they convene the General Assembly. There are no stated obligations, but the report contains strong recommendations on the improvement of the cooperative's work (Kühl, 2012). In the given timeframe, the cooperative initiate corrective measures. If not, the auditor can refer to the Audit Association/Union. If the irregularities are still present, the audit report can be submitted to the commercial register and referred to a court.

Cooperative Audit in France

The cooperative sector in France is one of the oldest in the world. Cooperatives are regulated by the general Law on cooperatives (1947), which is accompanied by legal documents for other types of cooperatives, such as so called Code Rural (1972) for agricultural cooperatives.

Cooperative audit has existed from the early days. From 1935, the cooperative audit has been carried out by a specially formed auditing union (Parker, Cowan, 1944). Today, cooperatives are submitted to the regular annual financial audit, like other types of organisation. In addition to that, cooperatives are obligated to perform cooperative audit, known as revision (*fr. révision cooperative*), once in five years. Cooperative audit covers the legal, management and governance aspects and serves to verify whether the organisation and function are in accordance to the principles and rules of a co-op, and in the interest of its members (COGECA, 2015). This is particularly important for agricultural cooperatives, since they are subject to strong verification mechanisms.

Like in Austria, cooperative audit is involved in co-op life from the beginning. The registration of cooperatives can be repealed on the basis of legal verification and check for consistency with compulsory principles.

Audit is performed by cooperative auditors. All auditors must have a licence, which is granted for a period of 5 years and cover one or several categories of cooperatives. License is provided by the Minister of Social Solidarity Economy, following consultation with the High Council for Cooperation (HCC). The HCC is an organisation that defines the principles and standards for cooperative revision, advises on matters concerning cooperation, such as draft legislation, and proposes measures to promote cooperatives' development. After the audit, auditor prepares a written report that should emphasis the accordance of statute with legal requirements and the adequacy of management practices. The report should be submitted to the management of the cooperative and cooperative members, and finally presented and discussed at the General Assembly.

If the auditor finds any irregularities, he/she gives a deadline in which they should be corrected. If not, the matter will be forward to relevant Cooperative Union for a solution or even to a court ruling. If the irregularities persist, the final consequence of cooperative audit may even be the dissolution of the cooperative.

Cooperative Audit in Italy

Italian cooperative legislation is fragmentary and complex with provisions in several legal texts. All cooperatives should comply with the general rules of the Civil Code from 1942, last amended in 2003. The public control of cooperatives, known as revision (*it. la revisione cooperativa*), is regulated in the Legislative Decree of 2 August 2002. Besides the regular cooperative audit, cooperatives in Italy are subject to public control called "cooperative vigilance".[4]

The cooperative sector in Italy is developed and abounds in various types of cooperatives. There is a special emphasis on the social function of cooperatives, known as 'mutual purpose'. Cooperatives are considered to be mutual if they transact prevalently with their members. Other special laws stipulate that tax supportive measures apply only to mutual cooperatives (Bono, 2012).

Cooperatives in Italy are subject to both internal and external cooperative audit. Internal audit is performed by person from the management of cooperative (Cracogna et al., 2013).

External cooperative audit is more formal form of control usually carried out every two years and it refers to "mutual nature" of the cooperative. The audit should demonstrate that co-op is organised and functioning in line with the legislation and the rules of procedure adopted by the cooperative. It takes into consideration the effectiveness of membership, member participation in cooperative management, mutual relations and distribution of profit, tests eligibility of cooperative for tax and other benefits. Beside regular cooperative audit, extraordinary control may be carried out at any time, and it is initiated by the Ministry of Economic Development.

The cooperatives in Italy have strong incentives to federate. The cooperative audit is performed by the cooperative associations or federations towards their members (and to the cooperatives that have paid biannual contribution to this organisation) and by the Ministry of Economic for those cooperatives that are not members of any association.

The findings of the audit are documented in a report. If the auditor finds any irregularities, the cooperatives should correct them. The Ministry can take different measures if corrections weren't executed. These measures range from the substitution of the members of the cooperative organs with a director designated by the Ministry, to the most radical, dissolution of the cooperative (Cracogna et al., 2013).

4 http://www.parlamento.it/parlam/leggi/deleghe/02220dl.htm
The case study is mostly based on an overview of the relevant legislation.

Cooperative Audit in Poland

The Polish cooperative movement also has a long tradition. Cooperatives are regulated by general Cooperative Law Act (1982)[5]. Although this law was amended many times in the transition period, cooperative sector did not reach its full potential.

The cooperatives in Poland practise internal and external cooperative audit. Internal audit is performed by cooperatives' internal Supervisory Council which is composed of at least three members elected by the General Assembly. The responsibilities of this body related to cooperative audit include examining periodic reports and financial statements, carrying out periodic assessments of cooperative performance, with emphasis on members' rights, and carrying out control functions.

External cooperative audit ('lustracja' in Polish) is compulsory and conducted every three years. Besides controlling role, external audit also has a support and advisory function for cooperatives. The aim of audit is to: 1) verify compliance with the law and statute; 2) examine whether activities support the interests of members; 3) confirm effectiveness of the pursuit of economic, social and cultural principles; 4) notify cooperative members of any irregularities in its management; and 5) provide guidance to help address identified irregularities, improve functioning and support cooperative development.

External cooperative audit can be performed by cooperative union or association, or by The National Cooperatives Council (NCC). Cooperative Associations were present in the Polish cooperative movement since the foundation of the first cooperatives and carried out both business and non-economic functions (Parker, Cowan, 1944). Cooperative unions and association operate at country level and in all sectors and carry out cooperative audit, but membership is not obligatory. According to the Law on cooperatives (1961) co-ops had to be members of Auditing Cooperative Union, but this obligation was cancelled in 1985. Since the membership in Auditing Cooperative Unions is voluntarily, this results in a large number of unions that can carry out the cooperative audit (Matczak, 2012).

The National Cooperatives Council (NCC) manages the auditing rights of cooperative associations and issues licenses to auditors. Besides that, NCC also: a) represents cooperatives towards the government and in front of state authorities; b) act effectively in the legislative process; c) organizes research, training and information activities; d) keeps a register of cooperative audits; e) organizes arbitration procedures in the case of disputes between cooperatives, and if that is not successful requests that conflicts are resolved through court; and f) perform the audit of unions and associations of cooperatives.

The auditor prepares a report after the audit and submits it to the cooperative's Supervisory Council and Management Board. The findings of the audit are discussed at the next General Assembly meeting. The report serves as an official document and contains recommendations related to the improvement of cooperative business.

5 http://isap.sejm.gov.pl/DetailsServlet?id=WDU19820300210
The case study is partially based on an overview of this legislation.

Cooperative Audit in Slovenia

After the independence, the Law on Cooperatives was adopted in Slovenia in 1992. This law introduced the compulsory cooperative audit for all cooperatives.

The Law on Cooperatives were amended in 2007, including the chapter on cooperative audit, with detailed provisions on the content and scope of the audit. The legislation anticipated that the Cooperative Union should audit all its members and that all cooperatives with indivisible assets must become members of this Union within a specified period of time (Avsec, Modic, 2008).

However, these changes in cooperative law were interpreted in specific manner. The Slovenian authorities took a view that a cooperative union cannot be considered independent from the cooperatives that are its members, and therefore does not meet the criteria for conducting cooperative audit. In 2009 a change of cooperative law was adopted, which deleted the provisions on cooperative audit and eliminated the compulsory union membership for cooperatives with indivisible assets, making membership for all cooperatives voluntary (Avsec, Žerjav, 2010).

In the following years there were initiatives for the reintroduction of the cooperative audit, including a draft law in 2010, but the cooperative audit has not been re-established in Slovenia.

Cooperative Audit in Serbia

The cooperative sector in Serbia has a long tradition and has developed in parallel with the European and world cooperatives. Just two years after the establishment of the Rochdale cooperative in the UK, in 1846, first agricultural credit cooperative "Gazdovský Spolok" in Bački Petrovac was established. On the territory of Serbia from that period (without Vojvodina) first cooperatives were established in 1894.

Along with the development of the cooperative sector, considerable attention was paid to cooperative auditing. In the early cooperatives, a specific form of internal audit was practiced through the so-called "court of good people", although its activity was mainly aimed at resolving possible disputes and prescribing the character features of the cooperative members. However, the importance of cooperative audit was recognized in the first law regulating the work of cooperatives in Serbia – Law on agricultural and handicraft cooperatives (1898). This law regulated the establishment and operation of cooperative associations, in which membership was compulsory and who performed the tasks of cooperative audit. Cooperative audit was also included in the following Law on economic cooperatives from 1937.

Until the World War II, cooperative movement went through different phases, but most of the consequences for the contemporary situation in the cooperative sector were the developmental forms of cooperatives after 1945. Establishment of Peasant Producer Cooperatives, which practiced obligatory membership and investment of land, cattle and other agricultural inputs, and later of General Agricultural Cooperatives where business practice was not in line with the cooperative principles widely recognised

today, contributed to the negative connotation and lose of confidence in cooperatives. Existence of socially-owned property in cooperatives has roots from the period after economic reforms in 1965, and particularly from 1970's when agricultural cooperatives where merged with agricultural companies.

In the transition period, the cooperative audit was re-established in the Law on Cooperatives, adopted in 1996, but its implementation was limited, which had some undesirable consequences. For example, in this period there were number of organisation that used the name "cooperative" although did not have much in common with true co-ops. These organisations also apply a lot of damage to the idea of cooperatives. The irregular implementation of the cooperative audit, as well as its limited effects, enabled such behaviour (Nikolić, Arsenijević, 2015).

Currently cooperative sector is regulated by The Law on Cooperatives, adopted at the end of 2015. According to this law (Article 80), the "*cooperative audit is control of the harmonization of business, management and organization of the cooperative with the provisions of this Act, cooperative principles and cooperative values*".

There is distinction between cooperative audit and the audit of financial statements, according to the Law on Cooperatives (2015). In Article 57 is stated that a cooperative must keep business books, and draw up and submit financial statements in a manner and under conditions prescribed by the law governing accounting. The audit of the cooperative's financial statements is performed in accordance with the law governing the audit.[6]

The cooperative audit in Serbia is compulsory for all cooperatives and may be regular and extraordinary. Regular cooperative audit is conducted every two years at the request of the cooperative. An extraordinary cooperative audit is carried out if necessary at the request of: any governance body of the cooperative, at least 50 members of the cooperative, at least 30 percent of its members if the cooperative rules do not set a higher number of cooperative members, the cooperative union of which the cooperative is a member, the competent ministries, and creditors of the cooperative (Article 82, paragraph 3).

Law on cooperatives (2015), like the previous law from 1996, only superficially covers the area of cooperative audit, following the idea that more precise guidelines will be given in bylaws, created and adopted by auditing unions. Since several unions can be licensed to perform cooperative audit, this imply that bylaws can differentiate among themselves. In practice, this was the case during 1990s, when there were several Regulations, adopted by the Cooperative Union of Yugoslavia and the Union of Youth and Student Cooperatives of Yugoslavia.[7] Despite some similarities, these regulations had some substantially

6 Law on Accounting ("Off. Gazette of RS", no. 62/2013) and Law on Audit ("Off. Gazette of RS", no. 62/2013).

7 For example, Cooperative Unions during the 1990s individually wrote and adopted at least two partially different regulations: (1) The Rules on Cooperative Audit of Cooperative Union of Yugoslavia ("Sl. list SRJ" no. 26/98 and 28/98 - corr. and "Sl. list SCG" no. 1/2003 - Constitutional Charter), and (2) The Rules on Cooperative Audit of Union of Youth and Student Cooperatives of Yugoslavia ("Sl. list SRJ" no. 21 of 24 April 1998; 65/99 and 7/2000)

differences. Finally, this resulted in a situation where the process of cooperative audit is performed differently depending on the membership in cooperative unions.

All these inconsistency contributed to the fact that in the past the cooperative audit was carried out inadequately in Serbia.

Recommendations for improving Serbia's experience based on international examples

The examples of good practices and the experiences of other countries offer insights that might help in creation of a suitable model of cooperative audit for Serbia. A precondition for the successful implementation of cooperative audit is that audit unions lead the process efficiently and uniformly.

One of the first obstacles in this process is the unwillingness of cooperatives to became members and fully participate in the work of unions. The Polish experience indicates that one of the possible solutions is to establish some other form of organization that would perform cooperative audit in those cooperatives that are not member of any union. If insisted that only unions have the power to perform cooperative audit, an obligatory membership in auditing unions can be prescribed, as in Austria.

Another important factor is that the cooperative audit is subject to the same rules and procedures for the entire territory of the Republic of Serbia, as is done in many other European countries. In order to help the process of harmonization, the Ministry produced a model/template of the Rulebook and published it on its website. However, this document was just a guideline and had no compulsory nature, so it was left to every Audit Union if it chooses to amend and adjust it in accordance with their individual needs. Currently (end of 2017), there are four unions that are authorized to perform cooperative audits in Serbia: Cooperative Union of Serbia, Cooperative Union of Vojvodina, Cooperative Union of Belgrade, and Student and Youth Cooperative Union of Serbia. In practice, all four authorized Audit Unions adopted the Rulebook model unchanged, yet this does not guarantee its uniform implementation.

Having in mind previously elaborated experiences of chosen EU countries, the list of recommendation for improving the process of cooperatives audit in Serbia has been created. These activities may contribute to the modernization of the process of cooperative audit, which would consequently have positive effect on cooperative sector in total.

First, legislative framework needs to be supplemented with a procedure for issuing a certificate or license for cooperative auditors and to adopt criteria for acquiring the certificate, additional to those listed in the Law.

Second, in order to gain the license, auditors should take an auditors' exam after attending a specific education programme for auditors. Even after issuing the license, auditors would be under the obligation to attend additional courses in order to raise the competence, qualifications and quality of their work and to reapply for the license.

Third, it is also practice to publish a Register of Cooperative Auditors in the country. It would be advised that such register is published by the competent Ministry or Serbia's Ministry of Economy. All auditing unions can also publish separate registers of auditors for their members, but the Ministry can consolidate these information in a national Register of Cooperative Auditors, uniform for the whole territory of Serbia.

Fourth, according to the experience of France, Italy, Poland and other countries, it is also recommended to predict a withdrawal of the auditors' license of certificate in the case of misconduct. This would improve the accountability in the work of cooperative auditors and contribute that cooperative audit is performed in accordance with its principles.

In the end it is necessary to underline one more time the importance of adopting the same procedures and rules for the entire territory of the Republic of Serbia.

Conclusions

Further development of the cooperative audit system can be achieved through efforts to start introducing uniformity and standardization of the criteria for acquiring the cooperative auditor's certificate, as well as for the procedure and method of performing cooperative audit. For now, this cannot be achieved in a legally binding way on the level of the country because the Law doesn't foresee adoption of the bylaws on the national level, but initial steps can be taken so that every Audit Union applies the same criteria when hiring its own auditors or performing cooperative audit.

Also, the possibility of Audit Union's voluntary cooperation with other licensed Audit Unions in the Republic of Serbia on the standardisation of cooperative audit should be noted and encouraged.

Only through the continuous further development the cooperative audit system in Serbia will be able to fulfil goals proclaimed by the Serbia's Law on Cooperatives, i.e. support the practical use of cooperative audit reports, controlling and improving the work of cooperatives, and the potential future realization of the rights to subsidies, tax relief and other benefits envisaged by the Law.

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Conflict of interests

The authors declare no conflict of interest.

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LIMITATIONS AND OPPORTUNITIES FOR FUNDING AGRICULTURE AND RURAL DEVELOPMENT IN THE REPUBLIC OF SERBIA

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ABSTRACT

Funding is one of the most important issues of agriculture and rural development of the Republic of Serbia, because insufficient financial resources allocated to this sector of the country's economy are considered the key limitation for better valorization of agricultural resources and the revitalization of rural areas. Agribusiness and rural development have a major socio-economic importance for the Republic of Serbia, which is supported by a number of strategic documents, development indicators and scientific and expert analysis implemented in the country and at a global level; therefore, the aim of this study is to determine whether it is necessary and possible to improve the funding of agricultural development and rural economy of the Republic of Serbia, in current conditions. The survey results indicate potential sources, i.e., the possible ways of funding agriculture and non-agricultural activities in the rural areas of the Republic of Serbia.

Introduction

Topics including production of safe foods in sufficient quantities and at reasonable prices, conservation and rational use of natural resources, economic and financial issues, as well as other questions related to the development of agricultural and rural economy, have been studied by numerous authors, institutions and organizations worldwide.

Agriculture is of great socio-economic importance for the Republic of Serbia, especially because of its share in GDP, exports and employment. The important characteristics

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of agriculture and rural areas relates to the available natural resources, which are not properly utilized, due to a series of internal and external constraints in terms of their better valuation. Insufficient funding and lack of institutional support are among the most important factors that hinder the development of both agriculture and rural economy. Although great efforts have been made by the state and other relevant stakeholders, funding is still insufficient, regardless of the fact that the resource potential of rural areas is very highly estimated, as well as the natural conditions, country's long-lasting agricultural production tradition and the demand for agri-food products on the world market. Namely, very modest financial means that are invested in this sector of the economy have a very unfavorable effect on the situation in this sector and its prospects for further development.

The subject of this paper is funding of agriculture and rural development in the Republic of Serbia, while the aim of the research is to determine whether it is necessary and possible to improve the funding of the agriculture and rural economy development in Serbia.

The initial hypothesis is that if a larger number of quality funding sources for agriculture and rural development of the Republic of Serbia are provided, together with the adequate institutional support and in accordance with the specific characteristics of the domestic economic environment and complex international circumstances, it is possible to expect more successful business activities in this sector of the economy.

In terms of the research methodology, the following methods were used: descriptive research method, comparative analysis method, method of analysis and synthesis and SWOT analysis. In this respect, previous studies, relevant statistical publications and policy documents, and especially the legislation relating to the agricultural sector, rural development and funding, are of a paramount importance.

Literature review

Considering the global importance of agriculture and rural development, numerous studies have been carried out in order to research these scientific fields. Moseley (2003) points to the basic principles of rural development and role of agriculture in rural economy, as well as the practical importance of their development, while Rząsa & Ogryzek (2017) analyze the social aspects of rural development. Many authors use contemporary methodology in order to research the key issues of agriculture and rural development, thus giving different projections (Fagang, 2017; etc.) and pointing to the importance of the application of modern information and communication technologies in the field of agriculture and rural economy development (Hodge et al., 2017). Galinska (2013) examines agricultural policy of the EU (European Union) from the perspective of WTO (World Trade Organization), Volk et al. (2014) analyze agricultural policy and European integration in South East Europe, while Vujičić et al. (2012) study the European integration and rural development policy in the Western Balkans. Bogdanov (2015) looks at the most important issues of rural development and rural policy of the Republic of Serbia in modern conditions.

Funding is of a paramount importance, since it has a central role in many areas of the economy and society, particularly in agriculture, i.e. rural economy, where it plays a crucial role in development by determining directions and the degree of development (Radović et al., 2018; Njegomir et al., 2017; Jakšić & Grbić, 2013; Todorović & Vuksanović, 2012; etc.). The importance of funding the agriculture and rural development is supported by the example of the EU, where huge amounts of money are allocated to these sectors. In this respect, a very complex policy is implemented (Common Agricultural Policy - CAP), while the EU member states can also use the funding provided by the European Agricultural Guarantee Fund (EAGF) and the European Agricultural Fund for Rural Development (EAFRD).

Key characteristics of agriculture and rural areas of the Republic of Serbia, relevant from the funding perspective

In addition to very favorable natural conditions for agricultural development in the Republic of Serbia, agriculture is also considered of strategic importance for the country; however, this sector is underdeveloped, mainly due to the lack of funding, obsolete techniques and technologies, insufficient institutional support, low labor productivity, exports of the primary products or less-sophisticated intermediate products, small properties, poor organization of producers into cooperatives, poor cooperation with the processing industry and etc.

According to the Census of Agriculture 2012, there are 631,552 agricultural holdings in the Republic of Serbia, while the agricultural land covers the total area of 3,861,477 ha. The structure of agricultural holdings is a very complex one. It consists of non-commercial and commercial holdings. Family holdings (total no. of holdings: 628,552) utilize 82% of agricultural land, while agricultural enterprises (total no. of holdings: 3000) utilize 18% of agricultural land. In terms of the ownership structure of the agricultural enterprises, 2,521 holdings are owned by legal entities and 479 by entrepreneurs. The average utilized agricultural area per family holding is 4.5 ha, while the average size of the utilized agricultural area in terms of holdings owned by legal entities is 210 ha. Small farms (up to 2 ha) have the largest share in the total number of agricultural holdings (about 48%). Farms which have less than 5 ha, constitute as much as 77% agricultural holdings, while the largest farms, whose size exceed 50 ha, make less than 1% of agricultural holdings. The largest number of small farms uses extensive agriculture. The number of registered farms is continuously increasing. A total number of tractors used by the agricultural holdings is 597,816, of which 95% of tractors have been used for more than 10 years. According to data for 2012, mineral fertilizers were used by about 78% of holdings and applied on 2,298,574 ha of land. Plant protection products were used by about 72% of holdings and applied on the total area of 2,107,311 ha (MAFWE, 2017).

Based on the data for 2016, in terms of the total agricultural land utilized, arable land and vegetable gardens have a share of 75.5%, orchards 4.8%, vineyards 0.6%, meadows 10.0% and pastures 9.0%. In terms of the structure of the arable land, crops are grown

on 67.9% of land (mostly maize and wheat), industrial crops on 15.7%, vegetables on 2.6%, and forage crops on 9.1% of arable land. Among different kinds of fruit grown in Serbia, plums take the largest share. Considering the total value of agricultural production, plant production takes a share of 66.6% and livestock production 33.4%. It should be noted that 77% of holdings are involved in livestock production, however, the majority of farms generally raise a small number of animals (SYRS, 2017). Despite the fact that the animal husbandry sector is insufficiently developed, there are possibilities and opportunities for its development due to the favorable conditions for the production of animal feed and etc.

Rural areas of the Republic of Serbia, in accordance with the OECD definition, occupy about 75% of the territory and about 50% of the inhabitants live in these areas. The average population density in rural areas is much lower than in urban ones. The economic structure of rural areas is largely non-diversified, highly dependent on the exploitation of natural resources and the primary sector, mainly agriculture. Based on the data published in the Census of Agriculture, 12% of agricultural holdings are involved in other profitable activities, most of which include dairy products, while the importance of the tertiary sector is generally small. The major part of the rural labor force (about 45%) works in agriculture. Additionally, rural labor is employed, though in considerably smaller number, in the manufacturing industry (around 16%), trade (about 10%), construction (about 6%), transport (4%) and etc. However, the average net wages earned in the agricultural sector are significantly lower than in other abovementioned sectors (MAFWE, 2017).

One of the most significant demographic characteristics of the rural areas of the Republic of Serbia is the unfavorable age structure of the population. One in every five people who live in rural areas is aged 65 years or older. The average age of the owners of family farms is 59 years of age. Educational characteristics of the rural population are less favorable compared to urban areas (MAFWE, 2017). The share of specific categories of engaged workforce on farms in the total number of annual work units in agriculture (Census of Agriculture, 2012) is as follows: 44% of owners of agricultural holdings, 47% of family members and relatives, 4% of permanent employees on farms and 5% of seasonal workers and part-time workers.

Agricultural holdings have poor access to basic infrastructure, i.e., underdeveloped road infrastructure and telecommunications networks, lack of heating and sewage systems, inadequate water and electricity supply, lower quality of housing, insufficient availability of public services in rural areas, especially, public administration, education, health and social services. A particular problem is the limited access to funding, followed by rural poverty issues, social exclusion and etc. Regardless the mentioned issues, agriculture and the rural economy are still seen as the development opportunities of the Republic of Serbia (Table 1).

Table 1. SWOT analysis of the key characteristics of agriculture and rural areas of the Republic of Serbia, relevant from the funding perspective

Strengths	Weaknesses
• favorable climate conditions for agriculture • terrain • biodiversity • fertility, physical, chemical and biological properties of agricultural soil • long agricultural tradition • rich cultural and historical heritage of rural areas • defined policies and strategies of agriculture and rural areas development • local initiatives for agricultural and rural development • examples of good practice • energy potential of biomass for renewable energy production • natural resources for organic farming and rural tourism	• small non-commercial agricultural households • low level of specialization • outdated machinery, equipment and agricultural facilities • reluctance to implement modern management and marketing practices in agricultural holdings • unfavorable demographic trends and social structure • underdeveloped rural infrastructure • lack of comprehensive advisory services and continuous training programmes • limited skills and experience in terms of the preparation of projects and their implementation • insufficient budget funds • complicated access to loans • problems related to self-financing in agricultural sector • farmers' lack of confidence towards different types of funding • weak ties between science and practice • unsustainable natural resources management
Opportunities	**Threats**
• larger budgetary support • EU IPARD II Programme • use of international financial assistance • LEADER approach to rural development • establishment of the Farm Accountancy Data Network – FADN • training programmes in the field of finance • establishment of a specialized agricultural bank • favorable bank loans • securities-based funding • agricultural insurance schemes • exports of agricultural products • promotion of eco-development and energy efficiency	• high costs of improving agricultural production and rural economy • climate change • price volatility • migrations, especially of young people • migration of people, especially young people • rural poverty • insufficient cooperation at national and local levels • lack of quality financial instruments tailored to the needs of farmers and agribusinesses • economic and political constraints of internal and external character

Source: based on MAFWE, 2017

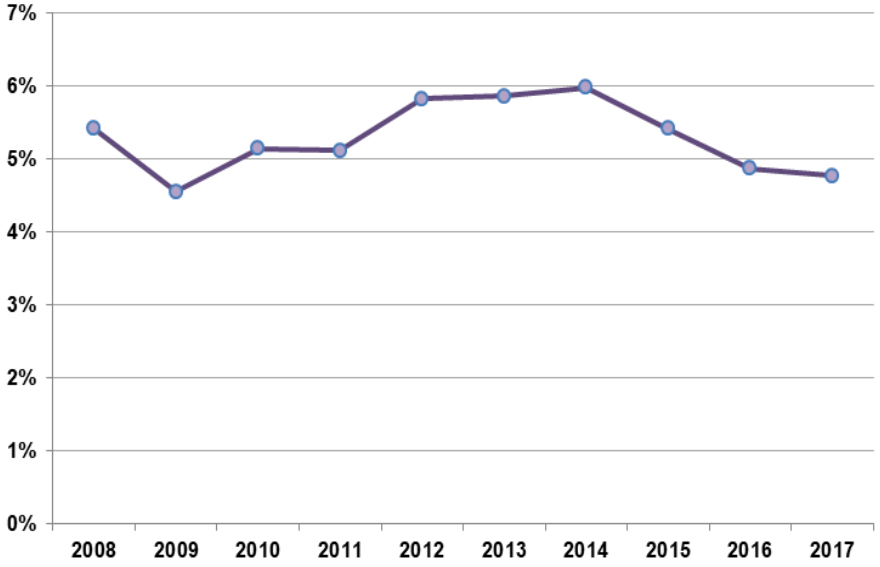
Available sources of financing agriculture and rural development in the Republic of Serbia

Although there are several options in terms of financing the agribusiness and rural development, the financial resources continue to represent one of the greatest limitations to the development of the agri-food sector and rural areas of the Republic of Serbia.

Agricultural budget, as part of the total budget of the Republic of Serbia, was established in 1996; however, the amount of funds that are allocated to this budget still depend on

the socio-economic conditions, rather than the real needs of agriculture and rural areas for financial support (SARD, 2014). In the period between 1996 and 2015, the average share of agricultural budget in the total state budget was about 4.8% (Radović, 2015). The share of budget allocations for agriculture in the total budget in the recent period is highly inconsistent (Figure 1).

Figure 1. The share of budget allocation to agriculture in total budget funds, in the period 2008 to 2017



Source: NPA, 2017

In the period between 2004 and 2012, the measures including the market-price support and direct support to producers accounted for 70% -90% of the total support allocated from the budget; structural and rural development measures constituted a significantly smaller portion of the budget, while the general support measures were least represented (only a few percent of the budget). After 2011, the financial support in the form of market-price support programmes was discontinued. The structure of funds used to subsidize inputs has changed dynamically, with the tendency to concentrate on the fuel and fertilizers price subsidies (SARD, 2014). In 2013, 94.4% of funds were spent for direct payments, 4% for rural development and 1.6% to support the activities of agricultural advisory services and food safety control (MAFWE, 2017). During 2016, the following forms of state financial aid were implemented: compensations, premiums, subsidies for planting the new perennial plantations and improvement of primary agricultural production, investment in agricultural product processing and marketing, conservation of plant and animal genetic resources, and etc. (MAEP, 2017).

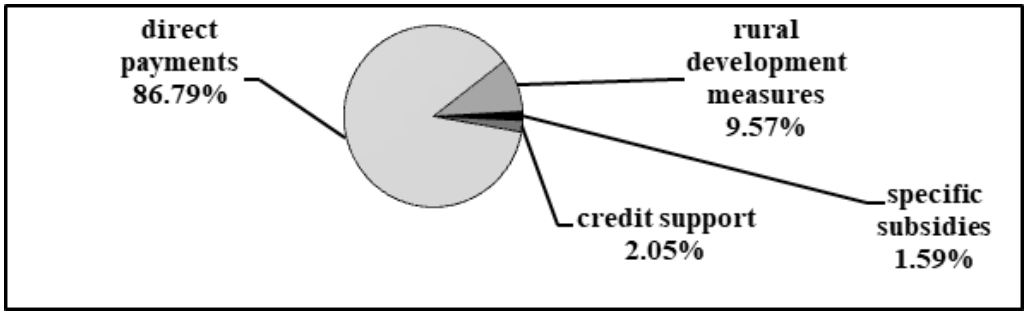
Table 2. Types of subsidies for agriculture and rural development of the Republic of Serbia, 2017

Direct payments	• Milk price support • Main subsidies for crop production • Subsidies for livestock production • Fuel and/or fertilizers price subsidies, as well as subsidies for public warehouses costs
Rural development measures	• Subsidies for improving competitiveness • Subsidies for the conservation and improvement of the environment and natural resources • Subsidies for income diversification and improvement of the quality of life in rural areas • Subsidies for preparation and implementation of local rural development strategies • Subsidies for improving the knowledge creation and transfer systems
Specific subsidies	• Subsidies for implementation of breeding programs, in order to achieve objectives in livestock production • Subsidies for the marketing and information systems in agriculture • Subsidies for production of planting material, certification and clone selection
Credit support	• Interest rate subsidy(subsidizing a part of the interest rate)

Source: NPA, 2017

After many years of low spending on subsidies for rural development, a significant increase in the amount of funds allocated for these purposes was recorded in 2017 (Table 2). However, direct payments are still the most important item in terms of the financial support provided for agriculture and rural development (Figure 2).

Figure 2. The average share of individual types of subsidies in total subsidies provided for agriculture and rural development in the period 2013-2017



Source: NPA, 2017

Pursuant to the Regulation on the Allocation of Subsidies in Agriculture and Rural Development in 2018 ("Official Gazette of RS", No. 18/18), 17,038,248,000 RSD were earmarked for direct payments, 2.4 billion RSD for the implementation of the rural development measures, 460 million RSD for credit support, 249,130,534 RSD for specific subsidies and 1,434,260,000 RSD for IPARD incentives, of which 358,565,000 RSD are provided from the state budget and 1,075,695,000 RSD are provided from the relevant EU funds.

Within the Ministry of Agriculture, Forestry and Water Economy of the Republic of Serbia, the Division of Financial Management and the Directorate for Agrarian Payments have been established (Directorate for Agrarian Payments, 2018). At the national level, as well as at the local level (numerous local self-government units), the commitment to rural development and agriculture is evident; however, there is still the lack of budget funds allocated for these purposes.

In terms of the EU support, the following IPA projects aimed at strengthening institutional capacities and preparation for IPARD implementation (Instrument for Pre-Accession Assistance in Rural Development) were completed: IPA 2007 "Capacity building to implement Rural Development policies to EU standards"; IPA 2009 "Technical Assistance to the Directorate for Agrarian Payments"; IPA 2010 "Establishment of the Serbian Farm Accountancy Data Network (FADN)"; IPA 2010 "Equipment and courier service supply and capacity building of Serbian National Referent Laboratories Directorate in food chain"; and etc. The Rulebook on IPARD Programme Incentives and Farmer's Assets ("Official Gazette of RS", No. 84/17) stipulates in detail the general and specific conditions for gaining access to funding, as well as determines other important issues such as qualified expenses and the like. A thorough project preparation is vital for the successful implementation of IPARD. The procedure is very complex and strict monitoring of project activities is implemented. IPARD II programme is very demanding and requires submitting of extensive documentation. Public call for applying for funds provided under the IPARD II for the investments in physical assets on farms - the purchase of a new tractor, was announced in January 2018 (MAFWE, 2018). The Republic of Serbia took part in several CBC programmes, however, projects implemented in agriculture and rural areas are not among the most successful projects funded by the EU.

Farmers in Serbia rarely use bank loans (Table 3). According to them, main issues in terms of the agricultural loans granted by commercial banks, are as follows (Radović, 2014): high interest rates; EUR-indexed loans; unconformity of lending with seasonal nature of the agricultural production; strict requirements for securing loans; high costs of credit insurance; short grace period or no grace period at all; farmers, generally, do not trust banks and etc. On the other hand, due to the high dependence of agriculture on weather conditions, slow capital turnover, and a number of difficulties that borrowers face in their efforts to pay their loan installments on time, agricultural loans do not have a large share in total loans of commercial banks. However, in recent years, a somewhat greater interest for the agricultural loans has been noted.

Table 3. Agricultural holdings that used subsidies and bank loans, according to Census of Agriculture data

Total number of agricultural holdings	631552
No. of agricultural holdings that used subsidies	
-total	179775
-only the funds provided for rural developments	1392
-only the funds in form of subsidies	168914
-subsidized loans only	3259
-several types of subsidies	6210
No. of agricultural holdings that took bank loans	18103

Source: Census of Agriculture, 2012

Agricultural equity market is not sufficiently developed in Serbia, in addition, the farmers do not show much interest for this form of financing. Pursuant to the Law on Public Warehouses for Agricultural Products ("Official Gazette of RS", No. 41/09) the Indemnity Fund was formed, a system of public warehouses established and a warehouse receipt (the commodity security which guarantees safe delivery of products stored in the public storage) was introduced (Table 4). Warehouse receipts are considered as a collateral; therefore, commercial banks are allowed to issue loans based on this type of security. However, this form of funding in terms of agriculture and related activities, has not yet become popular.

Table 4. Advantages of the system of public warehouses

Agricultural producer	**Public warehouse**	**Commercial bank**
• Quality warehousing • Safe warehousing • Short-term loans • Subsidies	• Larger income • Greater volume of business activities • Extended business activities • Sustainability of business activities • Minimal risk due to Indemnity Fund guarantee • Subsidies	• New market niche • Minimal risk, due to warehouse receipts which are used as a collateral, a high level of liquidity of the deposited goods and the right of realization of receivables • Option to use EBRD credit lines

Source: Indemnity Fund, 2018

Active participation of individual farmers in commodity-stock trade was facilitated by the establishment of the "Agrar Produkt" ltd. in 2003, by the Commodity Exchange in Novi Sad. The main intention behind the establishment of the "Agrar Produkt", was to make this company a link between individual farmers and commodity-exchange market, i.e., the intention was to make this institution the representative of farmers in selling their products through the Commodity Exchange, and in this way practically becoming their broker (CENS, 2018). However, the stock exchange has not attracted the huge interest of local farmers.

Although the financial leasing market has not yet been sufficiently developed in the Republic of Serbia, its role in financing the agriculture and related activities (primarily related to the purchase of agricultural machinery and equipment) is becoming

increasingly important. The benefits of the financial leasing include: adjustment to the seasonal nature of production; simple and fast procedure of financial leasing contracts realization and the like. Disadvantages of the financial leasing are primarily related to its additional costs, such as the cost of insurance of the subject of leasing (leased asset) and etc. (Radović, 2014).

Agricultural insurance provides financial protection against loss of income, because agriculture is highly vulnerable to the impact of weather conditions. Regardless the fact that the paid insurance premiums are reimbursed by the state, the level of development of the agricultural insurance -measured by the share of insured arable land and farms, the number of insurance policies and the height of insurance premiums, is very low in the Republic of Serbia. This unfavorable situation can be explained by the low insurance culture, standard of living of the rural population and the like (Kočović et al., 2016).

Potential funding sources for agriculture and rural development of the Republic of Serbia

Persistent lack of funds needed to fund agricultural production and rural development is one of the major problems of the Serbian economy. With this in mind, there is a need to provide more significant financial resources that will be invested in this sector of the country's economy (Vasiljević et al., 2015). There are several available options in order to make this possible.

The public warehouse system, for example, up to 2013, was selves sustainable with 18 licensed public warehouses and estimate from the Indemnity fund is that total amount of loans against warehouses receipts up to the end of 2013 was 50.000.000 Euros, with interest rates 25% lower compared to regular loans. Accordingly, some recommendations for improvement are: changes of Law on the public warehouses (especially important requirements for all grain warehouses whose providing storing service for third parties to be mandatory licensed as a public warehouses); establishment of the inspection service for public warehouse within the Ministry of Agriculture, Forestry and Water Economy (in practice, it is very important part of the public warehouse system, but this service is not established so far); arrangements with Commodity directorate reserve to recognize public warehouse automatically as authorized Commodity directorate reserve's warehouses; to introduce public warehouse electronic registry, donated in 2009, because by FAO (Kovačević, et al., 2016), electronic database has huge effect on system reliability, interest rates and number of banks involved in the lending against warehouse receipts.

The system of pre-harvest financing is also very interesting. It has been introduced successfully for the first time in Brazil in 1994. The system of pre-harvest financing is introduced as a pilot project for Europe, and it was also introduced in Serbia and Ukraine, with great support of the European Bank for Reconstruction and Development (EBRD). The Law on financing and provision of financing agricultural production („Official Gazette of RS", No. 128/14), establishes a new system of financing agriculture in the

Republic of Serbia, which tend to provide agricultural manufacturers to ensure the favourable financial resources for their production in pre-harvest production process, under very favourable conditions. The Law has been enforced since 1st June 2015. Many believe in the success of this Law. Nevertheless, should not expect that the Law will generate revolutionary success overnight, but it offer a great alternative source of financing for agricultural production and thus promises improvements in the field of financing agriculture in the Republic of Serbia.

It is known that the establishment of modern commodity exchanges and the development of spot and futures markets contributes to building a market-oriented economy, especially the sector of agricultural products. Thereby, the Law on Commodity Market establishes the necessary legal and institutional framework for the development of futures trading, and provides the basis for the introduction of mechanisms to eliminate the biggest risks of doing business. The adoption of the Law on Commodity Market has multiple benefits for the public sector. It allows the organization of the system of support to agriculture through market intervention mechanisms and the expected effects include more efficient management of commodity reserves, as well as improving the agricultural and agribusiness development policy. In Serbia there is currently no adequate legal framework for the development of commodity exchanges, so precise regulation through a comprehensive law on commodity exchanges, as well as a clear definition of law enforcement measures, could contribute to reducing the current risk exposure for business, particularly small and medium-sized enterprises and farmers. In this way, the economy will be able to use derivatives as a risk management instruments, particularly in the field of agricultural products prices (MTTT, 2018).

A viable model of funding agriculture and rural development could be based on significant funding from the agricultural budget. The Strategy of Agriculture and Rural Development of the Republic of Serbia 2014-2024 (SARD), points out that the creation and implementation of a more efficient model of funding the agriculture and rural development is an imperative, since this represents a strategically important issue. Long-term stability of financial resources and equal and unrestricted access to all potential users to funding resources represent the essential prerequisites for the increase in investment activity in the agricultural sector. If there are no specific financial products and services that would provide insurance against production and market risks and motivate economic operators to realize new investments, it is not possible to make any plans relating to the agribusiness development. The establishment of an efficient system of support for agriculture, requires significant institutional adjustments in the direction of establishing and reforming relevant financial institutions and financial instruments. The task of the state is to adapt the legal framework, enable the creation of dialogue and promote innovative solutions in terms of the financial markets and, above all, to ensure efficient and stable budget support (SARD, 2014). The National Programme for Agriculture 2018-2020 (NPA) represents a detailed elaboration of the Strategy for Agriculture and Rural Development of the Republic of Serbia and offers viable solutions in the area of defining and implementing agricultural policy in

the period 2018-2020. The financial plan included in the NPA consists of the defined groups of measures. NPA, as an operational programme for the implementation of the agricultural policy defines the objectives of the agricultural policy, types of measures and the dynamics of their realization, including the planned funding resources, rules for implementation and indicators for measuring the achievement of objectives. Having in mind the structure of agricultural subsidies of the Common Agricultural Policy of the EU (CAP), other neighboring countries and global tendencies, as well as the structure of national envelope subsidies, it is obvious that the certain changes are necessary. Namely, the most budget funds for agriculture and rural development of the Republic of Serbia are allocated for direct payments. Hence, it is necessary, as soon as possible, more funds gradually reallocate to the other types of subsidies for agriculture and rural development, such as rural development measures, credit support and specific measures. The effects of such changes should be continuously monitored, in order to undertake a timely adjustments if they are needed.

The availability of IPARD funds should strengthen rural communities and agriculture. It is important that the funding provided by IPARD II programme should be focused at (MAFWE, 2017): competitiveness of the agri-food sector; alignment with the veterinary, phytosanitary, environmental and food safety standards of the EU; restructuring and modernization of the sector; development of sustainable resource management practices; strengthening of the LEADER approach and etc. The selection of measures to be included in IPARD II programme must be based on the sectoral analyzes, need assessment and development needs and potentials. Thereby, the experiences of the countries that are users of the IPARD funds are very useful for Serbia. Namely, the successful practice in some new EU member countries was to open paying agency system to banks and other lenders. This system is allowing banks to lower risk since the IPARD approval is lowering the credit risk and banks are able to check status of IPARD approval with paying agency, as well as to establish sort of collateral on IPARD approved project.

The establishment of a specialized agricultural bank is strongly recommended by some experts, while the main activity of this bank should imply the issuance of agricultural loans under favorable conditions, in accordance with the relevant economic principles.

As one of the solutions for addressing insufficient understanding of banks relating to the specificity and the very essence of agricultural activities can be overcome by introducing the grace period, number of different of benefits offered to loyal and regular customers, favorable credit lines, new collaterals etc. Furthermore, it is important to expand the range of risks covered by agricultural insurance lines, that is, to work together with the banks in order to design more favorable loans that would include agricultural production insurance, as a means of an additional security instrument, lower the cost of insurance premiums on a mutually acceptable level and the like (Radulović, 2013).

In order to develop agriculture, it is necessary to more significantly include securities as a means of funding within the concept of providing financial support for agriculture.

Implementation of futures contracts would enable agricultural operators to better plan their production, provide more secure product placement, protection against market risk, and etc. (Radović, 2015).

The establishment of the FADN system in the Republic of Serbia is of crucial importance, as the implementation of this system would provide a comprehensive overview of the organizational and economic characteristics of the Serbia's agriculture sector and facilitate development of the relevant databases and analytical reports that would be internationally comparable (MAFWE, 2018). Therefore, it would be much easier to establish an adequate funding model.

Conclusions

The imperatives including development of the rural infrastructure, technological modernization and increased efficiency in terms of agricultural and non-agricultural activities in rural areas of the Republic of Serbia, require much more funding compared to currently available funds. Although both the stakeholders and the interested public are informed about different types of the successful financing models, financial resources are still one of the greatest limitations of the development of the agri-food sector and the rural economy in the Republic of Serbia.

In order to revitalize agriculture and rural areas of the Republic of Serbia, it is necessary to implement more efficient funding modalities. In addition to budgetary support, greater use of EU pre-accession funds and other international funds, as well as the bank loans tailored to the needs of agricultural and rural economy, it is necessary to increase funding through securities and similar financial instruments. Effective funding of agricultural and rural development is possible only within the framework of the fundamental institutional improvements relevant to this area. The role of state is indispensable in this process; however, external support options should also be considered, however these must be in line with the national interests, and above all, the survival and further development of small agricultural holdings.

The main limitation of this research refers to the complexity of the financing issues. The hypothesis set in this paper is confirmed, since it can be concluded that if more quality sources of financing of agricultural and rural development of the Republic of Serbia are provided, together with the adequate institutional support, in accordance with the specific characteristics of the domestic economic environment and the changed international circumstances, it is possible to expect realization of more successful business activities in this sector.

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THE POSSIBILITY OF USING DATA MINING IN THE RESEARCH OF AGRICULTURAL HOLDINGS

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ABSTRACT

Purpose. The aim of this study was to examine the usefulness and accuracy of Data Mining techniques on the example of testing the presence of impact evaluation of the quality of the land on the level of income of agricultural holdings on the basis of test samples. Methodology. The study was analysis conducted on a random sample for identifying key factors in the research of impact evaluation of the quality of the land on the level of income of agricultural holdings, on a data set of 179 examples, where the input consists of various variables: factor of erosivity, the power of the land, reducing the pH value, presence of organic matter, then target discrete variables with two descriptive values: at a expected yield and real yield. Results and Conclusions. The results obtained from the experiments agree confirmed a physical and chemical factors properties largely determines the classification results.

Introduction

Land quality is usually defined as "the capacity of a specific type of land that functions within the natural or farmland boundaries of the ecosystem, to maintain the plant and plant animal productivity, preserves or increases the quality of water and air and supports

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health and standard of human beings "(Karlen et al., 1997). Inherent soil quality can be assessed based on the study land within the network of national monitoring. The dynamic quality of the land includes those land properties that can be change in a short period of time under the influence of usage measures and land management. Land quality (Trgovčević Prokić, Počuča, 2016) is initially presented as an approach that makes it better use of land for different land functions, thus putting the accent on the live and the dynamic nature of the land. The quality of the land is assessed in relation to its functions (Karlen et al. 1997). The ability of the soil to perform any of the many functions depends on its physical, biological and chemical properties.(Vukoje, 2013). The aim of this study was to examine the usefulness and accuracy of Data Mining techniques on the example of testing the presence of impact evaluation of the quality of the land on the level of income of agricultural holdings on the basis of test samples.

Application of Data Mining in the last decade has brought about a significant methodological shift in the field of scientific research in agricultural. The classical method which assumes normative-descriptive methods supported by classical multivariate statistical methods has become the basis for establishment of machine learning as productive and more accurate scientific methods in agricultural research (Mihajlović, 2014). Study Hira and Deshpande (2015) has been to investigate analysis approach helps to build model and apply advance techniques like multidimensional data analysis, statistical mining and data mining to extract knowledge for to analyze agriculture productivity using various agriculture related parameters. The methods employed were Unsupervised Linear Discriminant Analysis and Decision Trees (Bengio et al., 2004). The present study contributes to agricultural research by examining the suggested variables in order to identify those that can best discriminate cases variables which are dominant in validation in case at a expected yield and real yield.

Materials and methods

The research process is based on well-defined and grouped data, determining the variables (target variable) and applying selected methods with analysing and interpreting the results. In this paper we used the following research method Decision trees and rules, as well as teaching methods with a combined classifier and methods of accuracy estimation of learned classifiers: test set methods, cross-validation method (Kotsiantis, Zaharakis & Pintelas, 2007).

We used the following software tools in our research: - system for knowledge exploration – WEKA, a large number of implemented inductive learning algorithms, analysis of reducing the dimensionality of space attributes; Random Forests algorithm (Breiman, 2001; Pamučar, Ćirović, 2018); Tanagra and Sipina Data Mining software for academic and research purposes. It proposes several data mining methods from exploratory data analysis, statistical learning, machine learning and data base area (Xuab Z., Lee J., Parka D., Chunga Y., 2017).

Our research is related to the results of identifying key factors of the agricultural

research of a physical and chemical factors on 179 cases, where the key factors are: factor of erosivity from 0 to 31, where average the is 10.13 and the power of the land from 0 to 33, with average value is 11.12. The same principles are used in the case of reducing the pH value from 0 to 19 with the average value of 5.99 and presence of organic matter from 0 to 20 with the average of 6.65.

From the sample we identified 89 cases of expected yield, and 90 with real yield.

Our research is related to the results of identifying the key factors impacting whether at a expected yield or real yield. Data was grouped into five categories (variables), namely: X1 = fcsex (soil types): 1 = Black soil , 2 = Vertisol; X2 = faggr (factor of erosivity); X3 = maggr (the power of the land); X4 = fanxdepr (reducing the pH value); X5 = manxdepr (presence of organic matter), X6 = clin (yield): 1 = expected yield , 2 = real yield and it based on sample of 179 items.

Identifying the key variables of X1, X2, X3, X4, and X5, (excluding X6 as a target variable), can be identified as a typical classification problem, and takes place in two procedural stages. In the first phase, the model is trained to use the soil sample. The sample is organized in rows and columns. One of the attributes is the class attribute, which predominantly affects the key factor for defining real yield. In the second step, the model is trying to classify an object that does not belong in the soil sample.

The authors used supervised linear discriminant function with validation accuracy processing of the classification method, namely: cross-validation. The method of cross-validation randomly divided a set of examples D on k mutually exclusive subsets D1, D2,...,Dk of approximately the same size. The sampling process and assessment is repeated k times, each time using one subset of Di as a test set. The bootstrap method is a family of methods for the estimation of prediction accuracy. For a given set of examples, a bootstrap sample is formed randomly taking n examples uniformly from a set of examples, with a replacement (Kohavi, 1995). Other than LDA method, we used the Decision Trees (Breiman et al., 1984) in our research by algorithm C 3.4 with validation methods, namely Random Forests (Breiman, 2001). The main goal of these statistical methods is to determine the useful variables for the purpose of classification. The first step uses the method of supervised learning by linear discriminant function with continual variables, X1, X3, X4, X5, and X6, as the target - predictor discrete variable category: expected yield or real yield.

The results indicate that there is a substitution error of 0.18. The detailed results of the sampling process imply that several variables do not seem relevant in the classification model. Summary of the LDA model are designed FCSEX, MAGGR and FANXDEPR as significant. Since the first function is standardized, these coefficient can be used to make judgments about relative importance of each variable. Since FCSEX makes the largest contribution to the first discrimination function followed by MAGGR- the power of the land and FANXDEPR - reducing the pH value.

$$Z = 6.3X_1 + 0.07X_2 + 0.17X_3 + 0.06X_4 + 0.03X_5 - 6.34$$

But the question that remains is whether all variables or only some are relevant in the resulting model? To answer this question we used the selection feature, the process of selecting a subset of relevant features for use in the construction model. The main assumption when using a selection technique feature is that the data contains many redundant or irrelevant features. We realized that the re-substitution error rate is not accurate and requires the use resampling method (Bootstrap) for obtaining honest error estimate. We observe that true error rate is about 0.195.

The next step is applying a stepwise discriminant analysis (STEPDISC) (Rikalović, Soares, Ignjatić, 2018) approach in the process of sampling, with the purpose of finding how many variables are sufficient for the classification variables that determine membership in the expected yield or real yield?

We applied FORWARD strategy and set the comparison of the F statistics as a stopping rule. We saw that two variables are selected out of 5, and according to the analysis STEPDISK, the only relevant attributes (variables) are MAGGR - the power of the land and FANXDEPR - reducing the pH value.

The next step in analysis is establishing the control of efficiency. In this sense, analysis is performed through supervised LDA and bootstrap components. (Mc Farlanea et al., 2016) Classification performance measured by the rate of error is the same this time 0.179, but now with a new LD function of only one variable, which is of decisive importance for the determination of classification in the expected yield and real yield, is as follows:

$$Z = 0.15MAGGR + 0.14FAXDEPR - 1.4$$

with reduced bootstrap error of 0.189.

Results

In addition to discrimination analysis, a study was carried through the decision tree, through the C 4.5 algorithm, which is based on a tree structure, where each leaf node represents a test attribute, and each branch represents the results of the test. The goodness of a split is based on the selection of attributes that are better separated in the sample. Identifying target variable can be regarded as a typical classification problem. (Sabarina, Priya, 2015)Classification is a two-step procedure. In the first step, a model is trained by using a soil sample. The sample is organized in tuples (rows) and variables (columns). One of the attributes, the class label attribute, contains values indicating the predefined class to which each tuple belongs. This step is also known as supervised sampling. In the second step, the model attempts to classify objects which do not belong to the training sample and form the validation sample. In this study we employed the well-known ID3 algorithm. ID3 uses an entropy-based measure, known as information gain, in order to select the splitting attribute (Han & Kamber, (2000). The successive division of the sample may produce a large tree. Some of the tree's branches may reflect anomalies in the soil set, like false values or outliers. For that reason tree pruning is

required. Tree pruning involves the removal of splitting nodes in a way that does not significantly affect the model's accuracy rate. In order to classify a previously unseen object, the variable or attribute values of the object are tested against the splitting nodes of the Decision Tree.(Matei et al., 2017) According to this test, a path is traced that will conclude with the object's class prediction. Main advantages of Decision Trees are that they provide a meaningful way of representing acquired knowledge and make it easy to extract IF–THEN classification rules.

Supervised learning produced decision tree, with classifier performance: error rate 0.146 and decision tree, as follows:

- *MANXDEPR < 9.5000 then CLIN =* ***EXPECTED YIELD****(84.09 % of 88 examples)*
- *MANXDEPR >= 9.5000 then CLIN =* ***REAL-YIELD*** *(80.00 % of 5 examples)*

- *MAGGR >= 9.5000*
  - *FANXDEPR < 8.5000*
    - *MAGGR < 15.8250*
      - *FANXDEPR < 5.1900*
        - *MAGGR < 13.5000 then CLIN =* ***EXPECTED YIELD*** *(63.64 % of 11 examples)*
        - *MAGGR >= 13.5000 then CLIN =* ***REAL-YIELD*** *(66.67 % of 6 examples)*
      - *FANXDEPR >= 5.1900 then CLIN =* ***EXPECTED YIELD*** *(75.00 % of 8 examples)*
    - *MAGGR >= 15.8250 then CLIN =* ***EXPECTED YIELD*** *(88.00 % of 25 examples)*
  - *FANXDEPR >= 8.5000 then CLIN =* ***EXPECTED YIELD*** *(100.00 % of 35 examples)*

We use C 4.5 and cross-validation in order to evaluate the accuracy of a standard (individual) decision tree algorithm. The error rate is 0.247.

The next step is implementing the Random Forests algorithm. There are two steps in order to insert the Random Forest method as controlling methods in the diagram: First we applied BAGGING. Bagging shall generate multiple versions of the classifier used as a unified whole, through the mechanism of voting. More classifiers are generated by the soils set as an example is bootstrap-Travels. The sampling each set is an independent pattern of examples and some examples have been omitted, while some are repetitive. As with other methods of ensembles, the procedure is suitable for aggregation of

results of "unstable" algorithms, algorithms relationship in which small changes in the training of its rally caused major changes in the learned set of rules. Embed method and then Fandom Forests methods (Saeys, Inza & Larrañaga, 2007) and techniques as controlling method by resampling data and by selection subsets of attributes in process of resampling by induction trees (Touw, Bayjanov, Overmars, Backus, Boekhorst, Wels & Hijum, 2012). Finally we evaluate sampling accuracy with cross- validation components. Estimation of the accuracy of the classification using a method of cross-validation gets the error rate of 18%.

Discussions

Three alternative models were built, each based on a different method. First, the Decision Tree model was constructed using the Sipina Research Edition software (Kamilaris et. al.,2017). The model was built with confidence level 0.05. We used the whole sample as a soil set. The model was tested against the sampling and managed to correctly classify 81% expected yield and 82% real yield.

Interpreting the IF- THAN is as follows: IF MANXDEP - presence of organic matter IS GREATER OR EQUAL 2.5 TNEN 37% is expected yield and 63% is real yield AND IF MAGGR - the power of the land IS LESS 9.5 THEN 71% is expected yield and 29% is real yield AND IF FAGGR -factor of erosivity IS LESS 7.5 THEN 83% is expected yield and 17% is real yield.

We noticed that IF MAGGR - the power of the land IS GREATER OR EQUAL 9.5 THAN expected yield case is 16% and 84% is real yield, and in last case. IF FAGGR - factor of erosivity IS GREATER 7.5 THEN 40% is expected yield and 60% is real yield.

The use of the proposed methodological framework could be of assistance to agricultural holdings. In terms of performance, we apply the supervised discriminant analysis (SPV LDA) in order to identify specific variables that influence expected yield and real yield for both with the methods of classification accuracy of validation influence variables and identifying the key variables which are MAGGR, and FAXDEPR in some weight (0.15* MAGGR and 0.14*FAXDEPR) with accuracy at a level of 82%. Decision Tree method was used, which gave results that are more accurate in terms of determining the extent and logical connection between variables of impact of individual variables. Obtained logical connection between variables and its weight of impact and unlike traditional multivariate study (Hiironen J., Riekkinen K., 2016), this is where the research through classical statistical methods worked out three variables that influence the presence of impact on evaluation for factor of erosivity, the power of the land, reducing the pH value, presence of organic matter tree variables are not decisive for qualification. All the research into the foreground has been achieved and this is a great degree of accuracy studies. The present study contributes to agricultural research by examining the suggested variables in order to identify those that can best discriminate cases variables which are dominant in validation in case at a expected yield and real yield.

Conclusions

The application of Data Mining would significantly help researchers in the field of agricultural, particularly because of the possibility that the research work sparse datasets, which have a large number of attributes and a very small number of examples. In our example we recognized the problem of sparse data and sparse data set (data with small relations between number of observation and number of variables). Implicitly it prevents sufficient good differentiation of new examples. In agricultural it is necessary to achieve the same or greater accuracy of prediction, which is very subjective evaluation, that the development of agricultural changes.

The present study contributes to agricultural research by examining the suggested variables in order to identify those that can best discriminate cases variables which are dominant in validation in case expected yield and real yield properties.

However, it is possible to achieve the results of the minor increase of the number of variables and the extent of sample to the level of about 93% to 100% accuracy. Also we assigned a problem of scarcity associated with the assessment of the severity of quality of the land problems (task difficulty), which is solved in the domain of Data Mining by reducing the number of attributes (variables). Such approaches allow detection methodically of so far hidden knowledge in agricultural, and especially the causes that determine the decisive variables and attributes and factors for solving research problems in these and other research areas.

Conflict of interests

The authors declare no conflict of interest.

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THE EFFECT OF CRUDE OIL PRICES FLUCTUATIONS ON THE AGRICULTURAL PRODUCERS` PERFORMANCE EFFICIENCY

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ABSTRACT

Purpose. The development of agriculture and the security of food supply primarily on the domestic market represent the base of the economic development, and of economic and social stability of a country. Methodology. By using the VaR method, which is the best available risk-measuring technique, the crude oil price fluctuations will be followed in a designated period, in order to understand its influence on the creation of the business policy of agricultural producers. Results. A significant support for the development of agriculture is provided by the leading companies in the crude oil and oil derivatives industry. Conclusions. The aim of the current study is to comprehend the level of influence of crude oil prices as a global economic factor on the behavior of agricultural producers.

Introduction

Agriculture is a strategic area of the economy, and the entire social development is based on it. Having this in mind, the supportive measures for further development of the agricultural market must have a national frame, with participation of relevant producers who can contribute to the economic strengthening of the agribusiness production.

With the rise in prices of agricultural produce, as a dominating trend in the past several decades (Grunert, 2005; Bellemare, 2014), the economy and social costs increase as well. This process can have an effect on consumers´ health, education, family ties and the standard of living. If the prices of agricultural products (Du et al., 2011; Kilian, Murphy, 2014) are observed over a longer period of time, it is noticeable that the changes are non-linear, i.e. they are under the influence of global economic cycles and the demand for these products in countries with high population numbers (IMF, 2016). Particularly relevant research in the field of price fluctuation of agricultural goods

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and the creation of policy by the agricultural producers are related to raw materials used in production. Among multiple factors, the crude oil price fluctuation, as a global economic factor (Mensi et al., 2017; Ignjatijević, Čavlin, 2017), significantly affects the business policy of agricultural producers. Support for agribusiness is welcome in any form, especially in the period of intense field work. Preparation requires the use of adequate equipment. An important part of the budget are the costs of maintenance of agricultural machinery. This includes fuel costs. Rise in the crude oil prices leads to the rise in costs of basic production input, such as fertilizer, which in return leads to higher costs of production of agricultural products. This then leads to the change in business policy of agricultural producers.

In relations to this, creators of the agricultural policy, as well as traders of agricultural goods (Nazlioglu et al., 2013), may find use in methods for risk identification and management in the crude oil sector. The events in the global assets and financial market(Vučković et al., 2017) have forced the global regulatory institutions to begin developing minimal standards for risk management for financial and non financial institutions. Risk management is in essence focused on humans – their way of thinking, whereas information solutions are tools for risk management. Using the VaR method, as the most suitable one for risk measuring (The Basel Committee took it as such, as well), but also with the development of an internal method for market risk (Dinică, Bale, 2014) measuring based on the VaR method, it is possible to create a risk management image in trade. In other words, it is possible to find answers to the question if a company can create adequate earnings, is it efficiently utilizing available tools, can it fulfill its obligations on time etc.

Subjects interested in these answers may be creditors, investors, shareholders, other companies but also individuals who find themselves in the position of stakeholders.

Materials and methods

Risk is an essential element of human activities. Risk entails a situation in the future with multiple alternative solutions and a certain realization possibility. In other words, in the given situation there is unpredictability about the outcomes and the probability that the outcome is unfavorable (loss possibility). It cannot be eliminated, but it can be controlled and to a certain degree managed through risk management. Risk can also be defined as: a possibility of a loss, a probability of a loss, uncertainty, a discrepancy of real from expected results or a probability of any outcome other than the expected one. The common elements for the multiple definitions are uncertainty and loss.

According to (Barjaktarović, 2013; Barjaktarović, Jeremić, 2013), the methods for market risk assessment are divided into traditional ones and the modern ones. The traditional methods start from the premise that the value of instruments is equal to the current value of future monetary flows which comprise the instrument. The assumption is that the future equals the present, in other words – it is predictable. It is suitable for a smaller number of instruments in the portfolio. The modern methods include

sensitivity analysis, extreme events testing, scenario testing, CAPM and VaR methods. Their common traits are portfolio creation within market uncertainties. They take into account multiple parameters: yield, taken risk, diversification effect and mutual dependency of financial instruments in the portfolio.

Cvetinović (2008) says that an adequate approach is to start defining a risk management strategy, and then analyze which software solutions should be included in the risk management process. Software solutions can be used for different calculations, transactions measurements, interest rate calculation, volatility and correlation, inclusion of control modules for risk control in every application used by the business entity, not just in the risk management application.

Barjaktarović (2013) states that the development of the financial sector brings about many news in the field of risk management, and especially in the field of modelling of market, credit and operational risk. The main methodology for risk management is the Value-at-Risk (VaR) method, which is used in combination with other techniques for business risk minimizing, in order to achieve optimal business results.

It is believed that the Var method is currently the best available method for risk management. Three basic methods of VaR are: the analytical or parametric, the historical, and the Monte Carlo method. Each of them has its own merits and pitfalls, and the right one needs to be selected for any given problem.

The historic simulation belongs to the group of non-parametric VaR calculation methods. What all non-parametric methods have in common is that they use empirical divisions extracted from the observed data. On the other hand, the parametric approach entails assumptions about the theoretical yield divisions. In sum, in the parametric methods there is the assumption about the division of the portfolio´s yield, whereas in non-parametric methods, the division is established empirically. The basic assumption in this method is that the near future will be very similar to the recent past, and that based on the data from the recent past, the risks of the near future can be evaluated. There are several ways in which the VaR can be calculated using the method of historical simulation. Some of the methods of the historical simulations are, for instance, the standard model of historical simulation, the simulation model weight by time (BRW model), the Hull-White model of historical simulation (where the GARCH and EWMA methods are used to test volatility) etc. Weighed models have been developed in the recent years with the standard methodology and they greatly improve the standard approach and remove the majority of flaws from the historic simulation (Dowd, 2006).

The first step of historical simulation is to identify the instruments in the portfolio and to collect the data about the time series for these instruments in a given past time period. It is necessary to collect enough historical data for the observed instruments. After that, the yield percentages are calculated on the portfolio during a certain time period in the past (it can be a day, a week, a month etc.), according to the given formula (Dowd, 2006):

$$r = \frac{p_1 - p_0}{p_0}$$

With:

p_0 – p_1 - price at the onset of the observation period,

p_1 – p_0 - price at the end of the observation period.

In the second step, the parts of the portfolio for which we wish to calculate the yield are used, so as to simulate the hypothetical yield (for the future time period). This hypothetical yield could be realized under the assumption that the portfolio was held in the time of observation. The third step is the formation of histograms for the simulated portfolio yields. The fourth step is reading the VaR from the histogram of yields, as the given quantile.

The historical simulation has some clear advantages due to its simplicity. It does not make any assumptions about the statistical division, not does it require evaluations of volatility and correlation. All that is needed is the time series of the portfolio yield.

A problem with the historical method is that the results of the historical simulation are completely dependent on the measured results in the given time period (Damnjanović et al., 2017). Therefore, a serious flaw of the historical simulation method is that it assumes that the history will repeat itself. There is a possibility that the price change scenario, which would otherwise cause a significant loss, was not noted in the price history which were used in the historic simulation for VaR calculation.

Results

The four basic steps for calculating the VaR value for the crude oil price fluctuations are:

- Determining the time frame (time horizon) for which the risk evaluation (i.e. possible loss) is being calculated; usually for a single day, ten days, a month, and for one year the longest. In this case, the time periods taken are 50, 250 and 365 days.
- Choosing the confidence interval for which the VaR evaluation is being evaluated, most-commonly 95% and 99%, which was the case in the current analysis as well.
- Adoption of the model for the distribution of probability for the change outcomes for the means or for the portfolio based on the data from the recent past and the broadness of the time window of this data.
- VaR estimate calculation based on the previously adopted criteria and the accuracy control of the VaR mode with the so-called back testing.

In case of a portfolio with multiple assets, the general formula for the calculation of the portfolio value is (Cvetinović, 2008):

$$V = \sum_i f(\beta_i, \alpha_i)$$

where:

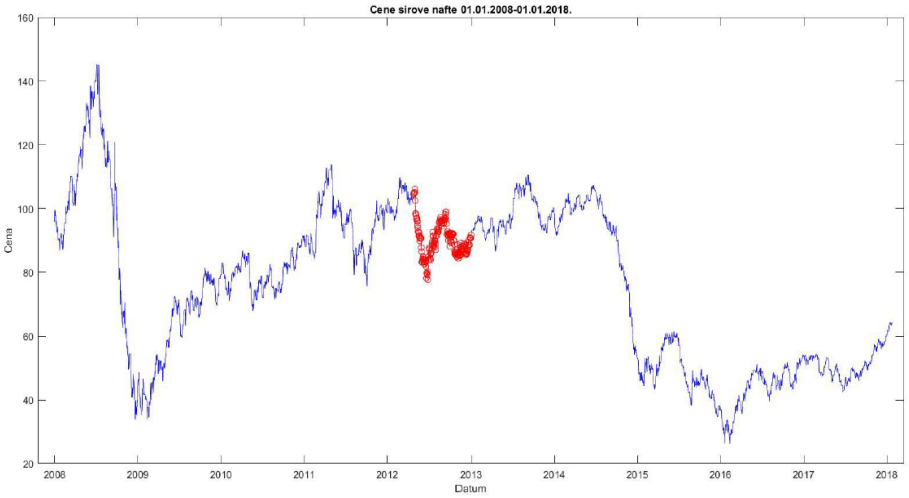
V - portfolio value change,

$f(\square)$ $f(\beta_i, \alpha_i)$ - function determining the value of the portfolio component,

α_i - sensitivity of the portfolio component to the risk factor and

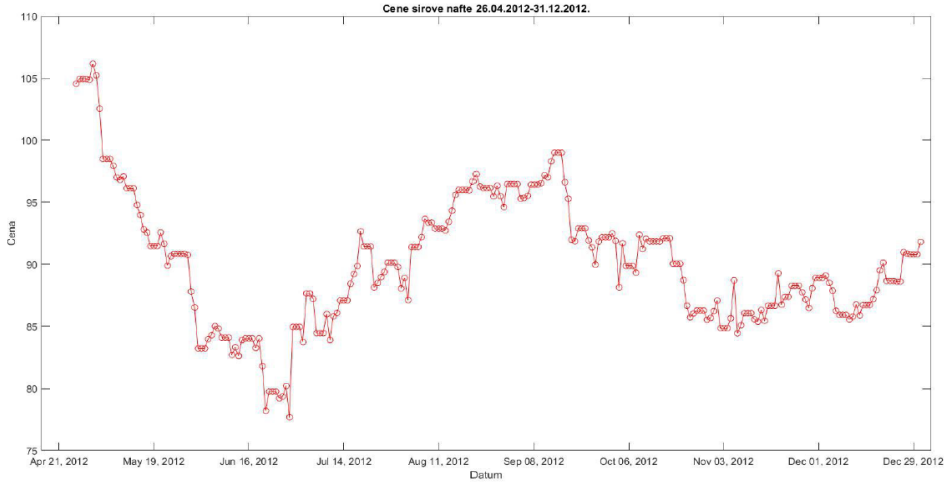
δ_i β_i - percent of price change in the risk factor

Figure 1. Raw crude oil price in the time period 01.01.2008 - 01.01.2018



Source: Authors' calculations

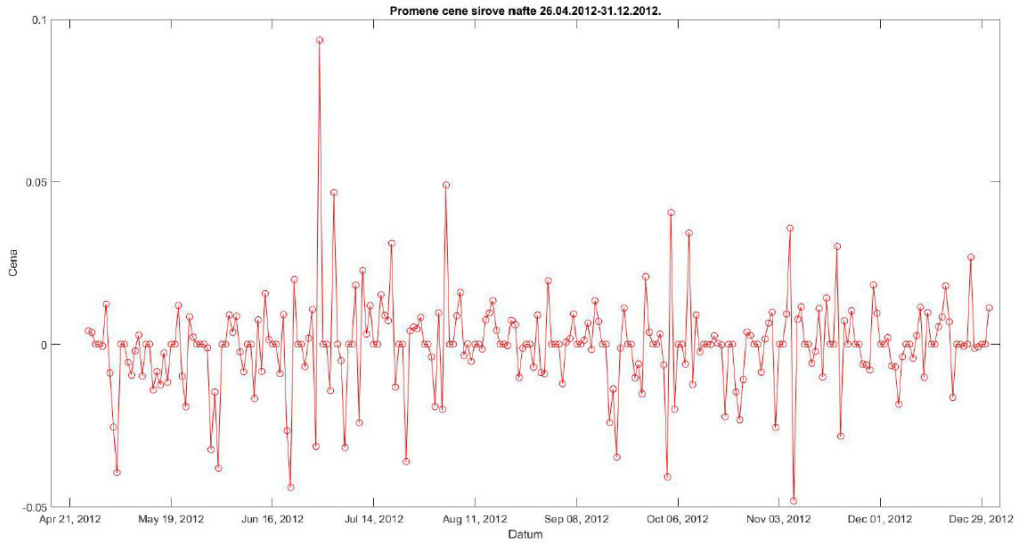
Figure 2. Raw crude oil price in the period 26.04.2012 - 31.12.2012.



Source: Authors' calculations

If the model of historical simulation (The basic Historical Simulation model – BHS) is adopted as the model for the distribution of the probability for the outcomes of change, the method of VaR calculation basically boils down to the analysis of the histogram representing the change in value means. In the Figure 1 the raw oil prices change for the period 01.01.2008 - 01.01.2018 is given(available at: www.macrotrends.net) What is particularly highlighted is the period 28.04.2012 – 31.12.2012, as an example of the time window containing 250 data points which are used for VaR calculations on the day of 01.01.2013. These 250 data points are separately shown in Figure 2, and the adequate changes for the same time period on the Figure 3.

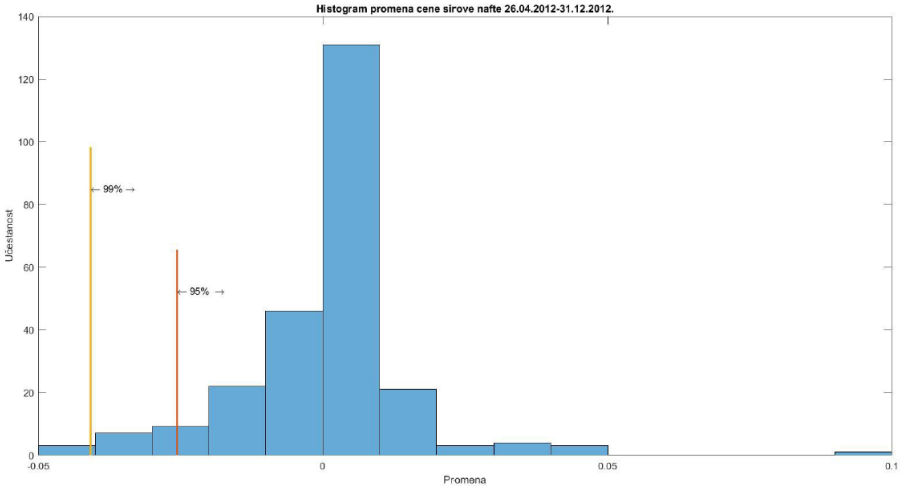
Figure 3. Raw crude oil price in the period 26.04.2012 - 31.12.2012.



Source: Authors' calculations

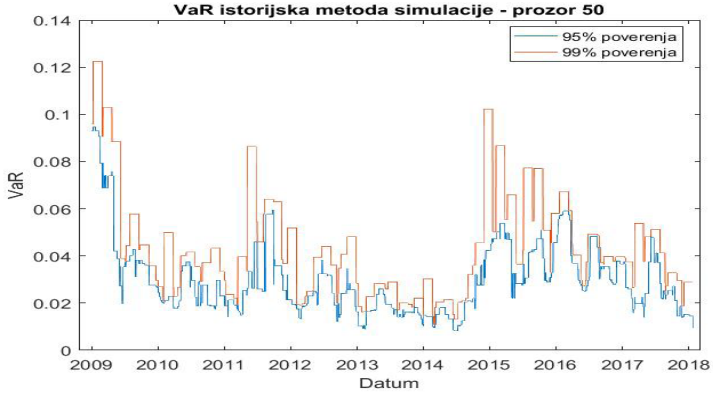
The histogram of crude oil price change from the Figure 3 is given in the Figure 4, with particularly marked vertical lines denoting the borders to the right of which the 95% and 99% variability is. The values on the horizontal line which respond to these borders represent the evaluation of the volatility change of prices with the confidence interval of 95% and 99%.

Figure 4. Histogram of raw crude oil price fluctuation in the period 26.04.2012 - 31.12.2012.



Source: Authors' calculations

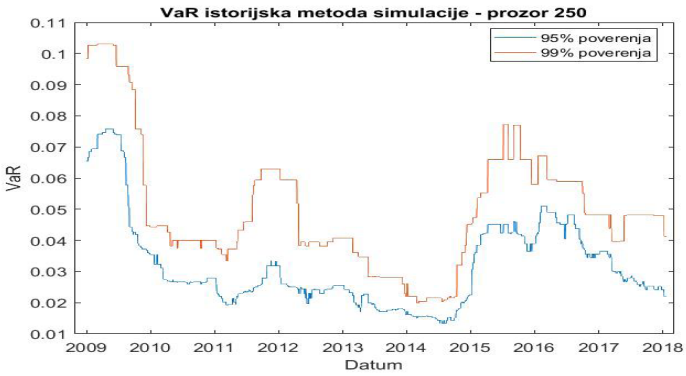
Figure 5. VaR of crude oil prices for the period 01.01.2013 – 01.01.2018 – estimation window of 50 days



Source: Authors' calculations

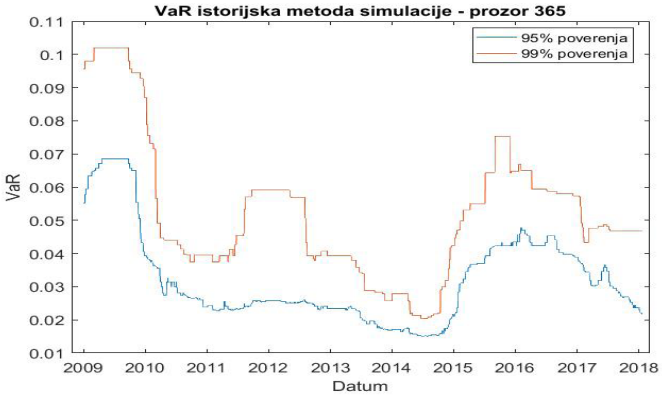
Figure 5, 6 and 7 present the estimated VaR values of the raw crude oil prices for the period 01.01.2013 – 01.01.2018 with the estimation windows of 50, 250 and 365 days, respectively. In all three windows, the VaR value can immediately be noted for the confidence intervals of 99% and the 95%, which was expected. Besides that, it can be noted that the longer the estimation window is, the smaller the daily fluctuation peaks of VaR are. In other words, the VaR value figure becomes smoother. This means that due to stronger influence of more data points from the past, the daily changes noted directly before the day of change have less effect in percentages on the calculated value when the window is larger.

Figure 6. VaR of crude oil prices for the period 01.01.2013 – 01.01.2018 – estimation window is 250 days



Source: Authors' calculations

Figure 7. VaR of crude oil prices for the period 01.01.2013 - 01.01.2018 – estimation window 365 days



Source: Authors' calculations

The described procedure is used for VaR calculation, i.e. for volatility calculation in the time period (time horizon) of one day. If an estimate for a longer period of time is needed (n days) in case of a historical simulation, there is no practically simple way for the single-day VaR to be recalculated for a longer period of time (Cvetinović, 2008). If a parametric method is used, the following formula can be utilized:

$$Vol_{n\ dana} = \sqrt{n} Vol_{1\ dan}$$

So far, there has not been a simple theoretical method to take VaR which was originally calculated using the historical simulation, for one time period and transform it into VaR for another time period, as is possible with the parametric method (Cvetinović, 2008).

Discussions

The data analyzed in the model refer to the period 2002 – 2017. the main reason why the crude oil price change was analyzed in the given time frame are the two key global financial events, which affected the crude oil price change and the price of agricultural production: the financial crisis after 2008 and the crude oil crisis of 2014. Based on that, it was logical to observe this period, having in mind the interdependency between the crude oil price, as one of the key raw materials in the agricultural production, and the behavior of agricultural producers.

Plenty of research in the fluctuation of crude oil prices and the prices of agricultural products in a given time period (Shahzad et al., 2018) show that the change in the price of agricultural products followed the change of crude oil prices. During the world economic crisis 2008 – 2009 a large rise in the price of agricultural products was followed by a large rise in the crude oil price. This shows a great level of correlation(Chatrath et al., 2014). World crude oil market experts explain the fall in crude oil prices in 2014 as a consequence of recession in Europe, the slowed growth in China, return to the global leadership position in domestic production and the stable crude oil reserves in the US, normalization of crude oil production and export in Libya and the inability of Saudi Arabia to decrease its share in the raw crude oil supply to the world within OPEC, since the price of $100 per barrel suited their needs(Ji et al., 2014), and slightly lower prices were less damaging to them than to their competitors. This situation caused the decreased crude oil prices to lead to lower prices of crude oil derivatives, and through that lower calculative production price.

Based on the analysis ran using the VaR method, the agricultural products can form a certain image and expectations regarding the future change in crude oil prices, and therefore raw material prices.

Conclusions

Due to large crises which appear and the raw crude oil price oscillations in the global market, the production costs of agricultural products are rising. The fulfilled results in the agro-sector can affect the foreign trade balance, but also the entire national economy. In order for a company to run successfully, and to make adequate decisions at the right time, it is necessary to continually analyze and manage the risks in the agro-industry. The achieved results in the agro-sector can affect the improvement of the foreign trade balance and the balance of the entire national economy. To survive in the market, it is necessary to continuously follow the political situation and possible wars, as well as properly manage the limited resources.

The historical model of VaR, as well as many other models, does not have the perfect presentation of value for risk minimizing. A problem with the historical method is that the results of the historical simulation completely depend on the data created at a given point in time. On the other hand, the historical VaR method represents a quick and easy way to provide an estimate of future value with a lot of precision.

The VaR model is a good base which can provide us with expected value of the confidence interval from 95% to 99% (Tong et al., 2013). This shows that the use of the historical VaR model for the estimate is a good base for making future decisions of companies. For a more precise estimate and to overcome the flaws of the historical VaR method – which expects that the history will repeat itself, without having a historic record of a similar scenario – it is necessary to use multiple models for the estimation of future models in order to get the optimal result. Because of all of this, a single approach is not enough for risk management on the market, since the results of the analyzed method are far from perfect. However, in synergy with other relevant factors, it represents a good starting point for estimation.

Conflict of interests

The authors declare no conflict of interest.

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CLUSTER DEVELOPMENT AND INNOVATIVE POTENTIAL IN SERBIAN AGRICULTURE

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A B S T R A C T

Science, technological development, innovation, competitive research for innovation, university-industry collaboration in R&D, quality of scientific research institutions and state of cluster development today are key factors of competitiveness and sustainable development of all economies. In this paper authors analyse the correlation of the state of cluster development and innovation in national economies and give recommendations and ways of improving the innovative potential in Serbian economy, with emphasis on agriculture sector. Research hypothesis is set as: expressed positive linear correlation exists between cluster development and national innovation potential, meaning that the countries in which clusters are deep and well-developed are at the same time countries which have a high national innovation potential and vice-versa. The source of the data analysed in this paper is the Competitiveness report of the World Economic Forum 2017-2018. Linear correlation, including confidence intervals, was used in data analysis and research hypothesis is accepted by the data. Application of innovations in production value chain requires stimulating innovation policy of the state, great financial investments in the private sectors, as well as professional support of scientific–research and educational institutions, through the cluster initiatives.

Introduction

The world literature on clusters, as well as numerous documents of the European Commission, emphasize that specialized knowledge, innovations, technology and science are the key factors for growth and prosperity of the national economies, while the clusters represent a strong catalyst of innovation processes and engine/starting device of economic growth and investments.

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Clusters represent extremely complex and sophisticated form of association of producers and suppliers (private sector), scientific and educational institutions and authorities. They provide to joined members sustainable sources of competitive advantages, based on high specialization, efficiency, productivity and innovation performances. The concept of cluster is expression of long time analysed phenomenon of geographic concentration/ agglomeration of economic activities and impact, which these concentrations have on economic growth. Professor Porter defined the cluster as geographic concentration of mutually correlated companies and institutions in some field of activity (one business branch) or, as the institution/enterprise's critical mass at one spot, of peculiar competitive success in specific activity fields (Porter, 1998, page 78).

Successful cluster has the following characteristics (Enright, 2003; Porter, 1998, 2008):

- Geographical proximity of the companies and institutions.
- Successful clusters are concentrated in one or more economic sectors within the region (cluster density), they have width (established horizontal connections with cluster participants) and depth (vertical connections of members in the cluster).
- Successful clusters are characterized by the existence of so called "social glue" (developed confidence, cooperation and partnership among the cluster members).
- Cooperation between the cluster members realizes through intensive cooperation, but also through competitive relation.

The key positive contributions of cluster on cluster members especially in sector of small and medium enterprises are (A Practical Guide to Cluster Development, 2003; Porter, 1998; Porter, 1998, 2008):

- Reducing production costs and increase of productivity.
- Increase of innovation performance. There is expressed causal relationship between the clusters and the capacity of innovations (cluster members, regions, national economy). The clusters have an effect to innovation potential of engaged members, regions and the national economy, but at the same time, high innovation performance of members and stimulating role of the state in motivation of innovation, research and development leads to development of innovation clusters, which, based on knowledge and innovations, build and keep their competitive advantage on the market.
- Increase of competitiveness of members and regions in which the cluster function;
- Stimulating development of entrepreneurship and business environment (specialized labour, developed physical, financial, business infrastructure, etc.).
- Attraction of foreign direct investments and growth of export.

The contribution of developed clusters and social capital to national competitiveness and innovation capability is especially significant for transitional and developing countries, which have repeatedly a lack of resources, knowledge and sophistication (Ketels, Solvell 2005; World Bank, 2009; Paraušić, et. al, 2014; The Impact of Socio-Economic Structure of Rural Population on Success of Rural Development Policy, 2015).

Sustaining economic growth and job creation in the Western Balkans will require a substantive shift toward a more productivity-based, export-oriented growth model. Macroeconomic stability and a market orientation remain important conditions for the development of such a model, but a strategy to unleash the region's innovative potential will be critical, given the magnitude and complexity of the required adjustments in the region's productivity structure (Western Balkans Regional R&D Strategy for Innovation, 2013). Western Balkan countries are often receiving innovative practices and models through foreign direct investment. The precondition for the arrival of foreign investors in a domicile country is to create an attractive and predictable business environment for the flow of foreign capital, with simple and understandable administrative procedures. Developing countries, in which the foreign companies invest, make significant benefits, primarily through the reduction of high unemployment, the improvement of the techniques and technologies of production and management processes, and the increase in exports of the domicile country (Domazet, 2018).

The analysis of the scientific and innovation system of Serbia points to the following characteristics, weaknesses and constraints (Strategy of Scientific and Technological Development of the Republic of Serbia for the period 2016-2020):

✓ Low level of total (below 1% of GDP) and budget investments (below 0.5% of GDP) in R&D;

✓ Research in Serbia is high-quality and covers wide scientific areas, but does not have proper application in practice;

✓ Research is concentrated at universities and institutes and there are no mechanisms, financial instruments and institutional framework to support research and innovation in private sector and cooperation between private sector and science (there are no tax exemptions for companies that implement R&D activities, there is no credit support for innovative enterprise projects, establishment of "spin-off "enterprises by researchers employed in scientific-research organizations is not regulated by applicable laws, financing innovation projects through venture capital funds is not regulated);

✓ Investments of business sector in R&D are very low, especially in comparison with the EU countries. The share of the business sector in research funding in the Republic of Serbia amounts to only 7.5%, and in the OECD countries, the business sector finances 60.8% of all R&D costs;

✓ A small number of researchers and scientists engaged in the business sector. Out of the total number of researchers engaged in Serbia in 2013, only 3.3% were engaged in the business sector, while in the OECD countries this percentage was 59.9% and in the EU 37%;

✓ Lack of infrastructure support for innovation in spite of new institutions in Belgrade, Novi Sad, Niš and Kragujevac (eight business-technical incubators, four science and technology parks, and four technology transfer centers). A large number of business-technology incubators have been established to support spin-off and start-up companies, but they are often donor initiatives for which no long-term and sustainable funding is provided;

- ✓ Low number of patents and technical solutions;
- ✓ Departure of highly educated people from the state.

In all sectors of the economy Serbia have to promote research-industry collaboration, technology transfer and research for commercial purposes and these can be achieved by (Western Balkans Regional R&D Strategy for Innovation, 2013; Strategy of Scientific and Technological Development of the Republic of Serbia for the period 2016-2020; B. Siemen Van, N. Bogdanov, 2012):

- ✓ Improving the incentive regime for collaboration between research institutes, universities, and the private sector: vouchers and matching grants, the establishment of long-term consortia between the public sector (research providers) and the private sector (research users). Incentives that prove effective in other EU countries should be applied in the Republic of Serbia, which will strengthen the role of the economy in research and development through: tax reliefs, customs reliefs, specific exemptions from payments (VAT and tax exemption on the part invested in science), specific credit lines of financing the development of new products and services, etc.
- ✓ Simplification of legal requirements governing the interaction between public research organizations and the enterprise sector (Legislation regulating the management of intellectual property).
- ✓ Investment in innovation and business infrastructure (science and technology parks and business incubators; clusters; laboratories, equipment of scientific-research institutes, quality centres etc.).

Agriculture is an important part of the Serbian economy from the point of GDP share and employment. According to the Agricultural Census 2012, there are 631.552 rural households in Serbia and utilized agricultural area (UAA) amounts to 3.44 million hectares. The agriculture sector is dominated by family farms, which constitute 99.5% of the total number of agricultural holdings and they use 82.2% of UAA.

However, the limitations for development of this sector are numerous (B. Siemen Van, N. Bogdanov 2012; Bogdanov 2015; FAO, 2014):

✓ The prevalence of small - scale farms is the key obstacle for more dynamic growth of Serbian agriculture.

✓ Low productivity is mostly due to a serious lack of organization within the sector;

✓ Volatile agricultural policy and insufficient funding opportunities;

✓ Lack of modern technology and technical assistance. Also, the real needs and priorities of the agro-food sector and the impact of technological development is too rarely a decisive factor in project formulation or the formation of research teams in Serbia.

✓ Recognition of agricultural knowledge and innovation system role on all levels, and fitting it to the real needs is very important, but analytical support

is not developed yet and there are no clear signals for the improvement. No support is provided for applied research in spite of real demand (this lack is only partly compensated by donor support).

One of the priority areas of strategic change in the Strategy of agriculture and Rural Development of the Republic of Serbia (2014–2024) is "Technological development and modernization of agricultural production and processing" (The Strategy of Agriculture and Rural Development of the Republic of Serbia for the period 2014–2024).

In Serbia and other transitional and developing countries as the most important contribution of cluster in sector of agricultural points out a possibility to move a focus of agricultural producers' competitiveness from low prices and labour/natural resources' exploitation to the competition which leans on knowledge, innovations and bio-technical, marketing and other scientific researches (World Bank, 2012).

Still, clusters as innovation catalysts, in Serbian economy and agricultural sector are not sufficiently developed. They are established with the primary objective to apply for public funds for cluster support and they are missing the least common denominator in terms of defining the future interest that gathers cluster members (Mijačić, 2011). In business practice, companies in clusters are inactive, there are no executed cluster projects, clusters are weak in terms of production, human and financial resources, participation of cluster members (particularly scientific research institutions) is at a low level, without established trust or cooperation among them (Paraušić, Simeunović, 2016; Paraušić, et al., 2017). The Institute for Territorial Economic Development (InTER) conducted an analysis of the results of the programme of support for cluster development in Serbia for the period 2007–2015 (Žarković et al. 2016). The results indicated that the programme helped to promote the idea of association in clusters among SMEs and also the successful development of several clusters, especially in the sector of information and communication technologies. However, there is still not enough understanding of the cluster concept and benefits of that type of association of SMEs. The programme was not able to contribute to a higher level of the productivity, competitiveness and innovation of the clusters and SMEs in clusters and also there is still no impact on increasing the membership in the clusters and the strengthening of relations between cluster members (Ibidem).

In addition to underdeveloped clusters, companies in the agro food sector in Serbia are inclined to open innovation, not just those in high - tech industries that are often the subject of innovation literature. Still, the food sector shows greater proclivity for open innovation in comparison with agriculture in all elements apart from the question of willingness to sell intellectual property (Zakić et al., 2017).

ANTARES project in Serbian agriculture sector (2016-2020), implemented by the BioSense Institute of the University of Novi Sad, has been ranked best within one of the most prestigious calls of the European Commission – Horizon 2020 Teaming. The partners of the BioSense are the Ministry of Education, Science and Technological development and Wageningen Research Institute from Netherlands, the world's leading

institution in the field of modern agriculture. Considering that sector of information and communication technology (ICT) has the potential to extremely improve the competitiveness of Serbian economy (Domazet, Lazić, 2017), the ANTARES project, combines two of the most promising sectors in Serbia: IT (information technology) and agriculture. ANTARES aims to turn the BioSense Institute into a European Centre of Excellence for advanced technologies in sustainable agriculture and food security (https://europa.rs/serbian-agriculture-project-ranked-best-in-europe/?lang=en).

Materials and methods

Applied methodological method was desk research, i.e. review and analysis of the secondary data on clusters, national competitiveness and innovation.

For the need of the statistical research and hypothesis testing authors used the World Economic Forum's Competitiveness Report 2017-2018 as data source. The World Economic Forum (abbreviation WEF) is an independent international organization, which publish annually the report „Global Competitiveness Report", in which assesses and ranks countries all over the world according to their national competitiveness (expressed through Global Competitiveness Index/GCI) and numerous variables that are included in calculation of GCI. The most of variables which take into account of the GCI get by the survey (Executive Opinion Survey) with managers of randomly selected companies in each country, while offered answers are on the scale from 1 to 7 (subjective assessments of surveyed enterprises' managers in the countries comprised by the research). The authors used the following two WEF's variables, which take into account of the GCI and take values on a 1 to 7 scale (WEF, 2017):

- ***State of clusters development.*** This variable enters into the calculation of GCI and 11th pillar of competitiveness (Business sophistication). The data are provided on the basis of personal assessment of managers in surveyed companies about cluster development in their country. A question that is asked to the surveyed businessmen is the following: „What is the level of clusters' development and depth in your country? ". The assessment 1 means that there are no clusters in the country, while the assessment 7 points out to high developed and deep clusters in many fields. In accordance to the surveyed businessmen' answers gets an average assessment of clusters development, as well as the ranks of countries in regard to clusters' development.
- ***12th pillar of GCI: Innovation***. That pillar includes the following variables of competitiveness: Capacity for innovation; Quality of scientific research institutions; Company spending on R&D; University-industry collaboration in R&D; Gov't procurement of advanced technology products; Availability of scientists and engineers.

Statistical technique of simple linear correlation (Pearson's coefficient) is used for exploring the nature and strength of correlation between state of cluster development and national innovation on a sample of 137 countries worldwide (1).

$$r = \frac{n\sum xy - \sum x \sum y}{\sqrt{n\sum x^2 - \left(\sum x\right)^2}\sqrt{n\sum y^2 - \left(\sum y\right)^2}} \quad (1)$$

where n is sample size, and x, y – analyzed variables.

The basic assumptions for applying the method of simple linear correlation were fulfilled:

- Relationship between variables is linear (as seen on scatter plot).
- Observed variables have normal distribution.

The sample of 137 countries worldwide is big and representative, as countries in the sample together produce around 99% of world gross domestic product and in the world accounting for 95% of the world's population (WEF 2018).

Working hypothesis is: *There is expressed positive linear correlation between state of cluster development and national innovation*. Formally written, null vs. alternative (research) hypothesis is: $H_0 : \rho = 0.7$ vs. $H_1 : \rho > 0.7$.

Following test statistic is used for testing the null hypothesis (2, 3):

$$Z = \left(Z_r - Z_{0.7}\right)\sqrt{n-3} : N(0,1) \quad (2)$$

Where $$Z_r = \frac{1}{2}\ln\frac{1+r}{1-r} \quad (3)$$

Test statistic Z has, under null hypothesis, standard normal distribution (4):

$$N\left(\frac{1}{2}\ln\frac{1+\rho}{1-\rho}, \frac{1}{n-3}\right) \quad (4).$$

95% confidence interval for the Pearson's correlation coefficient is determined according to the formula (5, 6):

$$I_\rho = \left(\frac{e^{2Z_1}-1}{e^{2Z_1}+1}, \frac{e^{2Z_2}-1}{e^{2Z_2}+1}\right) \quad (5)$$

Where

$$Z_1 = Z_r - \frac{1.96}{\sqrt{n-3}}, \quad Z_2 = Z_r + \frac{1.96}{\sqrt{n-3}} \quad (6)$$

Data were analyzed using the statistical software R.

P-values<0.05 were considered significant.

Results

Authors prove a working hypothesis that there is expressed direct correlation among state of clusters development and national innovation potential.

Table 1. Results of hypothesis testing on correlation between cluster development and national economies' innovation potential
- Sample of 137 countries –

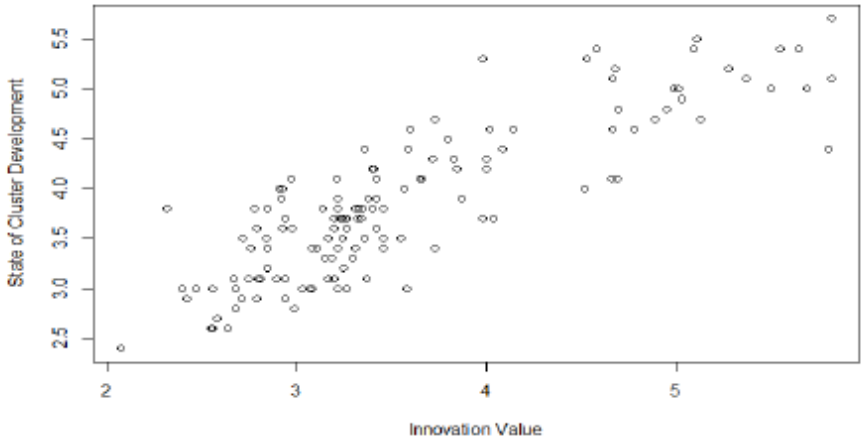
Variable	Pearson's coefficient (r)	β % confidence interval	Realized value of z test statistics	p test value
State of cluster development/ Innovation	0.853	0.800 - 0.893	4.641	0.000

Source: World Economic Forum (2017) & authors' calculations.

The application of Pearson's coefficient points out the following results (Table 1, Figure 1):

- ✓ Coefficient of simple linear correlation (r=0.853) indicates that there is a strong positive correlation between analysed variables.
- ✓ With certainty of 95% can assume that this coefficient will range in interval from 0,800 to 0,893 for all countries in the world,
- ✓ Regarding to the *p* value of the test, authors accepts the alternative hypothesis that in the basic set there is expressed the direct correlation between the cluster and the innovation potential of the national economies: $H_1 : \rho > 0.7$ opposite to $H_0 : \rho = 0.7$.

Figure 1. Linear correlation between state of clusters development and innovation, n=137



Source: Authors' calculations.

Discussions

Authors were proven the hypothesis that there is the causal-consequential relation and expressed direct correlation between the state of clusters development and the national economy's innovation potential: there was accepted $H_1 : \rho > 0.7$, opposite to $H_0 : \rho = 0.7$. This hypothesis was proven using WEF's data which represent the national innovation potential and state of cluster development in the sample of 137 world economies and using Pearson's coefficient of correlation.

Between developed clusters and innovation there is a pronounced correlation in all sectors of the economy, even in the agricultural sector. Innovations are developing better through the clusters, science and technology parks, spin-off companies, and overall innovation infrastructure (laboratories and quality centers, scientific research institutes, business incubators). On the other hand, innovative companies, farmers, suppliers, as well as innovative scientific research organizations, encourage the integration of actors into clusters. Therefore, it can be conclusion that national competitiveness in emerging market and developing economies can be significantly improved by developing clusters and encouraging innovation and productivity within the framework of cluster directed economy.

Conclusions

Innovation and emerging technologies have immense potential to be a source of growth, but their future evolution is uncertain. A key challenge is how to unlock their potential in a way that benefits society as a whole given that they can profoundly reshape the national and global distributions of income and opportunities and lead to significant structural transformations. Job losses are expected as technology transforms manufacturing and services in the coming years, raising questions about how quickly new jobs will be created and about the future of economic development models based on exporting labor-intensive manufacturing products. At the same time, technological advances are creating significant value for consumers, more than is currently reflected in national statistics (WEF, 2017).

Technological improvement, investments in new knowledge and technologies and their transfer to direct users, with cluster development are prerequisites for reducing the technological lag in Serbian agriculture, productivity growth and adaptation to climate change.

The most important is certainly strong and extensive cooperation between universities and scientific institutes and economic entities in research-developmental activities. This cooperation is directly connected to knowledge application in practice, it leads to adjustment of basic, applied and experimental researches, to appropriate expenditure of budgetary resources meant for innovations, as well as to „removal" of scientific researchers from universities and state scientific institutes toward enterprises, clusters and scientific parks. Very important element in this cooperation is a height of funds appropriation (as GDP percentage) for R&D which derives from the economy sector. In the EU documents emphasizes as a goal the increase of funds appropriations for R&D to 3% GDP, along with 2/3 of investments which would derive from the private sector (Europe 2020).

Further progress of the research and innovation system, and therefore the economic and overall development of the Republic of Serbia are not possible without increased material investments in science and research. The EU's Horizon 2020 program predicts that by the end of 2020, total investment in research and innovation should amount to 3% of GDP, of which 1% is from public sources or 1% of the budget. If the Republic of Serbia wants to become part of the European Research Area until 2020, it certainly needs to gradually increase its investment in research, development, science and innovation in order to achieve the goal set by the EU's Horizon 2020 Program. The projection is that by 2020, these budget investments will be 0.6% of GDP, and total investments from all sources of financing will reach 1.5% of GDP, with future investments certainly dependent on economic growth and on available funds in the budget of the Republic of Serbia (Strategy of Scientific and Technological Development of the Republic of Serbia for the period 2016-2020).

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Conflict of interests

The authors declare no conflict of interest.

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PERSPECTIVES OF INNOVATION IN SERBIAN FIRMS- EMPIRICAL EVIDENCE FROM AGRO-FOOD AND SOFTWARE INDUSTRY

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A B S T R A C T

Based on the available literature on theory of innovation and the data processed from the official research on innovation activities in Serbian firms, this paper shows different perspectives of usage of the innovation activities indicators. The results showed that firms involved in software sector are more innovative than firms in agro-food sector. On the basis of the research conducted in this paper, it is possible to draw conclusions which are significant to the management of enterprises in observed industries. According to these recommendations, innovative enterprises management could respond to problematic situation of business economy in the field of innovation management through adequate business strategies. Besides that, empirical research in innovative activities in Serbia in the two observed sectors yield a serious analytic framework to guide industrial policy and employ appropriate measures in order to improve national competitiveness based on knowledge.

Introduction

The increasing attention to the phenomenon of innovation is related to various factors. Some of them are a part of the economic discipline and some of them are related to increasing empirical perception of the importance of technological factors for the competitiveness and growth (Dosi, 1988). The innovation should be viewed in two dimensions at the same time, as a conceptual and as perceptive phenomenon. In fact, successful innovation is the result of systematic analysis and studies of all sources of innovation, but, it is essential that there is recognized need for it (Drucker, 2003).

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Differences in growth rates between industries are well known and quite obvious. Also, the fact is that growth rates in some industries are steadily decreasing, while some other industries show high intensity of growth. Most industries with high R&D intensity appeared in the 20th century, and recorded extremely high growth. Quite obvious was that high growth rates were associated with level of technological innovation as well as with high rate of diffusion of innovations within the global economy. The recognition of the growing role of science and production connections, as well as their empowerment is seen as a national development priority (Lundvall, 1988).The difference between the growth rates and productivity, in different industries, is systematically related to the R&D intensity and the patterns of technical change. Industries with declining growth rates are generally characterized by low levels of R&D intensity and low rate of technological change. However, the existence of a statistical relationship between technological progress and the industries growth does not necessarily mean that only technological innovation fosters the growth (Freeman, 1982). It does not mean that firms that are operating within the low technology intensive sectors achieved lower benefits from their innovations. The result of innovation activities are in line with numerous factors: market demand, customer requirements, competition, and suppliers. Integral part of research innovation performance involves investigating innovation activities. Within the circumstances of changing environment, the innovation is seen as new driver for development not only for the firms, but for whole regions (Gotz, 2015).

"*An innovation is the introduction of a new or significantly improved product, process, organisational method, or marketing method by your enterprise. The innovation must be new to your enterprise, although it could have been originally developed by other enterprises*" (OECD, 2005).

Significantly improved products and processes represent new combination of existing knowledge. Schumpeter's explained that the new combination of existing knowledge means bringing together two aspects of the innovation: existing elements and new elements (Lundvall et al., 2002). Innovation, in this sense, also means, change of economic structure, by introduction the new things and destruction of the old. But the new combination does not just mean technological changes; it highlights the importance of research and development for economic growth and underlines the importance of market power (Tunzelmann, 1995). Through empirical studies about innovation activities in firms, it is possible to create patterns of technological change.

Progress in the analysis of innovation activities at a firm's level has been achieved in the 90s by setting up of the Oslo Manuel and Community Innovation Survey's (CIS). Based on the analysis of data obtained by CIS questionnaire, it is possible to create indicators that can be used as a framework in order to describe innovation activities (OECD, 2005). Information about innovation activities is the main innovation input and CIS data can be used to describe innovation behaviour of firms in particular industries (Franconi & Standler, 2002). Some studies explored motives and impacts of R&D collaboration (Negassi 2004; Cassiman & Veugelers, 2002). Also, some studies put attention on regional aspect as a factor of innovation activities (Copus et

al., 2008; Franconi & Stander, 2002;). Others assessed the implications of innovation activities for innovation policy (Aralica et al., 2008; Knell, 2008) while some point out organisational aspect of technological innovation (Mosurović & Kutlača, 2011). The majority of studies were oriented in order to investigate relationship between R&D and productivity (Mairesse et al., 2002; Knell, 2008).

According to the official national statistical reports (CIS reports), over the past decade, the total number of innovators in Serbia has shown a slight decline in almost all economic activities, except *electricity, gas, steam and air conditioning supply* and *administrative and support service activities*. Innovative firms are defined as those having introduced product or process innovation, innovation in organization or marketing innovation during the observed period. It has been noticed that the differences, in terms of share of innovative firms, are more perceptible between the sectors within the period, than between the observed periods themselves (*Table 1*).

Table 1. Innovation in Serbian firms by NACE classification (2008-2016)

Indicators	Innovation (%)			
	2008-2010	2010-2012	2012-2014	2014-2016
Total	47,9	44,6	40,5	41.2
Agriculture, forestry and fishing	43,2	30,3	22,9	41.9
Mining and quarrying	40,7	37,0	19,3	27.1
Manufacturing	57,6	50,5	42,7	47.9
Electricity, gas, steam and air conditioning supply	42,7	46,2	53,2	53.7
Water supply; sewerage, waste management and remediation activities	38,6	32,5	35,1	31.1
Construction	37,7	40,6	36,2	36.7
Wholesale and retail trade; repair of motor vehicles and motorcycles	43,7	42,0	40,7	31
Transportation and storage	37,9	34,4	31,7	37.3
Accommodation and food service activities	37,5	42,6	46,2	30.8
Information and communication	56,5	53,7	47,6	40.2
Financial and insurance activities	66,9	72,1	36,3	38.1
Real estate activities	36,1	24,4	26,9	8.5
Professional, scientific and technical activities	51,0	50,6	37,5	47.3
Administrative and support service activities	39,0	37,7	43,4	53.1

Source: Statistical Office of the Republic of Serbia (2017). *Indicators of Innovative Activities in the Republic of Serbia, 2014-2016*, Release number 197. Statistical Office of the Republic of Serbia (2015). *Indicators of Innovative Activities in the Republic of Serbia, 2012-2014*, Release number 276. Statistical Office of the Republic of Serbia (2013). *Indicators of Innovative Activities in the Republic of Serbia, 2010-2012*, Release number 285. Statistical Office of the Republic of Serbia (2011). *Indicators of Innovative Activities in the Republic of Serbia, 2008-2010*, Release number 347.

In this paper software industry and agro-food were chosen to be analysed further as areas with high potential for Serbian economic development. The period 2008- 2010 is observed because the complete data base was provided for this period. Innovation is seen as driver for agro-food sector in many industrialized countries that increase competitiveness of the whole sector (Adenle et al., 2017). It can be noted that the agro-food sector is gaining more and more importance in governmental policies which causes some improvements within its own area (strengthening legislation, sustainability, globalization, competition, climate change, public opinion, networking and collaboration, technological innovation) (Mulder, 2008). This sector is very wide and diversified, with different levels of R&D intensity. Agro-food sector is seen as a sector with great potential for development in Serbian economy. But, in terms of sustainable growth rate, Serbia "does not sufficiently use all competitive advantage it has in agriculture and food industry" (Jović et al., 2016).

The software industry has been indicated as the most dynamic and fastest growing sector in Serbia in the last ten years (Živković et.al, 2018). The main specificity of the software sector is mostly shaped by its generic characteristics, which is an important feature that contributes to the rapid and wide diffusion of technologies in almost all industries, and thus the whole economy of certain countries. Evaluation of the innovation potential of companies in the software is a very challenging task because of the character of the software in terms of relatively low cost of production, so that the marginal cost of production is a bad starting point in assessing the revenue of the software (Lippoldt & Stryszowski, 2009).

Information about innovation indicators received on the basis of CIS questionnaires are valuable for decision-makers both on a national economy level and on management level of innovative enterprises. Decision-makers on a national level can gain a better insight into developing innovative process in an enterprise, as well as the innovating influence on the growth of the economy. Furthermore, items of information obtained in this way are possible to be compared among countries, in addition this enables benchmarking of national economic performances. Information received on the basis of CIS reports can serve to construct different models for assessing innovative enterprise capacity and, lastly, to define recommendations for the enterprise management.

Materials and methods

Methodology that was used in empirical part of the research is based on European statistical monitoring of innovation activities at the firm level since 1992- Community Innovation Survey (CIS). CIS methodology is based on Oslo manual created by OECD and contributes to better understanding of innovation processes because at the same time it analyzes the impacts of the innovation on the economy: the impact of innovation on competitiveness, employment, economic growth, and society at whole (Mosurović Ružičić, 2012). Having in mind that most of the empirical researches on innovation activities are closely connected to the data obtained by Community Innovation Survey, this paper examines the information obtained for Serbia, regarding the period 2008-2010.

The survey was conducted on a sample of 3982 firms. Statistical Office of the Republic of Serbia provided the authors with a complete data base (without identification data). This paper further explores connections between numerous CIS questionnaire variables that were not mentioned in the official documents. This enabled a comprehensive analysis of innovation indicators that overcomes the national official reports. The aforementioned data provided the possibility of exploring the type, the scope and the quality of the innovation in two representative sectors: agro-food and software. The aim of the paper is to emphasize the difference between the industries in terms of innovation indicators. The differences are shown through a detailed statistical analysis of the data obtained on a large sample. In addition, the purpose of the obtained results is to be of practical help for decision-makers at the national economy level, as well as at the level of the innovative enterprises in order to improve perspectives of the innovation in Serbian firms. That way, it will be possible to analyze firm's policy towards innovation activities, in terms of informing the companies about the need and effects of innovation, the company's current capacity, and the extent in which some factors accelerate or slow down this type of activity.

For the purposes of the analysis in this paper from the total number of firms, two groups of firms were selected according to NACE classification (NACE Rev. 2): Software industry (SI), 62-64; Agro-food (AF), 10-12. Firms from software and agro-food sectors which have presented technological innovation (product and process innovation) are compared by using: Chi-square test and t- test. The statistical data analysis was done in SPSS program (Statistical Package for the Social Sciences) with intent to determine the (non) existence of statistical differences between firms from software and agro-food sectors, by using Chi-square test and t-test for independent samples, in terms of innovation. This analysis will show in which case there is the statistical difference between observed industries. Frequencies were used for explanation of those differences with aim to determine which industry is more innovative.

Results

The results of the conducted statistical analyses were presented according to chapters of the CIS questionnaire: Technological innovation (product and process innovation), Innovation activities, Sources of information and co-operation for innovation activities, Innovation objectives, Factors hampering innovation activities.

Technological innovation represent *product innovation* and *process innovation*. It can be noticed that firms in both industries were more prone to present a new product than services. But, detailed statistical analysis, conducted by using Chi-square test, indicated a statistically significant difference between software and agro-food sector only in terms of services (in software 47.8%, in agro-food 12%, *Table 2.*). New goods and services in both observed groups are developed mainly by firms themselves (in software 59.4%, in agro-food 70.6%, *Table 2.*). Deeper statistical analysis conducted by using Chi-square test showed that difference between agro-food and software sector was not statistically significant in terms of who developed product innovations (*Table 2.*). In

software industry 69.6% of firms presented technological innovation which was new for their market, while in agro-food sector such innovation was significantly lower, at 29.3%. In terms of innovations that are new only to the firm, the situation turned to be quite the opposite. In agro-food sector, 83.7% firms presented new goods or services that have already been placed on the market by their competitors, while in software sector there were 64.1%. Detailed statistical analysis conducted by using Chi-square test shows that in both cases there are statistically significant difference in the share of the above types of innovation among the analyzed sectors (*Table 2.*).

Process innovation is very important for firms due to its impact on reducing production unit costs and the improvement of good/ service quality. Process innovation includes transformation of the technological knowledge into product-related knowledge (Von Tunzelmann, 1995). In the presented research definition from Oslo Manual (OECD, 2005) was used. According to this, process innovation means *„implementation or adoption of new or significantly improved production or delivery methods. It may involve changes in equipment, human resources, working methods or combination of these* (OECD, 2005). *"*

Based on the data analysis in Firms in software sector assessed that the process innovation are a result of supporting activities for process, such as new or significantly improved supporting activities for processes (84.7%). In agro-food sector, the most important activity of process innovation is new or significantly improved methods of manufacturing or producing goods or services (85.3%, *Table 2.*). Detailed statistical analysis, conducted by using Chi-square test indicated a statistically significant difference between observed sectors, in terms of new or significantly improved logistics, delivery or distribution methods, goods or services in favour of agro-food sector, and supporting activities for process, such as new or significantly improved logistics, delivery or distribution methods for inputs, goods or services in favour of software (*Table 2.*). New processes and products can be introduced as a result of firm's independent and/ or its cooperation with other companies and institutions. The cooperation of the firm with other institutions may be realized as cooperation in the innovation process as well as change and adaptation of process developed by another business entity or institution. In the sector of software the process innovation is developed as a result of joint work of the firm with other firms and/or institutions (84.1%, *Table 2*). In the agro-food sector situation is somewhat different, the process innovation was seen to the greatest extent as a consequence of firm's work itself (66.9%, *Table 2*). A detailed statistical analysis, conducted by Chi-square test, has shown the existence of statistically significant differences between the observed sectors, depending on the innovator*: a firm in cooperation with other firms or institutions; a firm, by adapting or modifying processes originally developed by others; other enterprises or institutions.* Detailed statistical analysis by Chi-square test showed that there are statistically significant differences in the share of the process innovation which were new to the market among the analyzed sectors. Process innovations, new to market were, in software sector 46.2%, while in agro-food sector were 25.3% (*Table 2.*).

Table 2. Testing differences in proportion of technological innovation in AF and SI

Questions		M	SI (%)	AF (%)	χ2- test	(p)	(α)	R
Your firm introduce:	New or significantly improved goods	Yes	77.6	86.9	3.172	0.075	0.05	=
		No	22.4	13.1				
	New or significantly improved services	Yes	47.8	12.0	55.625	0.000	0.05	≠
		No	52.2	88.0				
Who developed product innovation?	Your firm by itself		59.4	70.6	3.612	0.164	0.05	=
	Your firm with other firms or institutions		29.7	19.4				
	Your firm by adapting or modifying processes originally developed by other		10.9	10.0				
Were any of your product innovation?	New to your market	Yes	69.6	29.3	36.673	0.000	0.05	≠
		No	30.4	70.7				
	New to your firm	Yes	64.1	83.7	12.820	0.000	0.05	≠
		No	35.9	16.3				
Did your firm introduce:	New or significantly improved methods of manufacturing or producing goods/services	Yes	83.4	85.3	0.084	0.772	0.05	=
		No	16.6	14.7				
	New or significantly improved logistics, delivery or distribution methods for your inputs, goods or services	Yes	31.7	47.5	5.719	0.017	0.05	≠
		No	68.3	52.5				
	New or significantly improved supporting activities for your processes	Yes	84.7	67.5	8.949	0.003	0.05	≠
		No	15.3	32.5				
Who developed process innovation	Your firm by itself	Yes	68.1	66.9	0.016	0.901	0.05	=
		No	31.9	33.1				
	Your firm with other firms or institutions	Yes	84.1	48.5	22.753	0	0.05	≠
		No	15.9	51.5				
	Your firm by adapting or modifying processes originally developed by others	Yes	44.3	21.3	12.784	0	0.05	≠
		No	55.7	78.7				
	Other enterprises or institutions	Yes	16.6	14.2	0.194	0.659	0.05	=
		No	83.4	85.3				
Process innovations new to your market?	Yes		46.2	25.3	15.946	0	0.05	≠
	No		18.6	40.7				
	Don't know		35.3	34.1				

Source: Authors' calculations, *M- modality of the answer, p-realised level of significance, α- given level of significance, R- test results*

Innovation activities were divided into eight types: in-house R&D, external R&D, acquisition of machinery, equipment and software, acquisition of external knowledge, training for innovative activities, and market introduction of innovations, design and

other. These activities can be also observed as investments whose return will be in the future (OECD, 2005). In the software sector the strongest influence on innovation behaviour of the firm was realized by innovation activity- *training for innovative activities*, and the least effect was associated with *external R&D*. Firms in agro-food sector usually performed *acquisition of machinery, equipment and software* and at least in the area of *acquisition of external knowledge*. It can be seen that in both sectors *acquisition of machinery, equipment and software* and *design* were carried out at almost same level of intensity. Data have shown that the intensity of innovation activities is higher in software sector than in agro-food for selected innovation activities: *in-house R&D, external R&D, acquisition of external knowledge, training for innovative activities, market introduction of innovations, and other* (*Table 3*.). There is statistical significance between observed industries.

Table 3. Testing differences in the proportion of innovation activities for AF and SI

	Frequencies (%)		Rang		Test results
	SI	AF	SI	AF	
Training for innovative activities	93,2	49	1	2	≠
Other	82,2	30	2	6	≠
Acquisition of machinery, equipment and software	73,7	75,4	3	1	=
Market introduction of innovations	70,6	45,8	4	5	≠
In-house R&D	65	49	5	3	≠
Acquisition of external knowledge	56,4	14,1	6	8	≠
Design	55,9	48,1	7	4	=
External R&D	43	25,9	8	7	≠

Source: Authors' calculations

Table 4. Testing differences in the proportion of public financial support for innovation activities in SI and AF

			Industrial area (%)		χ^2 test	(p)	(a)	R
			SI	AF				
Did your enterprise receive any public financial support for innovation activities?	Local or regional authorities	Yes	9.6	5.3	2.248	0.134	0.05	=
		No	90.4	94.7				
	Central government	Yes	27.7	28.9	0.44	0.833	0.05	=
		No	72.3	71.1				
	European Union (EU)	Yes	6.1	1.00	9.484	0.02	0.05	≠
		No	93.9	99				

Source: Authors' calculations, ,p-realised level of significance, α- given level of significance, R- test results

Chi-square test indicated statistically significant difference in terms of receiving financial support for innovation activities from external funds among sectors only in the case of using EU funds in favour of software sector (*Table 4.*).

On the other hand, there was no statistically significant difference between firms that used support of *local or regional authorities* as well as *central government* in

the observed sectors. It indicates non-discriminatory approach to the availability of financial support, in terms of the sectors mentioned.

Innovation sources are very important for selected firms. The firms, in both observed sectors, ranked information provided within the business entity, as the most important for conducting innovation activities. The reason for concern is the fact that the information received from *government or public research institutes* was identified as being the least significant. But, the information obtained from *the university or other higher education institutions* was ranked as extremely important for companies in the agro-food sector, while the firms in software ranked it as irrelevant (*Table 6.*).

Table 5. Test of Equality of Means values of the importance of each source of information among SI and AF

Independent Samples Test						
		Levene's Test		t-test		
		F	Sig.	t	df	Sig.
Within your enterprise or enterprise group	Equal variances assumed	68.090	.000	-7.456	475	.000
	Equal variances not assumed			-11.951	281.059	.000
Suppliers of equipment, materials, components	Equal variances assumed	2.973	.085	-2.271	475	.024
	Equal variances not assumed			-2.278	118.449	.025
Clients or customers	Equal variances assumed	.177	.675	-2.237	475	.026
	Equal variances not assumed			-2.260	119.328	.026
Competitors or other enterprises in your sector	Equal variances assumed	1.953	.163	-3.806	475	.000
	Equal variances not assumed			-3.637	113.140	.000
Consultants, commercial labs, or private R&D	Equal variances assumed	2.541	.112	-.739	475	.461
	Equal variances not assumed			-.825	134.087	.411
Universities and HE institutions	Equal variances assumed	2.403	.122	.311	475	.756
	Equal variances not assumed			.330	125.995	.742
Government or public research institutes	Equal variances assumed	.001	.981	-.450	475	.653
	Equal variances not assumed			-.467	122.682	.641
Conferences, trade fairs, exhibitions	Equal variances assumed	.056	.813	-.410	475	.682
	Equal variances not assumed			-.403	116.233	.687
Scientific journals and trade/technical publication	Equal variances assumed	4.240	.040	-3.590	475	.000
	Equal variances not assumed			-3.708	122.147	.000

Source: Authors' calculations

Table 6. The importance of sources of information for technological innovation in SI and AF

	Software (SI)		Agro-food (AF)	
	Rang	Mean	Rang	Mean
Within your enterprise or enterprise group	1	1.21	1	2.15
Suppliers of equipment, materials, components, or software	3	2.16	4	2.44
Clients or customers	2	2.13	3	2.38
Competitors or other enterprises in your sector	5	2.47	7	2.93
Consultants, commercial labs, or private R&D	7	2.87	8	2.97
Universities or other higher education institutions	9	3.38	2	3.35
Government or public research institutes	10	3.54	10	3.58
Conferences, trade fairs, exhibitions	6	2.54	5	2.59
Scientific journals and trade/technical publication	4	2.30	6	2.72
Professional and industry associations	8	3.12	9	3.11

Source: Authors' calculations

Table 7.Testing differences in proportion of co-operation for technological innovation

Questions	Modality	Industrial area (%)		χ^2 test	(p)	(a)	R
		SI	AF				
Did your firm co-operate on any of innovation activities with others?	Yes	46.3	22.5	19.705	0.000	0.05	≠
	No	53.7	77.5				
Which type of co-operation partner did you find the most valuable for your firm's innovation activities?	Other firms within your group	53.7	77.5	40.201	0.000	0.05	≠
	Suppliers of equipment, materials	13.4	2.8				
	Clients or customers	19.5	9.9				
	Competitors or firms in sector	8.5	1.8				
	Consultants, commercial labs, or private R&D	n<5	2.5				
	Higher education institutions	n<5	4.8				
	Government or public research institutes	n<5	n<5				

Source: Authors' calculations*, p-realised level of significance, α- given level of significance, R- test results*

Detailed statistical analysis conducted by T-test showed that the difference between agro-food and software sector was statistically significant in terms of some innovation sources. Firms in software sector mostly identified market information (*suppliers of equipment, materials, components, or software; clients or customers; competitors; scientific journals and trade/technical publications*) as valuable sources for innovation (*Table 5.*). It is very important to establish cooperation on innovation in order to ensure the smooth flow of information between all actors in national innovation system. This cooperation promotes the sharing and usage of knowledge as between firms themselves

as well as between firms and research institutions. This collaboration also involves the formatting of closer ties with market sources of information for innovation. The firms in the software sector cooperate with other entities and institutions on innovation activities (46.3%, *Table 7.*) to a greater extent than those in agro-food (22.5%, see *Table 7.*). Analysis of responses depending on industry activity of the firms, conducted by using Chi-square test, showed that this difference is statistically significant. The highest level of cooperation on innovation activities in both observed sectors was established within the group to which the firm belongs (software sector 53.7%; agro-food sector 77.5%, *Table 7*). Also, the observed firms established cooperation with clients and customers on innovation activities, but significantly less (software sector 19.9%; agro-food sector 9.9%). Detailed statistical analysis conducted by Chi-square test showed the existence of statistically significant differences between the observed sectors.

Cooperation on development of the innovation in technology based industries records increasing tendency. The level of cooperation with other innovation stakeholders is more significant in firms in software than in agro-food (*Table 7.*). *Innovation objectives* should be considered in the wider context of the introduction of new products or processes.

Table 8. The importance of objectives for technological innovation in SI and AF

Objectives for technological innovation	Software		Agro-food	
	rang	Mean	rang	Mean
Increase range of goods or services	6	2.05	2	2.25
Replace outdated products or processes	4	1.98	3	2.44
Enter new markets or increase market share	3	1.89	10	2.73
Improve quality of goods or services	1	1.52	1	2.00
Improve *flexibility* for producing goods or services	2	1.68	6	2.49
Increase *capacity* for producing goods or services	5	2.02	5	2.48
Reduce labor costs per unit output	7	2.24	7	2.54
Reduce material and energy costs per unit output	8	2.99	8	2.56
Reduce environmental impacts	10	3.50	9	2.57
Improve health or safety of your employees	9	3.35	4	2.46

Source: Authors' calculations

The most significant business objective in agro-food sector was the *penetration into new markets*, while for the software sector; it was the *reduction of harmful environmental impacts* (*Table 8.*).

Table 9. Test of Equality of Means values of the importance of each objective for technological innovation among SI and AF

Independent Samples Test						
		Levene's Test		t-test		
		F	Sig.	t	df	
Increase range of goods or services	Equal variances assumed	4.622	.032	-1.551	475	.122
	Equal variances not assumed			-1.698	130.634	.092
Replace outdated products or processes	Equal variances assumed	9.968	.002	-3.610	475	.000
	Equal variances not assumed			-3.734	122.321	.000
Enter new markets or increase market share	Equal variances assumed	3.675	.056	-6.325	475	.000
	Equal variances not assumed			-6.510	121.691	.000
Improve quality of goods or services	Equal variances assumed	.197	.657	-3.867	475	.000
	Equal variances not assumed			-4.065	124.536	.000
Improve *flexibility* for producing goods/services	Equal variances assumed	2.254	.134	-6.192	475	.000
	Equal variances not assumed			-6.348	121.181	.000
Increase *capacity* for producing goods/services	Equal variances assumed	9.542	.002	-3.308	475	.001
	Equal variances not assumed			-3.548	127.447	.001
Reduce labor costs per unit output	Equal variances assumed	2.026	.155	-2.170	475	.030
	Equal variances not assumed			-2.054	112.164	.042
Reduce material and energy costs/ unit output	Equal variances assumed	1.074	.301	3.208	475	.001
	Equal variances not assumed			2.976	110.254	.004
Reduce material and energy costs/unit/output	Equal variances assumed	46.063	.000	7.003	475	.000
	Equal variances not assumed			8.856	161.751	.000
Improve health or safety of your employees	Equal variances assumed	11.936	.001	6.932	475	.000
	Equal variances not assumed			7.745	134.063	.000

Source: Authors' calculations

Detailed statistical analysis conducted by T-test indicated that there were statistically significant differences between the observed sectors regarding almost all objectives of innovation, with the exception of *range of goods /services incensement* (*Table 9.*). The high importance of process related objectives was identified in sectors. But, in software sector these objectives were a result of improving flexibility for producing goods or services, while in agro-food sector they were indicated as a result of process innovation. According to the CIS methodology, innovative objectives of the firm are divided into three groups (OECD, 2005): (1)objectives related to the product (*increase range of goods or services, replace out-dated products or processes, enter new markets or increase market share , improve quality of goods or services*); (2)objectives related to processes (*increase production flexibility, increase production capacity, reduced labour costs, reduced material consumption*); (3) other objectives (*relating to regulations and standards, improve environmental protection or health and safety at work*). The observed enterprises have marked the *improvement of good/ service quality* as the most important effect of the technological innovation Table 8.).

Factors that hamper product and process innovation activities according to CIS are divided into: *cost factors, knowledge factors, market factors, and other reasons not to innovate*.

Cost factors are related to direct cost of financing innovation activities which are often high. They are closely connected to uncertainty and risk that follow innovation activities. The analysis of responses in on observed sectors, conducted by Chi-square test indicated statistically significant difference in the cost factors in the case of lack of financial resources from its own funds (the highest rank in software 40.9%, the highest rank in agro-food 55.4%, *Table 10.*), as well as in the case of direct innovation costs (the highest rank in software 32.6%, the highest rank in agro-food 35.4%, *Table 10.*) in favour of agro-food sector. On the other hand, there was no statistically significant difference among the firms from observed sectors in terms of lack of funding from outside the firm.

Knowledge factors are closely related to expertise of employees and management. Detailed statistical analysis conducted by using Chi-square test showed that there were statistically significant differences among observed sectors in terms of knowledge factors as limiting factors for innovation activities in these cases*: lack of qualified personnel* (the highest rank in software 3.2%, the highest rank in agro-food 9.0%, *Table 10.*) in favour of agro-food sector; *lack of information on technology* (the highest rank in software 3.2%, the highest rank in agro-food 2.8%, *Table 10.*); more evident in software sector; *lack of information on markets* (the highest rank in software 2.7 %, the highest rank in agro-food 2.8%, *Table 10.*); more evident in agro-food sector.

There were no statistical differences among the observed groups of firms regarding *difficulties in finding cooperation partners for innovation*. Respectively, firms from software sector (11.1%), as well as, firms from agro-food sector (15.4%), have marked difficulty to find adequate cooperation partners as important obstacles.

Market factors are determined by market impacts where technology innovations take place.

Table 10. Testing proportion differences in factors that hamper innovation in AF I SI

Hampering factors		Modality (%)				χ^2 test	(p)	(a)	R
		high	med	low	not expec.				
Lack of funds within your enterprise or group	SI	40.9	42.7	9.8	6.6	16.503	0.001	0.05	≠
	AF	55.4	28.1		13.3				
Lack of finance from sources outside firm	SI	32.1	27.7	17.0	23.2	1.529	0.676	0.05	=
	AF	35.4	24.2	14.4	27.0				
Innovation costs too high	SI	32.6	47.0	4.2	16.2	10.108	0.018	0.05	≠
	AF	47.7	33.5	8.7	10.0				
Lack of qualified personnel	SI	3.2	23.8	43.0	30.0	21.273	0.000	0.05	≠
	AF	9.0	35.8	19.3	36.0				
Lack of information on technology	SI	3.2	43.4	17.4	75.0	38.776	0.000	0.05	≠
	AF	2.8	29.6	28.2	39.4				
Lack of information on markets	SI	2.7	16.7	21.4	59.2	20.131	0.000	0.05	≠
	AF	2.8	19.8	43.6	33.8				

Hampering factors		Modality (%)				χ^2 test	(p)	(a)	R
		high	med	low	not expec.				
Difficulty to find cooperation partners	SI	11.1	30.4	13.6	45.0	5.062	0.167	0.05	=
	AF	15.4	25.9	21.8	36.8				
Market dominated by established firms	SI	25.3	41.2	25.7	7.8	14.012	0.003	0.05	≠
	AF	21.1	31.1	21.6	26.2				
Uncertain demand for innovative products	SI	29.2	51.2	18.4	1.2	23.394	0.000	0.05	≠
	AF	16.5	40.0	23.0	20.4				
No need due to prior innovations by firm	SI	1.7	29.5	13.7	46.8	5.576	0.134	0.05	=
	AF	5.3	21.4	26.0	47.3				
No need because of no demand for innovations	SI	10.1	29.5	13.7	46.8	19.498	0.000	0.05	≠
	AF	3.3	18.5	33.5	44.6				

Source: Authors' calculations, p-realised level of significance, α- given level of significance, R- test results

Dipper statistical analysis conducted by Chi-square test eventually indicated statistically significant difference between observed industries in terms of market factors as factors that hampered innovation activities: market dominated by established enterprises (software 25.3%, agro-food 21.1%, *Table 10.*); uncertain demand for innovative goods or services (software 29.2%, agro-food 16.5%, *Table 10.*). These factors were more important for software sector. Reasons that influence not to innovate are in close relationship with other hampering factors. They depend on market demand as well as the firm's innovation capability. A statistically significant difference was indicated by using Chi-square test, in terms of reasons not to innovate: no need because of any demand for innovations (software 10.1%, agro-food 3.3%, *Table 10.*) in favour of software. This means that the firms involved in software industry respected market's own lack of reason to innovate to a greater extent than the firms involved in agro-food industry did.

Discussions

A detailed statistical analysis has shown a statistical difference within the agro-food and software firms, concerning certain innovation indicators in the observed period. Innovation activities are more frequent in software than in agro-food sector (*Table 11.*).

Table 11. Innovation intensity in software vs. agro-food (- higher, ¯- lower)

Description	SI	AF	Table
New or significantly improved services		¯	2
Product Innovation- new to your market		¯	2
Product Innovation- Only new to your firm	¯		2
New or significantly improved logistics, delivery or distribution methods	¯		2
New or significantly improved supporting activities for your processes, such as maintenance systems, etc.		¯	2
Process innovation development- with other firm or institutions		¯	2
Process innovation development by adapting		¯	2
Process innovations introduced new to market?		¯	2

Description	**SI**	**AF**	**Table**
Innovation activities - Training for innovative activities		–	3
Innovation activities - Other		–	3
Innovation activities - Market introduction of innovations		–	3
Innovation activities - In-house R&D		–	3
Innovation activities - Acquisition of external knowledge		–	3
Innovation activities - External R&D		–	3
Financial support from EU		–	4
Sources of information for technological innovation			
Within your enterprise or enterprise group		–	5,6
Suppliers of equipment, materials, components, or software		–	5,6
Clients or customers		–	5,6
Competitors or other enterprises in your sector		–	5,6
Scientific journals and trade/technical publication		–	5,6
Co-operation on innovation development with firms or institutions	–		7
Partner- Other enterprises within your enterprise group		–	7
Partner- Suppliers of equipment, materials, components		–	7
Partner- Clients or customers		–	7
Partner- Competitors or other enterprises in your sector		–	7
Innovation objectives - Replace outdated products or processes		–	8,9
Innovation objectives - Enter new markets or increase market share		–	8,9
Innovation objectives - Improve quality of goods or services		–	8,9
Innovation objectives - Improve flexibility for producing goods or services		–	8,9
Innovation objectives -Increase capacity for producing goods or services		–	8,9
Innovation objectives - Reduce labor costs per unit output		–	8,9
Innovation objectives - Reduce material and energy costs per unit output	–		8,9
Innovation objectives - Reduce environmental impacts	–		8,9
Innovation objectives - Improve health or safety of your employees	–		8,9
Hampering factors- Lack of funds within your enterprise or group		–	10
Hampering factors - Innovation costs too high	–		10
Hampering factors - Lack of qualified personnel	–		10
Hampering factors - Lack of information on technology		–	10
Hampering factors - Lack of information on markets	–		10
Hampering factors- Market dominated by established enterprises		–	10
Hampering factors - Uncertain demand for innovative goods or services		–	10
Hampering factors - No need because of no demand for innovations		–	10

Source: Authors' calculations

Technological innovation within the firms in both observed sectors are mainly developed within their own research capacity. Having in mind general characteristics of observed work areas, it was expected that, in comparison to the enterprises in agro-food sector, software industry enterprises have directed their innovative efforts towards development of innovative services. Innovations developed in software sector used to be new for the market, not for the enterprises, while in the agro-food area were mostly incremental and represented a novelty solely to the enterprise itself. However, there is a question of how much the software sector innovations are competitive on an

international level (e.g. via coordination of innovative product quality with services including standards and procedures which are prescribed by the foreign market). Gaining competitive advantage on an international market is not a small task since all standards relevant to the product quality on an international scale need to be met. Furthermore, it is necessary to thoroughly explore questions concerning intellectual property rights.

Software firms were more interested in developing their innovation through collaboration with other institutions than agro-food companies. That could be a reason why the software firms achieved a better market position in the observed period. Cooperation on innovation development has not yet reached institutional size and is mostly done ad hoc, as necessary, without any specific planned approach. Namely, less than half of the observed enterprises recognized the importance of a cooperation. Partners for cooperating are mostly found in the market. This fact should be used as an advantage, in addition to this; it would be beneficial that the importance of cooperation with academic society be taken into account as well. Cooperation can be facilitated in multiple ways: franchising; mutual investments; different forms of connection between company's business (national and international initiative), procuring new products and processes, sub-negotiating, and cooperation with other stakeholders in the research and development field.

Establishing and improving collaboration on the level of innovation is possible via development of innovative infrastructure, also. This would be a recommendation mainly aimed at governmental institutions, which should support the development of innovative infrastructure that would enable successful transfer of knowledge and technology from faculties and institutes to economy, both on a national and international level. Scientific, research and developmental activities, as a frame of national innovative system, can achieve visible results only if they are globally competitive. Simultaneously, there has to be an efficient system for diffusing results of these activities in the economy, such that cycle duration from the beginning to commercialization of innovation is shortened to the level dictated by the global market. Namely, enterprises must have successful mechanisms of innovation implementation in order to realize them on the market. This process includes systematic problem solving and it works best when there is a clearly defined strategy and system of decision making, which need to help organization to stop or continue progress process (in the event of it going deteriorate).

Innovation in both observed areas turned out to be based mainly on knowledge and firm's individual research and development investments. Some research has shown that there is close connection between technical skills and R&D cooperation and technological innovation (Leiponen, 2005). Companies in software have shown that education and staff development are important factors for development of innovative enterprises. Only the continuous professional development of employees can improve innovation ability of the firm. Innovation at the firm level among the other factors is determined by formal education, improvement job skills by continuous training, experience, R&D capacity development and ability to manage technological change (Goedhuys & Veugelers, 2012).However, the improvement of the innovative capacity of a firm could

be achieved by training the personnel, providing different levels of specialization. As stated previously, the enterprises of both areas are trying to follow the demands of the market, adjusting their activities accordingly.

The factors, which mostly encumbered performance of innovative activities in both groups of enterprises, are related to lack of financial resources. In observed enterprises in Serbia, financial support of innovative activities is mostly based on central government and very small number of enterprises are requesting a loan to finance solely R&D activities. In both observed sectors, it is a common practice for the enterprises to expect funding of innovative activities to be provided from national funds (agencies, funds, programs etc.). Since the innovations within agro-food industry has been shown to be far more capital intensive, such enterprises are expected to recognize the direct investment costs as a main limiting factor for innovation. At the other hand, in fast-growing research–intensive industry such as software, there is no strong association between high growth and R&D cost. Beside R&D activities, other innovation activities are also important as support to them.

Changes in technology and market demands "are forcing" the innovative enterprises to apply different strategies, exploiting the available resources. The general management position and the "auspicious circumstances" are also the important factors (Freeman, 1982). Innovative enterprise strategy should be an integral part of every enterprise strategy which deals in innovative activities. Nonetheless, under the conditions of transition economy, character of the market itself needs to be investigated since it is evident that a demand for innovative products and services is still a dubious one. Process of innovation and technology diffusion is undergoing constant changes.

Development of a more efficient national innovative system is a necessity for Serbia, if it wants to establish a knowledge-based economy, which is achieved with constant state support. In the areas such as innovative policy, a gap between theory and policy practice should be as smaller as possible. Further development in this area is vital. Development of innovative policy should be molded by practical problems, without researches which are concerned with development of economic theory regarding innovations. Links between innovations and different policies are already recognized in the areas of education, competitiveness, finances, macro-economy, and labor market. Approaches to forming of innovative policy have a tendency to be decided by specific qualities of a country in question, and respond to a unique economic, social and political system of a certain country. However, lately, state and scientists emphasize strongly the trans-national approach and research of "transferable" elements of politics (Holroyd, 2007).

Conclusions

Primarily, paper stressed out the importance of statistical monitoring of innovative activities through Community Innovation Survey (CIS) of the EUROSTAT. Empirical analysis of data in two observed sectors points out that innovation activities, in Serbia, were more intensive in software sector then in agro-food. In some situation firms from agro-food should follow firms from software in order to improve their innovation

behaviour: for example, in terms of level of collaboration and connections with other innovation stakeholders; in terms of creation innovation not only for firm but also for the market like firms in software; in terms of professional development, etc. In order to establish final conclusions and recommendations for further work, one should firstly bear in mind the above mention characteristics of the software sector. Secondly, R&D intensity of agro-food sector should be taken into account and explored further.

On the basis of the research presented in this paper, it is plausible to draw conclusions which are significant to the management of enterprises in observed areas. On the basis of these conclusions, it is possible to provide recommendations for decision-makers in the area of innovative policy:

- *Innovation in accordance with requirements of the international market.* Gaining competitive advantage on an international market is demanding task since all standards relevant to the product quality on an international scale need to be. The special attention should be put on intellectual property issues.
- *Improvement of the collaboration on innovation.* The lack of an adequate cooperation between universities and research institutions with the industry should be further analysed.
- *Investing in the professional development* can improve innovation ability of the firm. Educating and training of employees should be in accordance with the needs of the market, employees and an enterprise. Developed countries increasingly apply the economy growth model based on knowledge.
- *Finding financial recourse on the market.* There are expectations that financing of innovation activities should be done from national sources by government, in both observed sectors. But firms should consider other sources of funding that can be found on international market (venture capital funds, business angels, international funds). Cooperation with foreign partners, as well as applying for various EU funds supporting innovative activities should also be taken into consideration.
- *Strategic approach for managing innovation on a national and entrepreneurial level is needed.* Data gained on the basis of CIS surveys enable insight into indicators that determine innovative capacity of an enterprise, which is significant for the management of innovative enterprises. The empirical research of innovative activities in Serbia within the observed sectors shows the necessity of a serious analytic framework guiding the industrial policy creators in order to develop general and strengthen institutional, economical and technological factors for improving the competitiveness in agro-food and software industries, as well as the industry as a whole, which is necessary if a more efficient entrance in the world market is sought. For the creators of industrial policies, the research can be useful for forming a new industrial policy model, since managing modern economy and channelling changes of

economy structure, especially under conditions of transitional economy, is no longer possible without achieving consistent innovative policy. According to these recommendations, the innovative enterprises management could respond to problems in business economy through the field of innovation management, and formulate adequate business strategies.

The presented research has opened up some topics that could be explored further. Primarily, high technologies have enabled the revitalization of traditional manufacturing industries, as well as economic re-industrialization of developed countries. Firm's productivity – both in agro-food and software sector – turned out to be highly dependent on the application of innovations that were developed in other industrial sectors. In connection to that, a further research should be conducted in order to explore the impact of software on agro-food. Secondly, technological innovations were so far mostly presented within the national market. It's highly recommended for firms in both sectors to present their technological innovation to foreign markets. Finally, it would be more than useful - concerning cooperation on innovation in software sectors - to explore types and levels of cooperation in order to achieve further improvement.

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Conflict of interests

The authors declare no conflict of interest.

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THE EFFECT OF THE STRUCTURE OF MANAGEMENT AND EMPLOYEES ON GUEST'S SATISFACTION OF RESTAURANT PRODUCTS AND SERVICES

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ABSTRACT

The purpose of this research is to define the effects of the structure of management and employees to the guest's satisfaction in terms of quality of restaurant products and services. The methodology used for this research has been the polling of 600 guests in 30 restaurants in Belgrade during 2015. The process of measuring satisfaction was performed by monitoring the attitudes and perceptions of users in terms of quality of products and services, which marks food quality, service quality, and ambience quality and price/quality ratio. The research of educational and age structure, as well as the number of supporting staff and other workers, has been conducted. Correlation and regression analysis were performed with the aim of defining the effect of the educational structure of employees to guest's satisfaction. The results show that restaurant managers should pay special attention to educational levels of employees through regular and permanent education, as they influence the guest's satisfaction.

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Introduction

Customer satisfaction with product and service quality is the basis of stable business and attracting guests. Guests will choose restaurants that meet their expectations and requirements, while the management of the restaurant that does not consider the wishes and requirements of guests will experience a drop in turnover as a result of directing dissatisfied guests towards competing for restaurants (Caruana et al., 2000; Sureshchandar et al., 2002; Seth, Deshmukh, Vrat, 2005; Marinković et al., 2013). For this reason, quality of service and customer satisfaction have become the focus of many researchers because it is found that both factors have an impact on better business and their behaviour (Syed et al., 2011).

Modern literature in the service filed pays great attention to customer satisfaction with products and services, indicating that in order to achieve a high level of customer satisfaction, organizations need to identify, measure and manage the inner elements that produce it (Yuksel, Yuksel, 2002; Wang, 2011).

Previous research (Namkung, Jang, 2007; Kim et al., 2009), have shown that elements of quality according to which customer satisfaction is measured in this study as well (food quality, service quality, environment quality and quality/price ratio) have a significant impact on the operation of the hospitality facility which is closely linked to the qualification structure of employees (Brooks, 2000; Sulek, Hensley, 2004; Han, Ryu, 2009), which confirms that the development of measures for quality improvement is a basic precondition for a successful business and survival on restaurant market (Blesic et al., 2010).

Taking into account heterogeneity of services in the restaurant industry and personal dimension of their realization, it is extremely difficult to reach total customer satisfaction. Measurement of satisfaction enables finding out what is the most important for users of services, how they perceive the specific facility and, finally and most importantly, setting priorities for improvement in order to increase customer satisfaction and thereby profitability of a facility. Many studies have shown that profitability has a direct impact on customer satisfaction (Luo, Homburg, 2007).

The challenges of the modern world, dominated by knowledge and high technology, have imposed that education, knowledge and innovation of employees became key drivers for change management and gaining a competitive advantage (Pološki et al., 2007; Suh et al., 2012), which contributed to researching the significance of education level of employees for the quality of hospitality products and services (Baum, Nickson, 1998; Stewart, 2001; Connolly, McGing, 2006).

By applying the appropriate model, research results will indicate the level of influence and importance the structure of management and staff has on the guest satisfaction with the quality of products and services. The paper will examine the guest satisfaction by assessment of environment, inner atmosphere, quality of service, food, drinks and prices, and then it will show the staff structure in restaurants through the analysis of qualification of all

managerial positions (restaurant manager, banquet manager, kitchen manager) and a number of cooks, waiters, assistant workers, other workers and the total number of employees in Belgrade restaurants. The research was conducted from March till October 2015.

Literature review

Customer satisfaction

Customer satisfaction is considered a key factor in the assessment of organizational performances. Companies try to increase customer satisfaction in order to ensure their competitive advantage, assuming that the implementation of the evaluation of customers gives better organizational results (Martíneztur et al., 2011).

Bolton and Drew (1991) believe that customer satisfaction is a sign of the quality of services provided by the facility.

According to Stevens et al. (1995), the restaurant consumers determine which restaurants meet their quality and value standards and restaurateurs that do not recognize this will experience a decline in consumption, which suggests that the achievement of customer satisfaction and loyalty is realized through the provision of exceptional value (Weiss et al., 2005).

Consumers who are very dissatisfied generally do not complain but leave restaurants, do not use their products and services anymore, in a word they boycott it. In some cases, customers may be satisfied, but do not carry out the re-order. The true economic benefit is achieved through customer satisfaction, which is manifested by their loyalty (Fick, Ritchie, 1991).

A satisfied customer makes recommendations to other potential customers, returns to perform a repeat purchase, and sometimes she/he is ready to pay extra for a product or service of reliable company (Knuston et al., 1992).

The role of education and knowledge of employees in the hospitality industry

For an individual to meet requirements of a particular job, it is necessary to possess adequate qualifications, experience and functional ability (mental and physical capacity), as hospitality workers are in constant and direct contact with people of different mentalities and habits. Significance of education in the hospitality industry has been dealt by authors in different ways, Durrani and Rajagopal (2016) examined what impact on selection of employees has an education level of the management, however it is important to indicate the three main reasons why the education and skills of workers are important for a success of the hospitality facility:

1. In today's scientific environment, only educated personnel can bring a competitive advantage to the organization (Stewart, 2001), there are many examples of companies that successfully operate and whose employees are not well educated and trained, but it cannot be the reason why young people with university degrees should not be employed to improve hospitality businesses, strengthen business of hospitality companies and make them more competitive (Connolly, McGing, 2006).

2. Employees in the hospitality industry are vital for hospitality organization because the ability to provide products and services depends on their enthusiasm.

3. Only a small number of jobs can be performed without qualification because jobs require a specific understanding of hospitality services, guests are representatives of different cultures on which employees must be informed, they should speak different languages, have perfect communication skills, etc. (Baum, Nickson, 1998).

Factors that influence the consumer satisfaction in restaurants

Quality is one of the most commonly used words that are related to food and food service, as well as other products and services that interact with consumers.

Food quality is generally accepted as the main factor affecting customer satisfaction. Sulek and Hensley (2004) suggest that when comparing all aspects of quality, besides ambience, quality of services is also one of the most important parameters (Baker et al., 2002; Kim, Moreo, Yeh, 2004), and the quality of food is the most important element of customer satisfaction. Namkung and Jang (2007) tested the impact of food quality on customer satisfaction and behavioural intentions and found a positive relationship between the attributes that make the quality of the food (e.g. presentation of food, offer types, healthy options, taste, freshness and temperature of food) and customer satisfaction and behavioural intentions. Prestige of local products and national identity also have a positive and statistically significant impact on the assessment of food products (Šapić, Furtula & Durkalić, 2018).

Previous studies have shown that the atmosphere is a key factor in attracting and satisfying customers and increasing financial performances through the market share in the hospitality industry (Heide, Gronhaug, 2009; Zemke, Shoemaker, 2008; Liu, Jang, 2009). The ambience and the scent can influence the consumers' mood, emotion, or a subjective feeling (Chebat et al., 2009). The results showed that the scent of lavender, but not of a lemon, statistically significantly affects the time of guests stay and the amount of spent money (Gueguen, Petr, 2006). Research on effects of olfactory sensations conducted by Zemke and Shoemaker (2007) consisted of measuring the frequency of social interaction; it is proved that ambient scents have a positive correlation with the frequency of social interactions within the facility.

In addition to the food, service, ambience and atmosphere, it is considered that the price can be another factor that affects the customer satisfaction and behavioural intentions (Andaleeb, Conway, 2006). The perceived fairness of prices represents a relationship with the satisfaction and loyalty of clients, which from the standpoint of the consumer price unfairness can lead to a direct negative attitudes and behaviours, such as dissatisfaction, complaints and changes of the restaurant (Xia et al., 2004).

Methodology

Place of research

The survey was conducted on the territory of the City of Belgrade, the capital of the Republic of Serbia, 30 restaurants were selected by a free sample during 2015. In the research and presented results, restaurants are numbered from 1 to 30.

Collecting data on consumer satisfaction

For researching consumer satisfaction with the quality of products and services 600 guests were interviewed using the modified Soriano model (Soriano, 2002). This model assesses the quality of food, service, ambience and price/quality ratio. The model included another element of quality - the atmosphere in restaurants. Evaluation of the studied elements was done using the numerical and verbal scale ranging from 1 to 10, as shown in *Table 1*.

Table 1. Numerical and verbal scale for evaluation of customer satisfaction with quality of restaurant products and services

Mark	Ambience	Internal atmosphere	Service quality	Food and beverage quality	Prices
1	Bad	Bad	Bad	Bad	Very high
2	Moderately bad	Moderately bad	Moderately bad	Moderately bad	High
3	Tolerable	Tolerable	Tolerable	Tolerable	Modestly high
4	Relatively satisfactory	Relatively satisfactory	Relatively satisfactory	Relatively satisfactory	Above average
5	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Above average
6	Below the expected	Below the expected	Below the expected	Below the expected	Relatively as expected
7	Relatively as expected	Relatively as expected	Relatively as expected	Relatively as expected	Expected
8	Expected	Expected	Expected	Expected	Below the expected
9	Above the expected	Above the expected	Above the expected	Above the expected	Favorable
10	Exceptional	Exceptional	Exceptional	Exceptional	Extremely favorable

Costumers were surveyed immediately after using the products and services, while their memories and impressions were fresh.

Collecting data on the structure of management and employees

Collecting data on the structure of management and employees was conducted through interviews with the management and employees in the analysed hospitality facilities, collecting data on the number, age and qualifications of employees.

Calculation of index of qualification structure used the following scoring system:

- the greatest value of 10 is given to faculty graduates,
- 9 points to college graduates,
- 8 points to staff that completed one-year specialisation after high School,
- 7 points to high school graduates,
- 6 to three-year secondary school graduates and
- 5 to unqualified staff (Krasavčić, 2012).

Statistical data processing

Data analysis was performed using the statistical software Statistics 10 and Eviews 3.1. Basic characteristics of the observed variables (phenomena) in both research phases were calculated using indicators of descriptive statistics (Stojković, 2008): mean, extreme values (minimum and maximum), standard deviation and coefficient of variation.

Regression and correlation analysis is performed below to determine the level and form of influence and dependence between the structure of employees on the studied parameters of guest satisfaction using the method of regression analysis, which ensures accurate and valid results, which, in this paper, was done by applying:

- simple linear regression and

- multiple linear regression.

In order to achieve the aim of research to examine the impact of the structure of human resources on guest satisfaction with the quality of products and services, regression analysis was performed. The first phase of implementation of this method defined variables to be taken into account in the assessment of adequate regression models.

As an indicator of guest satisfaction, which in a regression analysis is a dependent variable (Y), it was observed an average score of quality of products and services, which in its value contains information on all five properties that make the evaluated quality, namely: ambience, atmosphere, and quality of service, quality of food, drinks and prices.

The influence of the structure of employees as a factor is an independent variable (X), which is observed on the basis of:

- index of the qualification structure (X_1);
- age of workers (X_2);
- other workers (X_3);
- assistant workers (X_4);
- sensory quality of food (X_5);
- quality of other services (X_6);

- ambience (X_7);
- inner atmosphere (X_8);
- quality of service (X_9);
- quality of food and beverages (X_{10}) and
- prices (X_{11}).

In applying the multiple regressions, the focus is on the proper choice of model and the proper interpretation of the results.

Starting from the analysed phenomena in the work, appropriate models are selected that reflect the influence of the structure of employees on guest satisfaction with the quality of restaurant food and service.

The application of the method of regression analysis in research is followed by certain problems such as problems in the selection of variables, problems of assessment of parameters, autocorrelation, multicollinearity, and others which was taken into account in the analysis wherein some of the problems are eliminated in order to obtain more accurate and valid results.

The phase of checking the adequacy of the selected model means checking fulfilment of model assumptions which uses different tests. The paper for each selected model tested the significance using the method of analysis of variance, that is, by performing F - test.

Results and discussion

Analysis of guest satisfaction with quality of restaurant products and services

Based on the overall mean of evaluations of all quality indicators in *Table 2* it can be concluded that guest satisfaction is at a slightly lower level than expected one ($\overline{X}$ =7.23) and the coefficient of variation is 22.45%.

Table 2. Basic indicators of consumer satisfaction with the quality of products and services

Indicators	Average value ($\overline{X}$)	Variation interval		Standard deviation (σ)	Coefficient of variation (V%)
		Minimum	Maximum		
Ambience	7.83	4.00	10.00	1.72	22.01
Atmosphere	7,70	4.00	10.00	1.74	22.66
Service quality	7,57	5.00	10,00	1.52	20.14
Food and beverage quality	7.30	5.00	10.00	1.42	19.42
Prices	6.27	3.00	9,00	1.84	29.31
Total mark	**7.23**	**3.10**	**9.40**	**1.62**	**22.45**

Guests are most satisfied with the ambience ($\overline{X}$ =7.83; V=22.01%) and inner atmosphere ($\overline{X}$ =7.70; V=22.66%). The lowest average score the guests assigned to prices ($\overline{X}$ =6.27; V=29.31%), thus it can be considered that they are least satisfied with

this element, or that the prices are slightly higher than expected. This price estimation by guests caused the overall evaluation of the quality of the restaurants ($\overline{X}$ =7.23) to be lower than expected.

Analysis of the structure of management and employees in the restaurant industry

The average age of employees in the facilities is 34 years, and varies in the range from 25, the minimal recorded age, up to a maximum recorded age, which is 45 years, which confirms the coefficient of variation of 16.89% (*Table 3*).

Table 3. Structure of management and other employees

INDICATORS	AVERAGE VALUE ($\overline{X}$)	VARIATION INTERVAL		STANDARD DEVIATION(σ)	COEFFICIENT OF VARIATION (V %)
		Minimum	Maximum		
Total number of workers	16.00	5.00	26.00	5.16	32.01
Age of workers	33.73	25.00	45.00	5.70	16.89
Number of assisting workers	3.00	0.00	18.00	3.61	121.53
Number of other workers	2.00	0.00	11.00	3.17	141.93
Index of skills structure	**6.68**	**5.60**	**8.55**	**0.72**	**10.79**

Not all the restaurants have auxiliary and support staff. There are restaurants that do not have any, and those with up to 18 auxiliary and 11 other workers. Thirteen of the thirty facilities employ other workers, and twenty of them have auxiliary workers. The average number of other employees, where available, is two and the maximum number is eleven (restaurant no. 14). Facilities employ on average three auxiliary workers, and most of them are employed in the facility no. 22, that is, eighteen of them. The coefficient of variation for auxiliary workers is 121.53%, and for other workers is even higher (141.93%), which indicates that there are restaurants that employ a large number of semi-skilled and unskilled labour and that there are huge differences among them.

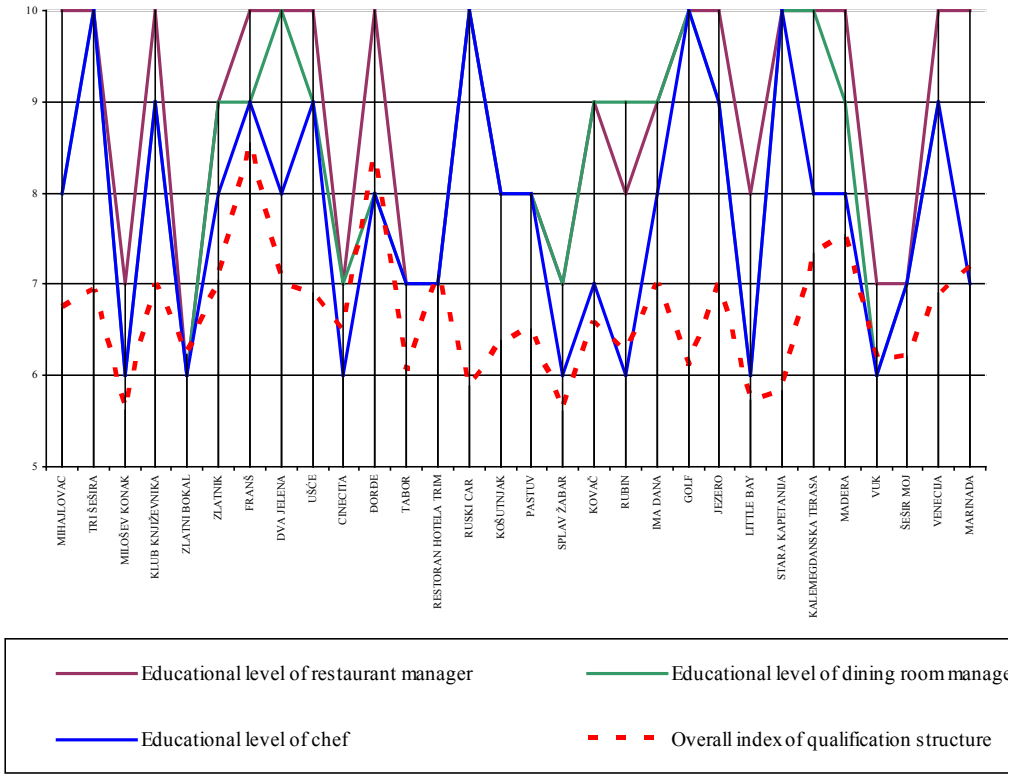
Analysis of the index of employee qualification structure

Positions in the observed objects are structured as follows: restaurant manager, banquet manager, kitchen manager, chef and waiter. Within the defined positions, facilities employ a various number of workers of various qualifications. Starting from this diversity both in number and in qualifications of employees, in order to compare the observed facilities, we calculated values of the qualification structure, which takes into account the observed differences.

Managers are the basis and prerequisite of a successful operation of modern enterprises (Emenheiser, Clay, Palakurthi, 1998) therefore in determining the index of qualification structure as a good indicator of the state of the structure of employees the highest score

is assigned to employees who have the highest level of education. As a rule, these are the managers regardless of which operating managerial positions they hold.

Figure 1. Trends in values of the index of the qualification structure in the restaurant industry in Belgrade (10 - Faculty graduates, 9 - college graduates, 8 - completed one-year specialization after high school, 7 - high school graduates, 6 - three-year secondary school graduates and 5 - unqualified)



The highest number of restaurants have the qualification structure index between 6 and 7 while restaurants 14, 24, 23, 3 and 17 have the lowest qualification structure and the qualification structure index is less than 6; Restaurants, 4, 6, 7, 8, 13, 25 and 26 have a high index of qualification structure (over 7), indicating that their management and other professional workers have the highest qualifications.

The restaurant no. 7 has the largest index on the basis of the qualification structure of employees with an average score of 8.55. This restaurant employs ten workers, one of whom with a university degree as a manager of the restaurant. Banquet manager has collage degree or sixth level of qualifications, as is the case with the kitchen manager, while the remaining employees have a one-year specialization after high school.

Slightly lower index with an average score of 8.40 has the restaurant no. 11. This restaurant employs eleven employees, of which one with a university degree as a manager

of the restaurant. Banquet managers and kitchen manager are workers with a one-year specialization completed after high school, while the rest, i.e. cooks and waiters, also have secondary education including five workers with completed specialization.

The lowest index of employee qualification structure of 5.60 has the restaurant no. 17 with twenty employees. The restaurant manager is a four-year high school graduate, which is the case with the banquet manager, while the kitchen manager has completed tree-year high school.

Analysis of the impact of the structure of employees on guest satisfaction

Analysis of total qualification structure index of employees within hospitality facilities and guest satisfaction showed some deviation in the restaurants no. 15, 16 and 24, where guest satisfaction is below the average for the qualification structure of employees (*Figure 2*).

Figure 2. Relationship between qualification structure and guest satisfaction

Analysis of dependence of guest satisfaction on individual quality factors

The dependence of satisfaction of observed factors is viewed on the basis of the values of simple correlation coefficients, which are expanded with the parameters that relate to the sensory quality of food and the quality of other services provided by hospitality facilities (*Table 4*).

Sensory quality is processed based on parameters that are related to aroma, juiciness, tenderness, taste and remainder in chewing of selected dishes. The average score for quality of food is 5.23, which indicates that the evaluated food at Belgrade restaurants has a moderate quality. The minimum score for food quality has two facilities and it is 3.2 (moderately poor). The maximum score for quality of food as a whole on the basis of five properties was 6.6 (very high quality).

The mean of the total number of positive responses about other services that are related to the availability of bartender, waiter for flambé, implemented HACCP, wine offer and foreign language skills of employees are 5.33 and are characterized by moderate variability, which expressed by the coefficient of variation is around 21%. The values of simple correlation coefficients in Table 5 show that the level of guest satisfaction is significantly affected by the majority of observed factors.

Table 4. Additional parameters: analysis of sensory quality of food and other services

INDICATORS	AVERAGE VALUE ($\overline{X}$)	VARIATION INTERVAL		STANDARD DEVIATION(σ)	COEFFICIENT OF VARIATION (V %)
		Minimum	Maximum		
Sensory quality of food	5.23	3.20	6.60	0.99	19.01
Other services	5.33	4.00	7.00	1.12	21.08

The greatest impact is shown by ambience and quality of service (r = 0.85) followed by the inner atmosphere (r = 0.78), quality of food and beverages (r = 0.76), the average score of sensory quality of food and price (r = 0.72), the index of the qualification structure (r = 0.71) and with the lowest impact is workers age (r = 0.37). It is worth noting that the price largely depends on the type of restaurant (Berardi et al., 2014).

Although all of these variables significantly influence the satisfaction, due to high dependence between some of them, in order to avoid the presence of multicollinearity in models and thus bringing into question the validity of the obtained evaluation parameters, these variables are not included together in a model. On the other hand, to investigate and quantify their impact on satisfaction several models are rated. The matrix of correlation coefficients of the set of variables is given in *Table 5*.

The influence of the structure of managers and employees on guest satisfaction is reviewed based on the following model (M1):

$$\hat{Y} = - 5.354 + + 1.504X_1\ 0.075X_2$$

As factors that significantly affect the guest satisfaction, this model included the qualification structure index and the average age of workers. Both included factors have a positive impact, that is, they both increase the level of guest satisfaction. The values show that when these elements of management are in question, the greater relative impact on the level of satisfaction has the expertise of managers and staff expressed by the qualification structure index level and the impact based on the value of the standardized coefficient of regression is about 67%. The relative influence of the average age of workers on guest satisfaction, based on the same indicator is 26.5%.

The estimated model as a whole shows statistical significance (F = 17.99), as well as both, included independent variables ($t_1 = 5.23$, $t_2 = 2.07$), thus the model is considered as appropriate for the analysis of the impact of the management structure and staff

on the guest satisfaction. Also based on this model it is concluded that the level of satisfaction of 54% is explained by the influence of index of qualification structure of employees and the average age of employees.

Table 5. Matrix of correlation coefficients of set of variables

Variables	Y_1	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}
Y_1	1.00	0.71**	0.37**	-0.17	0.01	0.72**	0.35	0.85**	0.78**	0.85**	0.76**	0.72**
X_1		1.00	0.16	-0.24	-0.08	0.74**	0.43**	0.59**	0.50**	0.64**	0.71**	0.54**
X_2			1.00	-0.24	0.25	0.19	-0.02	0.21	0.15	0.32	0.24	0.37**
X_3				1.00	0.56**	0.01	0.05	-0.19	-0.22	-0.26	-0.05	-0.06
X_4					1.00	0.02	-0.08	-0.15	-0.16	-0.02	0.19	0.12
X_5						1.00	0.39**	0.66**	0.56**	0.71**	0.69**	0.57**
X_6							1.00	0.40**	0.32	0.33	0.30	0.42**
X_7								1.00	0.83**	0.68**	0.56**	0.62**
X_8									1.00	0.71**	0.54**	0.49**
X_9										1.00	0.76**	0.66**
X_{10}											1.00	0.63**
X_{11}												1.00

If we look at the elements that make the guest satisfaction with quality, namely: ambience, inner atmosphere, quality of service, quality of food and drinks and prices, they all show a significant impact on satisfaction. However, there is also a statistical relationship between the elements themselves, and they cannot be included in the model together. The element that shows the greatest impact on satisfaction is the quality of service (r = 0.66) and based on that the following model is estimated (M_2):

$$\hat{Y} = 0.344 + 0.910X_9$$

This model shows that the improvement of the quality of services brings an increase in the level of guest satisfaction. In addition of showing that the model as a whole is statistically significant, the values in Table 6 show that the explanation of the change in the level of satisfaction, influenced by an increase in quality of services is 72%.

The positive influence of qualification structure of managers and elements of satisfaction on increase in satisfaction is demonstrated by the previously estimated models in which the impact of these factors is observed independently of each other. In order to evaluate their synergetic effects on the satisfaction, we also estimated models in which these two groups of factors are included together.

Starting from the fact that the matrix of simple correlation coefficients shows that the greatest impact on satisfaction has the index of qualification structure of employees and the quality of service, firstly we estimated the model (M3) which includes these two variables:

$$\hat{Y} = - 2.403 + 0.625X_1 + 0.722\ X_9$$

Assessment of this model significantly increased explanation of the change in satisfaction and reduced error of the model of estimated parameters, which together gives more valid results using this model for prognostic purposes. Applying automatic selection of variables by exclusion from the beginning the following regression model (M4) is estimated to examine the impact of management and elements of satisfaction on its change:

$$\hat{Y} = - 3.846 + 0.690X_1 + 0.055\ X_2 + 0.590\ X_7$$

This model included the tree of the starting eleven independent variables. Selected variables have statistically significant, positive impact on the level of customer satisfaction.

The values of standardized regression coefficients show that when observing this set of variables, the greatest relative impact on satisfaction has the ambience with 63%, the index of qualification structure with 31%, and the average age of workers with 19%. The overall explanation of the change in satisfaction by this set of variables is 80% ($\overline{R}^2 = 0{,}799$). In order to compare all of the estimated models in the analysis of customer satisfaction, depending on the observed factors, their verification has been made based on statistical tests of the first order (Table 6).

Table 6. Estimates of model for examination of customer satisfaction based on statistical criteria

Models	First row tests			
	F-distribution	R^2	$\overline{R}^2$	S_e
M1	17.99**	0.57	0.54	1.10
M2	75.80**	0.73	0.72	0.86
M3	46.74**	0.78	0.76	0.80
M4	39.45**	0.82	0.80	0.73

The table shows that all the estimated models are statistically significant (F-relationship). The greatest explanation of satisfaction is given by the model M4 as it has the highest value of the coefficient of determination (R^2) and adjusted coefficient of determination ($\overline{R}^2$).

Conclusion

Based on research and statistical analysis of data using appropriate models it was concluded that guest satisfaction with overall quality of restaurant products and services is at a low level. Guests are most satisfied with ambience and inner atmosphere and least satisfied with prices.

Based on the results it was concluded that restaurants employ a large number of semi-qualified and unqualified labour and there are huge differences between them. This has led to that the most of the facilities have a low index of qualification structure, which is the case with management as well.

The statistical survey of the influence of the structure of management and staff on guest satisfaction with the quality of hospitality services confirmed a significant influence. According to the obtained values, the greatest impact on satisfaction has the ambience and quality of services, followed by an inner atmosphere, quality of food and drinks and the average score of dishes and prices.

Applying adequate regression models led to the conclusion that the qualification structure index and the average age of workers have a significant impact on guest satisfaction, with the greatest impact on the quality of services and the ambience. Here the question is what elements of the ambience are crucial. Among the important elements of the ambience Gaurav and Kartik (2012) state colours and lighting, which should be further explored.

When one takes into account the heterogeneity of services in the restaurant industry and personal dimension of their implementation, it is extremely difficult to achieve full satisfaction of consumers. The task of management is to organize the business by creating a positive relationship between all levels of the organization hierarchy, which will be transferred to the customer as she/he will be welcomed, comfortably housed, well served, hosted, and in the end pleasantly accompanied from the hospitality facility (Baraban, Durocher, 2001).

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Conflict of interests

The authors declare no conflict of interest.

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TARGETING MARKETS FOR EXPORT OF MACEDONIAN WINES TO THE EU

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ABSTRACT

The Republic of Macedonia has all the prerequisites for production of high quality wines and has great export potential, but Macedonian wines are almost unknown on the world wine market. Another problem is that most of the exported quantity is bulk wine, although in recent years the ratio between bulk and bottled wine started to change positively in terms of bottled wine. The wine market in the European Union is the most important export destination for Macedonian wines. Given the specificities of the wine market of individual member states, the aim of this paper is to select the countries in which the largest export of wine can be achieved. Macedonian wineries need to focus their export effort on the following markets: Germany, The Netherlands, Poland, Denmark and the Czech Republic. Methodology of desk research and market analysis is used for the conclusions.

Introduction

Wine is one of the symbols of Macedonia. The secret of Macedonian wines comes from the sun, which affects the taste of the grapes itself. Wine is not something new in this region, since wine is being made here from Ancient times. Vines have been cultivated 4,000 years ago and a large number of artifacts found on ancient sites confirms this ("Wine industry", 2015).

Grapes are a traditional and important agricultural crop for Macedonia. In rural areas, the cultivation of grapes engages the local population and has particular importance for the production of wine. Viticulture is probably the most important and strategic industry in the field of crop production (Economic chamber of Macedonia, 2005). In the period 2010-2016, the areas under vineyards were constant and range around 25,000 hectares, which is 0.4% of the world area with vineyards. Individuals (80%) own most of them, and the remaining 20% were privatized in the early 1990s (WOM, 2015).

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In Macedonia, 28 grape varieties are grown, and the presence of white and black varieties is equal to 50% (WOM, 2017a). Vranec is the most common black variety, while Smederevka is most used white variety, but is unfortunately primarily used for the production of white wines of lower quality and distillation for brandy production (WOM, 2015, p.8).

According to climatic conditions, Macedonia is classified as one geographical area. It is considered a region for producing regional wine that is suitable for the entire territory of the country. Furthermore, this region is divided into 16 wine districts for production of quality wine. Each of them is characterized by different conditions and production capacity (Beleski, 2014).

In 2016, in Macedonia 75 wineries were registered (WOM, 2017a). The industry purchases from "250 to 300 thousand tons of grapes per year depending on the harvest and produces 95-120 million liters, which directly affects the development of the country's agriculture. Grape and wine exports account for 17-20% of the GDP in Macedonia and wine is the second most important export agricultural product, after tobacco, while wine exports contribute with foreign exchange inflows of 50 million euros a year" (WOM, 2017a, p.12).

Macedonian wineries have a total production capacity of 2.1 million hl, but use only half of it. The total bottling capacity, however, is about 650,000 hl per year, which is insufficient to cover the entire wine production in the country. Although insufficient capacity, bottling capacity remain unused because most of the wine is sold as a bulk (MAFWE, 2010). Almost 74% of the produced wine in Macedonia in 2016 was intended for export. The key export destination in 2016 was the European Union (EU), which accounts for 57% of total exports in volume and 44% in value, followed by the Balkan countries with a share of 38% in volume and 45% in value (WOM, 2017b).

Since 2013, the ratio between bulk and bottled wine has begun to change in favor of exporting bottled wine. For the Macedonian wine industry, the structure of the exported wine is especially important, given that bottled wine is more profitable and although the quantities of bottled wine are smaller, they provide almost 50% of the value of the exported wine. Wineries that export wine to the EU by 2014 faced the problem of high tariffs for the amount exceeding the approved quotas for import of bulk wine, and in 2015 and 2016 the same thing happened with bottled wine (WOM, 2017a).

In order to analyze the macro-environment in which Macedonian wineries operate, it is necessary to analyze the political, economic, social and technological factors that influence the wine industry in the Republic of Macedonia.

The most prominent political factor is the stabilization of the political situation in the country in 2017 after long confrontations between political parties, since it is ultimately expected that it will positively affect the functioning of the entire economy, including the wine sector. Another factor is the permanent delay of the Euro-Atlantic integration of the country, mostly due to the name dispute between Greece and the Republic of Macedonia. This also affects the process of protecting geographical indications for wine in the Re-

public of Macedonia. The state through the competent institutions has a great influence in determining the price for the purchase of grapes during the harvest period. The goal is protection of vinegrowers, and this measure is used in daily political campaigns.

The signed Protocol for export of Macedonian wine to the EU under the Stabilization and Association Agreement with the EU since 2004 is an economic factor of great importance. It enables the export of large quantities of wine to the EU without customs duties, which makes Macedonian wine competitive on the EU market. Other economic factors are:

1) Determining viticulture and wine production as a strategic branch of the Republic of Macedonia, which opens up opportunities for vinegrowers and wineries to use the funds from the IPARD Program for Support of Agriculture and Rural Development,

2) The Government additionally provides financial support for wine exporters primarily through support of marketing and promotional activities,

3) Domestic production of wine is still significant, especially in the smaller towns along Vardar River,

4) Protection of domestic wine producers with a customs rate for importing wine, which contributes to very limited distribution of foreign wines on the domestic market; and

5) There is not excise duty for the wine as an alcoholic beverage.

Social factor affecting the wine industry is the low purchasing power of the population that limits consumption of high quality wine only on special occasions. In Macedonia, the wine culture is still at a very low level and continues the tradition of production and consumption of domestic poor quality wine, especially outside Skopje. The emigration of young educated people from the country is increasing and this group of people is leading the trend of consumption of high quality wine. Another factor is the change in the structure of the available labor during the harvest period, primarily due to the opening of the "Dräxlmaier" factory in Kavadarci where a large number of workers were employed and the wineries started to face the problem of providing the necessary workforce in the period the harvest.

From the technological aspect, the significance of large investments in modernization of production capacities and introduction of the latest technologies in wine production should be emphasized. Management of the vineyards has been improved by introducing new techniques for growing grapes and reducing the yield, in order to increase the quality of the grapes and thus the final product. No less important are the increased investments in marketing of products by Macedonian wineries, as well as following new trends in packaging, bottle closure and labeling. Another change that is more recent is the increased awareness of the wineries for specialized wine educations of their employees in order to improve the skills in all segments of operations.

Through consideration of these factors, we get a perception of how the Macedonian wine industry works, as well as the factors that can appear as an opportunity or threat for all involved parties in the wine business.

The most important competitors of the Macedonian wine are the countries of Southeast Europe and the countries that are newcomers on the global wine market. The primary competitors of Macedonian wines are Moldova, Georgia, Slovenia, Croatia, Bulgaria, Greece and Romania (WOM, 2015).

Macedonia has several unique selling propositions which can use for differentiation from other competitors. First is that it is a new country from the Old World or more precisely a country from the Old World with a new vision. As a wine country, Macedonia is at the same time very young and very old. Besides this advantage, Macedonia has a favorable microclimate and rich soil for growing grapes. No less significant are local varieties, due to the high concentration of resveratrol in the red wines and caftaric acid in the white wines. Macedonian wineries have modern wine processing facilities and they are oriented towards varietal labeling. Finally yet importantly, Macedonian wines continuously win awards and recognitions at international wine competitions (WOM, 2015).

Materials and methodology

In order to select target markets in the EU for Macedonian wines, desk research and market analysis were used. All available sources of information were taken into account: 1) information from Wines of Macedonia (WOM) association about export of Macedonian wines in EU countries; 2) vine and wine sector strategy from Ministry of Agriculture, Forestry and Water Economy (MAFWE); 3) information for the production and consumption of EU countries from Wine Institute; 4) interviews with export managers from Macedonian wineries; 5) data from Trade map for import of wine in EU countries.

Also, a valuable information were used from CBI Market Intelligence about trends in the wine industries of the target markets. This information was crucial for defining future activities on those markets.

Results

The paper analyzes seven criteria for selecting target markets in EU for Macedonian wines:

1. Export volumes of bulk wine from Macedonia to EU-28 (2016)
2. Export volumes of bottled wine from Macedonia to EU-28 (2016)
3. Per capita wine consumption in EU-28 (2014)
4. Wine production in the EU-28 (2015)
5. Import of bulk wine in EU-28 (2016)
6. Import of bottled wine in EU-28 (2016)
7. Import of bottled wine in EU-28 from the countries of South-East Europe (2016)

All EU-28 Member States are given points for each criterion in order to obtain the total number of points per country. Less importance is given to the bulk wine compared to

the bottled, because the goal is export of bottled wine. Therefore, criteria 1 and 5 are given less importance and scoring is done on a scale from one to five, and on the other criteria from six to ten points.

The first two criteria (Table 1) include data on export of Macedonian wine in 2016 and show the most important export markets in the EU. This criteria show the perspective of Macedonian wine in certain markets, as well as the importance of the markets especially for exporting bottled wine. That is why the highest points are given to the countries where Macedonia exports the most wine.

Table 1. Export of Macedonian bulk and bottled wine to the EU-28 in 2016[4]

Country	Criteria 1 – Bulk wine				Criteria 2 – Bottled wine			
	Volume (liters)	Value (euros)	Share in the total export of bulk wine in volume	Score (1-5)	Volume (liters)	Value (euros)	Share in the total export of bottled wine in volume	Score (6-10)
Austria	/	/	/	/	3,300	8,462	0%	6
Belgium	/	/	/	/	13,500	35,310	0%	6
Bulgaria	11,400	4,786	0%	1	491,100	499,557	4%	6
Croatia	5,532,600	3,838,198	25%	3	6,939,700	5,150,436	59%	9
Cyprus	/	/		/	2,900	2,064	0%	6
Czech Republic	503,000	248,996	2%	1	58,000	82,007	0%	6
Denmark	1,000	7,959	0%	1	17,900	133,995	0%	6
Estonia	/	/	/	/	/	/	/	/
Finland	/	/	/	/	/	/	/	/
France	/	/	/	/	2,500	9,609	0%	6
Germany	15,523,100	6,540,681	69%	5	589,000	804,330	5%	6
Greece	/	/	/	/	/	/	/	/
Hungary	/	/	/	/	1,300	9,978	0%	6
Ireland	/	/	/	/	/	/	/	/
Italy	/	/	/	/	38,900	94,457	0%	6
Slovakia	/	/	/	/	12,400	33,892	0%	6
Slovenia	588,500	336,619	3%	1	3,334,000	1,965,224	28%	8
Lithuania	5,500	4,801	0%	1	16,500	27,214	0%	6

4 The points are given in the following way:
Criteria 1 – Export of bulk wine from Macedonia to EU-28: 0-10% = 1 point; 10-20% = 2 points; 20-40% = 3 points; 40-60% = 4 points; 60-100% = 5 points;
Criteria 2 – Export of bulk wine from Macedonia to EU-28: 0-10% = 6 points; 10-20% = 7 points; 20-40% = 8 points; 40-60% = 9 points; 60-100% = 10 points

Country	Criteria 1 – Bulk wine				Criteria 2 – Bottled wine			
	Volume (liters)	Value (euros)	Share in the total export of bulk wine in volume	Score (1-5)	Volume (liters)	Value (euros)	Share in the total export of bottled wine in volume	Score (6-10)
Latvia	/	/	/	/	71,300	88,754	1%	6
Luxembourg	/	/	/	/	/	/	/	/
Netherlands	300	890	0%	1	62,000	146,456	1%	6
Poland	175,000	71,772	1%	1	134,000	106,499	1%	6
Portugal	/	/	/	/	/	/	/	/
Romania	98,700	46,679	0%	1	/	/	/	/
Spain	/	/	/	/	/	/	/	/
Sweden	/	/	/	/	21,800	58,050	0%	6
Malta	/	/	/	/	/	/	/	/
United Kingdom	/	/	/	/	51,500	92,506	0%	6
Total EU-28	22,439,100	11,101,381	100%		11,861,600	9,348,800	100%	

Source: WOM, 2017c

The third selection criteria reveal the most attractive markets in terms of wine per capita consumption. Therefore, high points are given to countries with relatively high per capita consumption, assuming that these countries have the capacity for bigger wine imports in order to meet the needs of consumers on the domestic market.

On the other hand, country production volumes helps us to determinate the most difficult markets to penetrate. Those are countries where production of wine highly exceeds (2-3 times) the domestic wine consumption, meaning that the wine industries of these countries are highly developed, producing all type of wine and fully satisfy the domestic demand. Such markets are serious hurdle for foreign competition and should be avoided. That is why countries that have lower production are given more points, and vice versa. Criteria 3 and 4 are covered in Table 2.

Table 2. Wine consumption per capita in the EU-28 in 2014 and wine production in EU-28 in 2015[5]

Country	Criteria 3		Criteria 4	
	Wine consumption per capita (liters)	Score (6-10)	Wine production (in million liters)	Score (6-10)
Austria	30.66	9	230.0	10
Belgium	23.07	8	3.0	10
Bulgaria	20.60	8	191.3	10
Croatia	44.20	10	168.0	10
Cyprus	14.94	7	10.8	10
Czech Republic	19.65	7	45.0	10
Denmark	14.05	7	/	10
Estonia	2.79	6	/	10
Finland	4.45	6	/	10
France	42.51	10	4,750.0	6
Germany	24.84	8	890.0	9
Greece	27.86	8	270.0	10
Hungary	24.10	8	290.0	10
Ireland	5.46	6	/	10
Italy	33.30	9	4,950.0	6
Slovakia	15.50	7	37.3	10
Slovenia	44.07	10	75.0	10
Lithuania	1.11	6	/	10
Latvia	3.19	6	/	10
Luxembourg	9.82	6	10.1	10
Netherlands	18.33	7	/	10
Poland	0.42	6	/	10
Portugal	41.74	10	670.0	9
Romania	24.26	8	350.0	10
Spain	21.26	8	3,720.0	6
Sweden	26.00	8	/	10
Malta	23.18	8	2.2	10
United Kingdom	21.99	8	/	10

Source: Wine Institute, 2015, 2017

5 The points are given in the following way:
Criteria 3 - 0-10 liters = 6 points; 10.1-20 liters = 7 points; 20.1-30 liters = 8 points; 30.1-40 liters = 9 points; 40.1-50 liters = 10 points.
Criteria 4 - In million liters: 0-500 = 10 points; 501-1.500 = 9 points; 1.501-2.500 = 8 points; 2.501-3.500 = 7 points; > 3.500 = 6 points

Criteria 5 and 6 relate to total wine imports (bulk and bottled) in the European Union in 2016 (please see below Table 3).

Table 3. Import of bulk and bottled wine in EU-28 in 2016[6]

Country	Criteria 5			Criteria 6		
	Import of bulk wine in 2016 (value in '000 euros)	Import of bulk wine in 2016 (volume in '000 liters)	Score (1-5)	Import of bottled wine in 2016 (value in '000 euros)	Import of bottled wine in 2016 (volume in '000 liters)	Score (6-10)
Austria	15,858	25,641	1	120,203	39,969	6
Belgium	97,838	84,110	1	576,768	172,447	7
Bulgaria	1,905	3,697	1	11,009	3,259	6
Croatia	10,210	18,335	1	13,992	11,363	6
Cyprus	771	954	1	16,164	6,782	6
Czech Republic	51,097	98,410	1	109,645	64,581	6
Denmark	94,786	77,690	1	423,039	89,729	6
Estonia	11,046	7,304	1	38,099	12,385	6
Finland	38,527	30,020	1	125,397	38,702	6
France	252,383	622,754	5	411,213	120,788	7
Germany	488,372	851,849	5	1,581,641	546,306	9
Greece	3,519	7,407	1	12,067	7,262	6
Hungary	6,001	14,398	1	7,489	3,846	6
Ireland	4,708	1,558	1	244,749	112,744	7
Italy	91,522	137,349	2	61,613	22,627	6
Slovakia	12,950	31,697	1	33,721	30,130	6
Slovenia	2,974	0	1	7,124	6,538	6
Lithuania	9,475	19,232	1	129,739	57,715	6
Latvia	1,968	1,512	1	45,443	20,388	6
Luxembourg	5,674	8,616	1	65,413	18,082	6
Netherlands	55,457	60,421	1	816,325	305,819	8
Poland	12,691	20,947	1	191,787	83,761	6
Portugal	51,997	127,479	2	30,391	40,309	6
Romania	14,617	35,459	1	19,911	10,996	6
Spain	13,709	25,213	1	69,095	22,667	6
Sweden	172,281	72,291	1	361,294	58,934	6
Malta	484	979	1	14,171	5,588	6
United Kingdom	485,314	482,107	4	2,395,177	799,431	10

Source: Trademap, 2017

6 Criteria 5 - 0-100.000 ('000 liters) = 1 point; 100.000-200.000 liters = 2 points; 200.000-400.000 liters = 3 points; 400.000-600.000 liters = 4 points; 600.000-1.000.000 liters = 5 points
Criteria 6 - 0-100.000 ('000 liters) = 6 points; 100.000-200.000 liters = 7 points; 200.000-400.000 liters = 8 points; 400.000-600.000 liters = 9 points; 600.000-1.000.000 liters = 10 points

For the import of bulk wine in EU-28 (criteria 5) scoring is done on a scale from 1 to 5, because this criteria is considered less relevant than import of bottled wines and it brings fewer points in the final selection. On the other hand, for import of bottled wine in EU-28 scoring is done on a scale from 6 to 10, because this criteria is considered more relevant than import of bulk wine.

In addition, the last criteria refers to the import of bottled wine into the EU from the countries of Southeastern Europe: Republic of Macedonia, Croatia, Bulgaria, Montenegro, Albania, Serbia, Slovenia, Bosnia and Herzegovina, Greece, Romania, Hungary, Moldova, Georgia and Armenia. The goal is to see the openness of EU countries to import wine from this group of countries, which includes Macedonia (Table 4).

Table 4. Import of bottled wine in EU-28 from Southeast Europe in 2016[7]

Country	Import of wine from Southeast Europe in 2016 (value in '000 euros)	Import of wine from Southeast Europe in 2016 (volume in '000 liters)	Average price of imported wine from Southeast Europe (EUR/LIT)	Scoring according to the importance of the country (6-10)
Austria	1,957	817	2.40	6
Belgium	3,331	1,346	2.47	6
Bulgaria	275	119	2.31	6
Croatia	8,359	9,519	0.88	9
Cyprus	5,326	1,826	2.92	6
Czech Republic	16,940	13,215	1.28	10
Denmark	600	149	4.03	6
Estonia	2,702	1,074	2.52	6
Finland	480	152	3.16	6
France	1,531	549	2.79	6
Germany	26,741	12,591	2.12	10
Greece	186	156	1.19	6
Hungary	477	218	2.19	6
Ireland	506	244	2.07	6
Italy	3,050	1,143	2.67	6
Slovakia	11,617	17,485	0.66	10
Slovenia	2,727	4,062	0.67	8

7 Criteria 7 - Scoring is done on a scale from 6 to 10. The points are given in the following way:
0-2.000 ('000 liters) = 6 points; 2.000-4.000 liters = 7 points; 4.000-6.000 liters = 8 points; 6.000-10.000 liters = 9 points; 10.000-20.000 liters = 10 points

Country	Import of wine from Southeast Europe in 2016 (value in '000 euros)	Import of wine from Southeast Europe in 2016 (volume in '000 liters)	Average price of imported wine from Southeast Europe (EUR/LIT)	Scoring according to the importance of the country (6-10)
Lithuania	2,967	1,438	2.06	6
Latvia	4,409	1,971	2.24	6
Luxembourg	92	39	2.36	6
Netherlands	3,673	1,671	2.20	6
Poland	27,003	16,380	1.65	10
Portugal	17	8	2.13	6
Romania	7,146	5,902	1.21	8
Spain	1,636	335	4.88	6
Sweden	1,236	379	3.26	6
Malta	4	2	0.00	6
United Kingdom	22,627	12,624	1.79	10

Source: Trade map, 2017

In the process of selection of target markets, the opinion of the Macedonian export managers is taken into consideration, given that they have the greatest knowledge about the difficulties in entering certain markets and the obstacles they face. Additional 10 points are given to the markets selected by the export managers (in Table 5). They are most familiar with the conditions of each market, demand, competition, importers, expected future growth, the possibility of penetration, as well as the desire of consumers to try new wines. Although certain markets have significant wine imports, they are really difficult to enter for countries that are new to the world wine market such as Macedonia.

Table 5. Overall evaluation of target markets for the Macedonian wines in EU

Country	Criteria							Points from the criteria	Opinion of Macedonian export managers	Total score
	1	2	3	4	5	6	7			
Austria	1	6	8	10	1	6	6	38		38
Belgium	1	6	8	10	1	7	6	39		39
Bulgaria	1	6	8	10	1	6	6	38		38
Croatia	3	10	10	10	1	6	9	49		49
Cyprus	1	6	7	10	1	6	6	37		37
Czech Republic	**1**	**6**	**7**	**10**	**1**	**6**	**10**	**41**	**10**	**51**
Denmark	1	6	7	10	1	6	6	37	10	47

Country	Criteria							Points from the criteria	Opinion of Macedonian export managers	Total score
	1	2	3	4	5	6	7			
Estonia	1	6	6	10	1	6	6	36		36
Finland	1	6	6	10	1	6	6	36		36
France	1	6	10	6	5	7	6	41		41
Germany	**5**	**6**	**8**	**9**	**5**	**9**	**10**	**52**	**10**	**62**
Greece	1	6	8	10	1	6	6	38		38
Hungary	1	6	8	10	1	6	6	38		38
Ireland	1	6	6	10	1	7	6	37		37
Italy	1	6	9	6	2	6	6	36		36
Slovakia	1	6	7	10	1	6	10	41		41
Slovenia	1	8	10	10	1	6	8	44		44
Lithuania	1	6	6	10	1	6	6	36		36
Latvia	1	6	6	10	1	6	6	36		36
Luxembourg	1	6	6	10	1	6	6	36		36
Netherlands	1	6	7	10	1	8	6	39	10	49
Poland	**1**	**6**	**6**	**10**	**1**	**6**	**10**	**40**	**10**	**50**
Portugal	1	6	10	9	2	6	6	40		40
Romania	1	6	8	10	1	6	8	40		40
Spain	1	6	8	6	1	6	6	34		34
Sweden	1	6	8	10	1	6	6	38		38
Malta	1	6	8	10	1	6	6	38		38
United Kingdom	**1**	**6**	**8**	**10**	**4**	**10**	**10**	**49**	**10**	**59**

Source: Authors' evaluation

Results and discussions

According to the previously mentioned criteria, 5 (five) countries were selected as target markets for Macedonian wines:

1. **Germany** is the largest export market for Macedonian bulk wine (WOM, 2017c). On this market, Macedonia is perceived as a producer of cheap low-quality wines. Germans prefer imported red wines and do not tax the wine as a product, only sparkling wines (Lieberz, 2015; CBI Market Intelligence, 2016a). However, due to the current low prices of Macedonian wineries on the market, they will not be able to drastically increase export prices in the near future (WOM, 2017d). Initially, promotional activities in Germany should be directed to B2B contacts in order to change the perception of German importers for the value of Macedonian wines. Sales in Germany should be directed to the northern

part of the country, given that in the southern part a satisfactory level of local production is achieved (CBI Market Intelligence, 2016b).

2. **The Netherlands** is one of the countries where Macedonia has the lowest export of bulk and bottled wine, but is open to importing wine from the countries of Southeast Europe. Wine taxes are continuously growing, and on the other hand, the Dutch are price sensitive and tend to purchase in stores at lower prices (CBI Market Intelligence, 2016c). Therefore, it is best to taka as a benchmark the prices of the competitive wines on the market. In the Netherlands, there is almost no domestic production, and this is not expected to change in the near future (CBI Market Intelligence, 2016d). The focus should be placed on public relations, presence of significant regional fairs and manifestations and communication with target groups: Dutch tourists who visit Macedonia, wine experts. In terms of distribution, the focus should be placed on supermarkets, as consumers usually buy wine there.

3. **Poland** is a market that has not been given special attention so far, and has great potential for increasing exports. Although this wine market is one of the least developed within the EU, wine sales are experiencing a boom (CBI Market Intelligence, 2016e). Polish consumers are much more familiar with Macedonian wines because of the geographical closeness with Macedonia. An additional advantage is the preference of red wines from Polish consumers, and it is an opportunity for Macedonian wineries to promote the autochthonous Vranec variety. Due to the low standard of life in this country, as well as the undeveloped wine culture, it is not recommended to increase export prices, but to use prices for initial entry on the market. At the same time, Macedonian wineries need to work on educating consumers about wine, highlighting its positive aspects, organizing tastings and BTL-promotions, as well as taking part in regional festivals and fairs. It is recommended direct export for off-trade, and indirect in on-trade. In both cases, it's necessary to pay attention on education of the management teams in the markets and restaurants, as well as organizing a visit to the Macedonian wineries.

4. **Denmark** has a highly fragmented wine market and has the highest average number of wine importers per capita, which means that there is intense competition on the market (Meininger's WBI, 2013). More recently, the Danes are increasingly oriented towards the consumption of wines from traditional European countries, and are more reserved for the countries of the New World (CBI Market Intelligence, 2016f). In 2016, Macedonia made very little export of bottled wines in this country, and in the same year, it did not export any bulk wine. Consumers follow fashion trends in the wine industry and they are increasingly oriented towards environmentally friendly products. For Macedonian wines it is positive that local wine production is insignificant, and negative that taxation in Denmark is quite high (CBI Market Intelligence, 2016f). Despite this, in 2016, Macedonian wines achieved a high average

export price in Denmark and it is recommended to use the strategy of price matching with the competition (WOM, 2017d). Activities in this market should be focused on BTL activities and organizing events, visits and tastings, as well as presenting Macedonia as a wine country. In distribution, the focus should be placed on on-trade which is expected to grow in the future, although now is a small segment of the market.

5. **The Czech Republic** is a market that, due to its geographical closeness with Macedonia, provides better acquaintance of Czech consumers with Macedonian wines. Although the symbol of this country is beer, wine has gained great popularity in recent years. Most of the wine is imported from EU member countries (CBI Market Intelligence, 2016g). In 2016 bottled Macedonian wine has very little participation in the total exports in the Czech Republic, therefore Macedonian wineries need to use a strategy of repositioning the existing products. Taxation is much lower than other developed wine markets in the EU, which contributes to achieving lower prices (CBI Market Intelligence, 2016g). The export prices on this market should not be increased given the lower purchasing power of Czech consumers (CBI Market Intelligence, 2016h). In this country there are minimal restrictions on the promotion of wine in the media and this allows to use ATL advertising in specialized wine media (CBI Market Intelligence, 2016g). Another way to promote is by educating Czech consumers about wine as a product. The distribution can be directed both to off-trade (indirectly through importers) or specialized stores that sell premium wines.

Conclusions

Studies that analyze the decision-making process by consumers when purchasing wine constantly indicate that in the wide range of brands on the shelf, the origin of the brand plays the role of qualitative differentiation. For this reason, it is of crucial importance for Macedonia to focus on strengthening the image of the country and increasing the export of high quality wines in the premium segment. Hence, the possibility of increasing exports depends primarily on the success of positioning and strengthening not only the image of the country, but also the brand "Wines of Macedonia".

One of the key challenges facing the Macedonian wine industry when it comes to foreign markets is the general unrecognizability of Macedonia as a wine country. It is necessary to invest serious efforts and funds for image building and for the promotion of the Republic of Macedonia as a producer of quality wine and for overcoming the perception as a county producing bulk wines. That's why using the common wine brand is of particular importance with targeted and joint promotions and appearance of the wineries to the foreign markets.

In recent years the ratio between bulk and bottled wine started to change positively in terms of bottled wine.

The European Union is not only the biggest producer, consumer and trader of wine in the world, it is also the most important export market for Macedonian wines. But there are differences in the wine market development of the EU Members and the behavior and lifestyle of consumers are also different. Therefore, a selection of five markets (countries) that offer the greatest opportunities for the Macedonian wineries is done: Germany, the Netherlands, Poland, Denmark and the Czech Republic.

Only with the joint appearance of the wineries, creating a common brand and a defined national strategy for target markets, Republic of Macedonia can expect an increase in EU imports of wine. Otherwise, the individual success of certain wineries on certain markets will be valorization only for their commercial achievements.

Conflict of interests

The authors declare no conflict of interest.

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RENEWABLE ENERGY RESOURCES IN AGRICULTURE: POTENTIAL AND LEGAL FRAMEWORK IN THE REPUBLIC OF SERBIA

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ABSTRACT

The disappearance of natural resources, development of environmental awareness and need to rationalize their spending, and in order to reduce the cost of energy production, caused an increasing need for the development and use of renewable energy sources (RES).Larger use of RES would provide energy security and lower energy imports.Of all forms of RES in R. Serbia, the biomass energy potential comes first.There has been considered legal framework relevant to the use of RES at the European level and within the boundaries of the R. Serbia. The authors point to the need for further harmonization of domestic legislation with global and European trends in the field of RES, as well as obligations from ratified international documents and the European integration process.The article also shows the potential of RES in agriculture as well as the actual state of exploitability in R. Serbia. Increasing the use of RES in R. Serbia can help diversify Serbian's energy supply, create growth and jobs, and lower greenhouse gas emissions.

Introduction

The climate change will significantly determine energy policy in the world in the course of the 21st century. Protection of global climate, valuable sources saving and feasible development in the whole world are important challenges which must be overcome in this century (IEA, 2015). Fossil fuel reserves are limited. Statistical reserves of oil are

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calculated to be sufficient for some 30 years more, gas reserves for about 60 years and coal reserves for about 200 years more (Pekez et al., 2016). The increase in the price of fossil fuels, emissions of carbon dioxide and other gases that cause the greenhouse effect and climate changes will make people reduce the energy consumption.

RES is a promising alternative solution because it is clean and environmentally safe. It also produces lower or negligible levels of greenhouse gases and other pollutants when compared with the fossil energy sources they replace (Demirbas, 2009). Promoting innovative renewable applications and reinforcing the renewable energy market will contribute to the preservation of the ecosystem by reducing emissions at local and global levels (Abdeen, 2008).The technically usable energy potential of the RES in R. Serbia is very important and has been estimated to over 4.3 Mtoe per year, which makes about 20% of the total primary energy consumption (Pekez et al., 2016). R. Serbia is considered to have the potential to produce 4.89 Mtoe from RES. Renewable energy has the potential to play an important role in providing energy with sustainability to the vast population in developing countries which still have no access to clean energy (Painuly, 2001).

In order to implement the green economy, it is important that the citizens are aware of the environment, but also the laws that the country's government will adopt to support the development of the concept of the green economy (Hanić, Baranenko, 2014). Around the world, a growing number of nations have recognized the economic, social, and environmental benefits of renewable energy, and are enacting tax incentives and other policy measures favorable to renewable technologies (Liu et al., 2009).Projections are important tools for long-term planning and policy settings (Demirbas, 2009).

Getting energy from agriculture is not a negligible factor in the struggle for the energy stability of each state, and besides food production, this economic activity could become the main producer of energy from renewable sources (Roljević, Hamović, 2010). The largest share of the RES in our country has biomass, and it accounts for 61% of the total RES potential. According to statistical data, using the available RES potentials, the need for non-renewable sources would be reduced by about 45%, and import dependency by about 20%.

Given that the R. Serbia achieves as much as 20% of the social product from the agroindustry, while agricultural production participates in the creation of GDP with 12%, there is a need to direct agriculture towards the production of RES (Roljević, Hamović, 2010). With the transition of agricultural holdings to the production of RES, it would encourage the development of rural economy, provide energy needs, and thus reduce import dependency. RES as a significant potential of the agrarian sector should be used in the direction of development of rural environments, as well as reduction of dependence on fossil fuels.

Renewable energy sources in agriculture

As already mentioned, technically usable energy potential of RES in R. Serbia is large and it is estimated at over 4.3 Mtoe per year - of which about 2.7 Mtoe per year is in the

biomass utilization, 0.6 Mtoe per year in unused hydro-potential, 0.2 Mtoe per year in existing geothermal sources, 0.2 Mtoe per year in wind energy and 0.6 Mtoe per year in the exploitation of solar energy. The development and scope of the use of RES in agriculture in R. Serbia are determined by the following factors:

- Geographical position;
- Natural resources (climate, pedological and hydrological characteristics);
- The technical and technological degree of social development;
- Educational level and environmental awareness of people;
- Economic abilities of the state;
- Financial possibilities of family farms;
- Administrative and legal regulations in the field of RES use;
- Long-term global and European rural development strategies and the fight against the negative effects of climate change.

1) Wind Energy. R. Serbia has all the potentials for exploiting wind energy. The most promising locations in R. Serbia for the construction of wind power plants based on wind speed are: Midžor on Stara Planina with average wind speed of 7.66m / s, Suva Planina 6.46m / s, Vršački Breg 6.27m / s, Tupižnica 6.25m / s, Krepoljin 6.18m / s, Deli Jovan 6.13m / s, Juhori Jastrebac, but also other areas in the Danube, Sava and Morava valley should not be omitted.

The prescribed quotas of the Government of the Republic of Serbia for the wind power plant by 2020 amount to 500 MW. Considering the maximum possible production of wind farms with this installed power, they can count on their maximum technically usable potential of 1,200 GWh / year (0,103 Mtoe / year). The incentive fixed feed-in tariffs for wind farms amount to 9.2 eurocent / kWh, with a guaranteed 12-year power takeover period. In R. Serbia, as much as 70% of the total production of wind energy is produced in the winter months when the country imports most and when the import of electricity is the most expensive.

The first wind farms in R. Serbia were built in the last decade. However, the construction of large wind farms in R. Serbia obviously belongs to the future. During the period 2008-2018, the total installed capacity of preferential generators was 17.0 MW, and wind farms acquired the status of temporary preferential generators with a total capacity of 514 MW (according to the data of the Ministry of Mining and Energy of Republic of Serbia (MMERS, 2018). Further work on improving the existing solutions needs to be done by taking into account the new results of wind energy measurement and more precise digital maps in R. Serbia.

2) Hydro energy. R.Serbia has significant hydro potential that is estimated at 25 TWh per year, of which 17.5 TWh is identified annually as economically viable for use. Almost 10 TWh are already being used, mainly through large hydroelectric power plants (according to the data of Chamber of Commerce of Serbia. (CCS, 2018).

Small hydropower plants have energy facilities of up to 10 MW and fall into the category of privileged energy producers. The energy potential of watercourses and locations for the construction of small hydroelectric power plants was determined by the document *Cadastre of Small Hydroelectric Power Plants on the territory of SR Serbia outside SAP* from 1987. Unused hydropower potential is mostly on smaller rivers.In about 900 potential locations on the rivers in R. Serbia, including small rivers, the building of small hydroelectric power plants (up to 10 MW) has been established with possible production of about 1,800 GWh per year.

3) Geothermal energy. Geothermal energy is used only in some reservoirs and agricultural enterprises. This is a legally underdeveloped area with old and energy-inefficient equipment, but for which there is a private initiative (CCS, 2018).

R. Serbia has a rich geothermal potential that is very poorly used. The geothermal potential of the R. Serbia represents a large number of spas and natural springs with water temperatures greater than 30°C, and a different degree of natural diversity. In R. Serbia, geothermal areas are mostly developed in Vojvodina, with the highest temperature of Vranjska, Jošanička and Sijerinska spas (Despotović et al., 2016).The potential of existing drill holes in R. Serbia (without using thermal pumps) is 0.17 Mtoe. There are more than 50 sources of the capacity that exceeds 1 MW. There are natural and artificial thermal water sources in R. Serbia in more than 60 municipalities. The temperature of the water most frequently rises to 40 ºC and in the territory of six municipalities, it is over 60ºC.

4) Sun energy. Sun energy represents the energy potential of the R. Serbia which can be used for the production of heat or electricity; however, the solar potential is unused. On most of the territory of the R. Serbia, the number of hours of solar radiation is significantly higher than in many European countries (between 1,500 and 2,200 hours per year), but the use of this energy is still far behind EU countries.[4] The average intensity of the solar radiation in the territory of the R. Serbia ranges from 1.1 kWh/m2 per day in the north to 1.7 kWh/m2 per day in the south during January, and from 5.9 to 6.6 kWh/m2 per day during July. Yearly average value of global radiation energy for the territory of the R. Serbia is 1,200 kWh/m2 in northwest Serbia and 1,550 kWh/m2 in southeast Serbia, while in its central part it is about 1,400 kWh/m2 per year (ESDSRS, 2015).

Because of the geographical position of the R. Serbia and moderate continental climate in our country, which means relatively sharp winters with average temperatures during the coldest winter months are often lower than 0°C and relatively high demands for thermal energy just in the period when the sun's radiation is weakest it is possible to use solar heating systems (SGS) as basic, but only as an additional heating system. Analyzes have shown that optimally designed SGS for the territory of the R. Serbia should satisfy only 10-20% of the demand for thermal energy for space heating (System technology for solar thermal", Technical information 897600 RS, Rehau Solect, April, 2010).

4 The energy that the sun emits on the 1 m² roof of the house in R. Serbia during the year is equal to the energy generated by the combustion of 130 liters of oil - and it is free (Despotović et al., 2016).

This small percentage of satisfying the heating needs has determined their second and foremost role, both in R. Serbia and in the world for the heating of consumable water. Also, due to the existing legal regulations, as well as the geographical position of the R. Serbia and the moderate continental climate that governs this area, it can be concluded that the construction and exploitation of small and medium-sized SGS is the optimal choice for investors (Jefferson Instiute, 2009).

5) Biomass. Biomass represents a significant energy potential of the R. Serbia from agriculture and forestry. Today, annual biomass production in R. Serbia amounts to about 12.5 million tons (2.90 Mtoe) - 1.56 Mtoe is agricultural biomass and 1.34 Mtoe makes forest biomass. R. Serbia, and especially its northern region Vojvodina has a relatively big potential of biomass which is produced as a surplus in primary agricultural production (Tolmac et al., 2016). However, the CCS considers that the biggest obstacles to the increased use of biomass are mainly used as straws in stables, while private farms often burn the biomass in the fields (CCS, 2018) The market for the sale of biomass products in R. Serbia is poorly developed or does not exist and the fragmentation of the property is increasing the collection and transport costs of biomass. The use of biomass is mainly based on the remains of agriculture and forestry. Although the biomass potential is available throughout the territory of the R. Serbia, however, wood biomass is mostly located in central Serbia and agricultural biomass in the area of Vojvodina. However, while the degree of utilization of wood (forest) biomass potential is relatively high (66.7%), the potential of agricultural biomass is slightly used (~ 2%), while the potential of biodegradable municipal waste is not used at all (ESDSRS, 2015).However, in theory, biomass is increasingly considered to be among the rest of the RES due to the fact that it is sufficiently similar to fossil fuels and that they can be directly replaced. According to some estimates, if the rapeseed were grown on 150,000 hectares, the production on these areas would be sufficient to produce about 100,000 tons of biodiesel (Ilić et al., 2004).

The largest share in the RES in our country has a biomass which represents a degradable part of products, that is residues and waste from agriculture, forestry and wood industry, whether they are plant or animal origin, whereby their energy use is permitted only in accordance with the regulations governing issues of environmental protection (Roljević, Hamović,2010). Large quantities of biomass originate from agriculture, cultivation of cereals, industrial and fodder plants, then from residues of fruit tree crops, as well as farm residues.[5] For example, about 10 to 12 kg of liquid manure with 4 to 10% dry matter is needed to obtain 1 m3 of biogas (Furman et al., 2007).Of all RES forms, the biomass energy potential is at the forefront. The biomass potential is very large and very widespread throughout the world. Today, biomass is a major source of global energy needs, and it reaches 12% (50 EJ / year) of global demand (406 EJ / year) (Despotović et al., 2016).

5 With fruit trees, every season, a large number of plant residues 1-2 t / ha are obtained, which are most often burned, or rarely shed. A similar situation is in viticulture, where every year about 1 t / ha of residue remains (Roljević, Hamović,2010).

R. Serbia has very favorable conditions for the cultivation of oil plants, above all sunflower, soybean, and rapeseed whose seeds are abundant with the oils needed for the production of biodiesel. Facilities for the production of electricity and heat from biomass, as well as biodiesel and bioethanol, have been tested abroad for good practice and the future, using the potential of local agriculture and industry (Tešić et al., 2010).

Implementing bioenergy plants have positive impacts on rural development by creating direct employment and by supporting related industries and employment there. Jobs are created all along the chain, from biomass collection in the forest or energy crops grown by farmers to transport, conversion technology providers, installers and service providers, marketing, etc (Kaygusuz et al., 2007).

The legal framework in the European Union

The European Union (EU) has set itself ambitious goals when it comes to the use of RES and the fight against climate change. It is estimated that the EU is currently the world leader in investing in RES, especially in the development of wind and solar energy. At the end of 2014, 128.8 GW of total wind capacity (120.6 GW onshore and 8 GW at sea) was produced in the EU, which is average 284 TWh annually - enough to cover 10.2% of electricity consumption in the EU (EWEA, 2015). The European Commission's 2005 Biomass Action Plan (2005) stressed that support for the development of RES, such as biomass, is very important for the development of rural areas.

The EU integrates climate and energy issues through the *EU Climate and Energy Package 2020,* which includes a set of binding legal documents. The *20-20-20* targets set three key targets for the EU by 2020: reducing greenhouse gas emissions by 20% compared to 1990 levels; increasing the share of energy consumption from RES to 20%; and increasing energy efficiency by 20%. These goals represent an integrated approach to climate and energy policies aimed at combating climate change, increasing EU energy security, strengthening its competitiveness and ensuring efficient use of energy. The *EU Climate and Energy Package* consists of four legislative acts:

- The EU Emission Trading System-ETS system is a means to reduce greenhouse gas emissions from the industrial sector in an economically efficient way, and is currently in the third trading period for the period 2013-2020. The climate and energy package includes a comprehensive revision and strengthening of the legislation underlying the EU ETS system i.e. the EU Emissions Trading Directive. The changes include the introduction of a unique EU-wide emission limit instead of previous national restrictions. This limit will be reduced each year so that by 2020, emissions are 21% below the 2005 level.
- Under the Decision on Joint Efforts, Member States have undertaken binding annual targets for reducing their greenhouse gas emissions from sectors not covered by the EU ETS, such as *agriculture,* housing, waste, and transport - accounting for around 60% of the total emissions in the EU.

- EU Member States have undertaken binding national targets to increase the share of RES in their total energy consumption by 2020.[6] Directive 2009/28 / EC provides that, by 2020 RES shall account for at least 20% of the total energy consumption in the EU. This Directive also provides that, by 2020 the use of renewable energy in transport (biofuel, electricity, and hydrogen produced from RES) amounts to at least 20% of the total fuel consumption in the EU.
- The fourth element of the climate and energy package is a directive that creates a legal framework for the environmentally sound application of carbon capture and storage.

The climate-energy package does not deal directly with energy efficiency targets. This goal is accomplished through Energy Efficiency Plan (2011).

Biofuels and bioliquids are instrumental in helping EU countries meet their 10% renewables target in transport. The Renewable Energy Directive 2009/28/EC sets out biofuels sustainability criteria for all biofuels produced or consumed in the EU to ensure that they are produced in a sustainable and environmentally friendly manner.[7] Biofuel concuption has increased nine-fold over 15 years and by 2030, 60% of RES willbe supplied from biofuels and will be used in all sectors (Bozma, Akda, 2018).

The EU has set goals for 2030 that are even more ambitious and demanding than the 2020 targets. This framework aims to build a competitive and secure energy system that should provide affordable energy for all consumers, increase the energy security of EU energy, reduce dependence on energy imports and provide new opportunities for development and employment. (EC,2017). The 2030 Framework for Climate & Energy sets three key targets for the year 2030. The first key objective is the obligation to reduce greenhouse gas emissions for 2030, at the EU level by at least 40% below the level of 1990.[8]The European Council has adopted an obligation to increase the share of RES by at least 27% in total energy consumption at the EU level by 2030, which is the second key objective. The third goal is to increase energy efficiency by at least 27%.

6 These targets reflect different Member States' starting points and the potential for increasing RES outputs ranged from 10% in Malta to 49% in Sweden. According to the available estimates, with regard to the increase in the final energy consumption from RES, the EU will achieve 21% and in this case exceed its 2020 target (the achieved level of RES use ranges from 0.3% in Malta to 52.4% in Sweden (where the national target is exceeded).

7 The European Commission has issued non-binding recommendations on sustainability criteria for biomass. Related documents on Sustainability criteria: Report on sustainability requirements for the use of solid and gaseous biomass sources in electricity, heating and cooling [COM/2010/11]; Impact Assessment [SEC/2010/65] and Summary of the Impact Assessment [SEC/2010/66].

8 In order to achieve the 40% target, the sectors that fall under the EU ETS system should reduce emissions by 43% compared to 2005. Emissions from non-EU sectors. The ETS should reduce emissions by 30% below 2005 levels.

The Roadmap by 2050 is a set of policy plans that should enable sustainable use of resources at the EU level. The Roadmap suggests that by the year 2050, the EU at the national level should reduce emissions by 80% compared to 1990 levels.To make the transition, the EU would need to invest an additional €270 billion (or on average 1.5% of its GDP annually) over the next 4 decades (EC, 2017).

Treaty on establishing the Energy Community

R. Serbia has ratified the Treaty on establishing the Energy Community between the European Community and the Albania, Bulgaria, Bosnia and Herzegovina, Croatia, FYR Macedonia, Montenegro, Romania, Serbia and the United Nations Interim Mission Kosovo in accordance with UN Security Council Resolution 1244,2006 "Official Gazette of the R. Serbia, No. 62/2006"). However, in December 2009, the Council of Ministers of the Energy Community decided to join Moldova and Ukraine, thus abolishing the geographical concept of the Western Balkans, for which the process was initially tied. The main task of the Energy Community is to establish cooperation between the signatory countries and to create a stable regulatory and market framework attractive for new investments in transit and transport electricity infrastructure and in the production of energy.

The main objective of the Treaty establishing the Energy Community is to harmonize the energy policies of non-EU countries with the EU's energy policy. The Energy Community allows the transfer of essential energy *acquis communautaire,* assistance in the development of an adequate regulatory framework and liberalization of the energy markets of the parties in accordance with the *acquis.* An important element is also the implementation of the EU 20-20-20 targets by signatories to the Treaty establishing the Energy Community, although they are not part of the EU. The goal of forming the Energy Community is to create a single energy market, increase energy efficiency and the degree of use of RES.

The energy strategy of the Energy Community is based on the same principles as the EU Energy Strategy, setting priorities and goals for the energy sector: creating an energy market with competitive prices, ensuring energy security, reducing CO2 emissions, and saving energy. The first objective is to establish a competitive integrated energy market between the contracting parties and its integration with the EU energy market. The second strategic objective is to attract investments in the energy sector, and the third strategic goal is to secure and sustainably supply electricity to customers.

The Ministerial Council of the Energy Community in 2012 adopted Directive 2009/28/EC and set national targets for RES according to which nine contracting parties are obliged to achieve by 2020. Thus, the Energy Community of R. Serbia has set a mandatory goal to increase the share of RES in total gross energy consumption, starting from 21.2% in 2009 to 27% by 2020. In the electricity sector, 1,092 MW of new RES generation capacities is required by 2020. However, with regard to the implementation of Directive 2009/28/ EC, most of the Contracting Parties of the Energy Community will not be able to fully comply with and implement the *acquis* on time.

However, the use of RES in the R. Serbia is far below the expected results that the R. Serbia, as a Contracting Party of the Energy Community, committed. This result is not a consequence of the lack of potential, nor of the lack of investors, but of a large number of different economic, political and social obstacles that are on the road to the construction of RES projects, especially large ones. Therefore, the obstacles that arise are legal and regulatory barriers; institutional and administrative barriers; financial and investment barriers; barriers to capacity and infrastructure; limited public awareness and public acceptance of RES.

The legal framework in the Republic of Serbia

R. Serbia signeda *Stabilisation and Association Agreement between the European Community and their Member States on the one side and Serbia*, on the other side ("Official Gazette of RS – International agreements 83/08"). In this way, it aligns its legal system with EU *acquis communautaire* acquis in order to achieve the goals of the EU in the field of RES, fulfill its international obligations and provide a better energy future. However, this will be possible if the regulatory framework and other investment conditions encourage continuous investment in this area.

A new Law on Energy ("Official Gazette of the R. Serbia, No. 145/2014") was adopted in the Republic of Serbia (LE, 2015), a new Energy Sector Development Strategy of the Republic of Serbia for the period by 2025 with projections by 2030 (ESDSRS, 2015) ("Official Gazette of the R. Serbia, No. 101/2015") and National Action Plan for Renewable Energy Sources (NAPRES, 2013)

- Making of NAPRES (2013) came from an international obligation that the R. Serbia took over the Treaty establishing the Energy Community. In NAPRES as a framework for the promotion of energy produced from RES in R. Serbia, mandatory national targets for RES energy participation in gross final energy consumption (27%), as well as the share of energy from RES in transport (10%) by 2020, are set. In this way, R. Serbia joined the countries that subsidized electricity generation from the RES and introduced the most widespread model - incentive fixed feed-in tariffs.
- ESDSRS (2015) sets a framework aimed at facilitating investment and promoting energy security at the national and regional levels.
- LE (2015) has largely implemented the Third EU Energy Package, and set targets for energy policy, reliable, high-quality and safe energy and energy supplies; goals for the use of RES; conditions and incentives for RES production. LE made positive changes in the following areas: Introduction of a single Electricity Purchase Agreement; The deadline for completion of the project is extended to three years (instead of two); A clause *vis maior* was defined during construction; The manner of obtaining licenses and construction, as well as the obligations related to the connection of energy facilities (overhead lines and substations) that are financed and potentially built by private investors were defined, but are

owned by the state transmission system operator that manages them. And the LE fees on issues of authorization and tenders for the construction of new production capacities are harmonized with the *acquis*. (ECS, 2015)

- The Law on Planning and Construction ("Official Gazette of the R. Serbia, No. 72/2009, 81/2009 - exp., 64/2010 - decision US, 24/2011, 121/2012, 42/2013 - decision US, 50/2013 - decision US, 98/2013 - decision US, 132/2014 and 145/2014"), which simplifies the process of obtaining building permits, was adopted by the Assembly of the Republic of Serbia in December 2014.
- Regulations that represent the legal framework for further development and implementation of energy projects from the RES are: Decree on the Requirements and Procedure for Acquiring the Status of a Privileged Producer, Preliminary Privileged Producer and Producer from RES („Official Gazette of R. Serbia 56/2016"); Decree on the Conditions and Procedure for Obtaining the Status of Privileged Electricity Producer, Temporary Privileged Producer and Producer of Electricity from RES, („Official Gazette of R. Serbia, 56/2016") and Decree on Power Purchase Agreement („Official Gazette of R. Serbia, 56/2016").
- In the Republic of Serbia was adopted: (a) Report on the implementation of the National Action Plan for the Use of Renewable Energy Sources, MMERS, "Official Gazette of RS", no. 8/15; (b) Report on the implementation of the National Action Plan for the Use of Renewable Energy Sources of the Republic of Serbia, 2016, MMERS.

The Energy Agency of the Republic of Serbia is responsible for issuing and revoking the license for performing the activity of electricity generation and combined generation of electricity and heat from the RES. In further legislative activities, it is necessary to assess the possibility of rationalizing procedures for obtaining licenses and permits, as they are often long and sometimes contradictory.

The Republic of Serbia is a member and founder of the International Renewable Energy Agency (IRENA) whose main goal is to become the main driving force in the accelerated transition towards the widespread and sustainable use of RES, and its main activities include: providing concrete advisory services to governments industrialized for RES policy, transfer technology and consulting services related to project financing, construction, and production capacity in the field of RES use.

However, each of the RES has its own specific environmental impact, which must be carefully analyzed in order to avoid harmful consequences. Thus, investors must strictly adhere to the standards in the construction of the wind farm, taking particular account of the distance of the wind farm from populated areas, and in the domain of impact studies on bird and bird habitats.

Conclusions

With the strengthening of ecological awareness of the disappearance of natural resources, and the rationalization of their spending, and in order to reduce the cost of energy production, there is an increasing need for development and use of RES, striving for a green growth of the economy. The RES will contribute to the energy security of the R. Serbia and countries in the region, and will significantly reduce winter imports of electricity and energy. The need for diversification of energy sources became apparent more than ever in May and June 2014, when the region hit the worst floods ever.

R. Serbia has established important components of the institutional and legal framework in this area. At the same time, there is still a need for their improvement, but above all by the implementation. The Government of the Republic of Serbia has developed a strategy to align its legislation and energy policy with the Directive 2009/28/EC, in an effort to fulfill international obligations. What is needed is to integrate the legal and political framework for the period up to 2030, which would provide regulatory security for investors and a coordinated regional approach. In order to encourage development and investments in this sector and fulfill the obligation under the Energy Community Treaty, the Government of the Republic of Serbia has adopted several regulations in accordance with Directive 2009/28 / EC, including: establishing a system of »incentive tariffs« in which the Government of the R. Serbia subsidizes the consumption of renewable electricity; defined requirements for acquiring the status of »privileged electricity producer« that uses RES for electricity generation.

Increased use of RES in agriculture for energy production will lead to the creation of new opportunities for production, placement and income in agriculture and forestry, as well as the development of the machinery industry and investment equipment, the opening of new jobs, primarily in small and medium enterprises and development companies. Therefore, staffing capacity, financial resources, as well as public sensitivity are essential for the need for RES development. Further use of RES will also be an investment in new jobs, as well as environmental protection as one of the key requirements for the EU accession.

International trends show that demand for energy is moving towards higher demand for cleaner fuels, so RES is a development and export opportunity, as natural resources allow it. In order for these resources to be available for energy generation, infrastructure construction, as well as diversification and adaptation of agricultural production and support to rural development, is necessary. The aim is to develop innovative ways of production, improve infrastructure and create new employment opportunities, so the potential of the RES derived from agriculture must be directed towards the development of agriculture and villages.

Conflict of interests

The authors declare no conflict of interest.

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AGRO-ECONOMIC DEVELOPMENT BASED ON THE ECONOMY OF KNOWLEDGE, BUSINESS AND SOCIAL SKILLS

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A B S T R A C T

In this paper, we tried to point out the contemporary global trends of agrarian development that generate new knowledge, a new way of learning, new innovative and creative techniques of professional training - business and social skills. Intention is to provide support and encouragement to enter new forms of agrarian business. Since education, as a dominant need for agrarian research, is in the function of labor or occupation, we wanted to provide an insight into the educational needs required for professional education and training, as well as how much the content of work in the agrarian defines educational needs and expresses interest in vocational education and training, by affirming practice through the realm of work and business results.

Introduction

Long-standing economic and transition crisis and social problems expressed by structural imbalance and poverty serve to fuel fresh thoughts and knowledge having the scientific importance in terms of responsible and active adaptation of agrarian changes processes based on global knowledge and skills.

Contemporary global agrarian trends generate new knowledge that requires new ways of learning, modern success formula and new innovative and creative techniques. Knowledge is the main driver of change and those values. Winners are those who are able to bring in the necessary changes, bring ideas, energy, the passion of creation, innovators, entrepreneurial drive, and all this requires knowledge and a positive attitude towards the work

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The forementioned implies a correct attitude towards education, reflected in the influence on establishing a positive attitude and the impact on the deepening of interest in knowledge based on one's own determination and needs.

"The Global passport" is provided only to educated innovative staff thinking differently, crush the old concepts and offer new innovative ideas.

As Dositej Obradovic, a great philosopher and educator once said, "We need a school of knowing life and people, an active school of a reasonable man, work and learning, which provides the necessary experience". Nothing has changed until now.

Success is a group of values shown. To succeed, it is important to have a choice, let the future happen. Great goals are seen only by big players

Great success is a triumph of perseverance and knowledge (Sigmund Freud)

The success formula – knowledge and skills equals success in agriculture

Agriculture as the pillar of the economic development of the Republic of Serbia has an invaluable social significance (multiplier effect on overall economic growth and development) and impact on social stability.

Increased transitional contradictions in agriculture and interest matrix are a consequence of the agrarian system and structural crisis are found at a complex crossroads and numerous problems of agrarian development. No fundamental relationship was present to the content and forms of transition in which agrarization with the development of entrepreneurship should have been the key to Serbian economic growth and development.

For the agrarian development, creative power of knowledge and intellectual potential is vital - education as a process of acquiring knowledge, building skills, adopting a system of values, new technologies, business and organizational culture.

The economy of knowledge is the main tool in creating a new model of economic and social growth and development. (Pejanovic, 2013, p. 613) Modern agrarian development requires changes of institutional basis, creative modernization in terms of production, technology, changes in the labor organization and management and strong development of production forces and their applicative ability, as well as appropriate incentives.

Knowledge, production and innovations are the most important sources of change and represent the basis for the construction of a modern agrarian system based on business knowledge and social skills. EU Member States have introduced a new concept of agro-economic development - professional training that encourages people who deal with agrarian delicacy, primarily in rural areas, to enter new forms of agrarian business, to introduce modern technologies in production, environmental protection culture and other.

That's how economy of knowledge is created both in theory and in practice, and in terms of production, it is called a knowledge-based economy (Pejanović, 2013, p.620).

The importance of education, i.e., the knowledge, is in the fact that when faced with the choice between different goals, it enables us to be fully aware of our choice. As Robins said: "In order to be rational, we need to know what we prefer, we need to be aware of the consequence of alternative choices and the implications of the different goals for which we determine ourselves to."

Education which is in the function of work or occupation is the dominant need of the agrarian. For this reason, we wanted to gain insight into the educational needs for vocational education and training, and how much the content of the work in the agrarian defines the educational needs. This due to a fact that Serbia has not adequately adapted the strategy and goals of the creative re-transition of the agrarian sector through the application of acquired and new competent knowledge, and above all, by expressing the interest in vocational education and training. Nobel Prize winner Samiel Son states: "The choice of your cheerful profession is the most important economic decision that you will make."

The search for the resolution of contradictions in agriculture opens the space for expressing creativity and strengthening development strengths through various fields of education, learning and by acquiring skills, thereby affirming the practice of the modern formula of the agrarian development. Use of knowledge enables the liberation of economic laws, strengthening of productive and market rationality and optimal activation of development factors of the agrarian sector. Raising awareness, training and qualifications of employees represent the key factors in market competition. (Radovic Markovic et al., 2012, p.27). This will, on the one hand, enable the selection and dominance of the best, both the most competitive and the most competent, and on the other hand it will lead to higher productivity and efficiency of human labor, the improvement of production forces by opening the system towards the development forces of the society.

For this step, the fundamental application of new developmental philosophies and active creative potential is required, and without education, the space for their creativity, development and their applicative ability for changes in types of production, in technology, property relations, organization of work and management can not be opened.

Knowledge, production and innovation are three complementary phenomena that interact with each other and represent the most important sources of change and the basis of the construction of a modern agrarian system based on knowledge. Modern development trends in the market economy show that science and education are at the very top of the priorities of global and national strategies and policies for socio-economic and technological development and progress.

Combined human and social capital make up intellectual capital, which by applying knowledge, skills and overall behavior creates and adequately uses all other resources. (Pejanovic, 2013, p. 503)

This implies creative and synergistic use of resources, and above all competent knowledge applicable in different areas: transferable skills and knowledge, new vision of

multidisciplinarity, as well as transdisciplinary competencies expressed through interest in professional education and training.

So, "The road to a developed society requires good quality education for all", and the economy of knowledge is the main tool for a new model of economic and social growth and development.

Education for the 21st century is not just one of many instruments of development; it is also one of its essential objectives and one of its components. (Delors, 1996, p. 69)

Compelling arguments are evident in the economic literature regarding the role of education in agriculture. In all the studies we analyzed, the average increase in agrarian production for 4 years of education in traditional conditions was 1.3% compared to 9.5% increase in modernized business conditions of agrarian organizations.

Most likely that even if we include more literature extracts covering the share of education, it would be insufficient. But even such a modestly developed insight into the literature shows and proves the seriousness of the educational role in agricultural development through values, abilities, knowledge, habits, competences and employees skills.

Jacques Delors said: "The concept of lifelong learning is the key to opening the door of the 21st century" (Delors, 1996, p. 99).

Empirical research

In line with the theoretical research, our empirical research has been focused on determining the interdependence of education and the work content of the employees in the agrarian sector.

By inspecting the diversity of needs, especially on the "scale" of educational impulses, conditions are created for designing education strategies in which all categories of employees in agrarian sector may pursue and use their chance and accelerate the innovation of their work activities to stimulate and enrich their activity with new quality methods and techniques and significantly enhance the capacity and variety of creativity.

Through the empirical research, we tried to determine the employees' attitudes on the utilization of acquired knowledge, during their education within their work organization, on the contribution of education and knowledge to the economic performance of the agrarian unit, how much education serves the function of technical and technological development, as well as the motives for the employees to engage in education, etc.

The survey was carried out on a sample of 470 employees from different working communities of agricultural organizations and different levels of education.

Table 1. Sample structure

Marking / Designation	Sample	N	%
Sex	*Male*	382	81,3
	Female	88	18,7
	Total	470	100,0
School completed	*Primary*	103	21,9
	Secondary	239	50,8
	Higher education	34	7,2
	College / University	69	14,7
	M.A.	17	3,6
	PhD	8	1,7
	Total	470	100,0
Work content	*Direct agrarian operators*	214	45,5
	Managers and experts	46	9,8
	Direct managers	82	17,5
	Scientists	47	10,2
	Administration	81	17,2
	Total	470	100,0

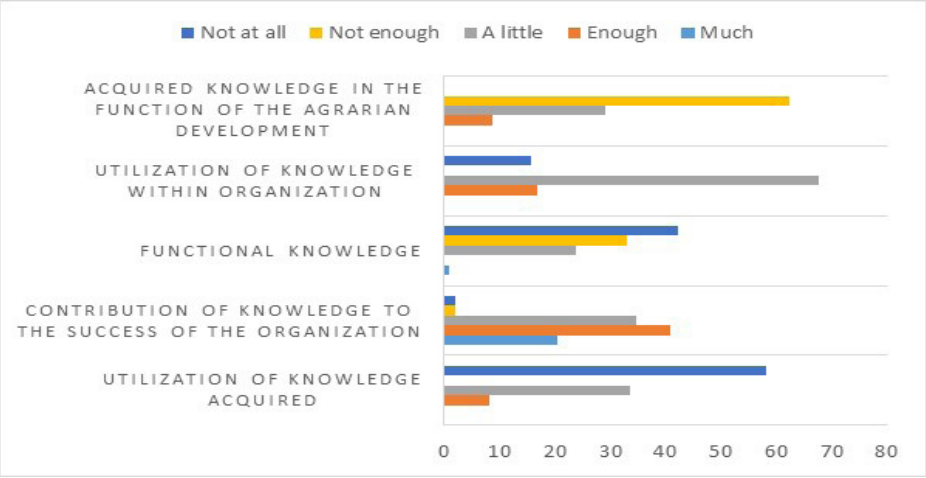
Respondents were surveyed individually and in smaller groups mainly in their workplace. The research was conducted during 2016 and 2017.

Results of research and discussion

Employee attitudes about the usability of the acquired knowledge during the education at the work they perform (Chart 1)

Utilization of knowledge acquired during schooling - Education is an important factor of productivity and economic performance. Our respondents believe that they use the acquired knowledge from the school at work (Chart 1): enough 8.2%, slightly 33.7%, and not at least 58.1%. These results are troubling, but expected at the same time, given the educational structure.

Figure 1. Employee attitudes on usage of knowledge acquired at work they perform



Source: Authors' calculations

Attitudes of employees regarding the contribution of knowledge and education to the economic performance of their organization: (Chart 1) - The results show that employees appreciate the contribution of knowledge and education to the economic performance of the organization: 20.5% sufficient, 40.8% enough, 34.7% not enough and 2% not at all. (Chart 1) The results obtained are not surprising, but it is difficult to say whether it is a consequence of the contents of the work or level of education of the respondents or some other factors.

Evaluation of the functionality of knowledge gained during schooling - The problem of the functionality of knowledge acquired in education is a serious problem, since it is certain that neither the economy nor the school are satisfied with the degree of usability of knowledge acquired through education. Direct agriculturists quite negatively evaluate the usability of knowledge at work acquired in school (Chart 1): 1% - sufficient, 23.7% - enough, 33% not enough and 42.3% no at all, which is in correlation with their level of education and content of their work. However, there are important differences depending on the content of the work of the employees in the agrarian sector, or between the professional categories. The most positive attitude towards the functionality of the knowledge gained by education was made by the researchers 71.4%, while in a relatively modest percentage such direct opinions and technical and engineering personnel account for 9.9%, senior executives and experts 15.2% and administrative staff 5.1% etc. And if different interpretations of these results are possible, it seems that more and more criticism of this problem is expressed by professional groups that need practical knowledge which is not really sufficiently provided by our education by achieving the connection between theory and practice.

The gap between the "world of work" in agrarian and "world of education" is huge. A high degree of criticism of the current concept of education has been demonstrated, i.e. it is believed that the educational institutions are not sufficiently in the function of work.

Readiness of the organization to use the knowledge and skills of employees (Graph 1) - Indicator of the organization's readiness to encourage education and acquisition of knowledge and its endeavor to fully utilize the knowledge and ability of employees is a significant motivational factor in education and the contribution of knowledge and education to the economic success of growth and development of the organization. Based on the established statistical indicators, we can conclude that the subjective assessment of the respondents about the readiness of the organization to use the knowledge and abilities of the employees significantly depends on the employees' work content. Almost two thirds of the results are grouped around the middle half of the variable - sufficient (67.7%), and according to the negative gender variable - insufficient (15.6%), and enough 16.7% of the respondents. In terms of the readiness of the organization to use the knowledge and skills of the employees the most critical are the direct executors in the agrarian sector, 28.9%, the direct managers and the engineering-technical staff (25.8%). As a rationale for this result, this result may serve with related research that in an agrarian organization, knowledge and education is less valued than in other organizations.

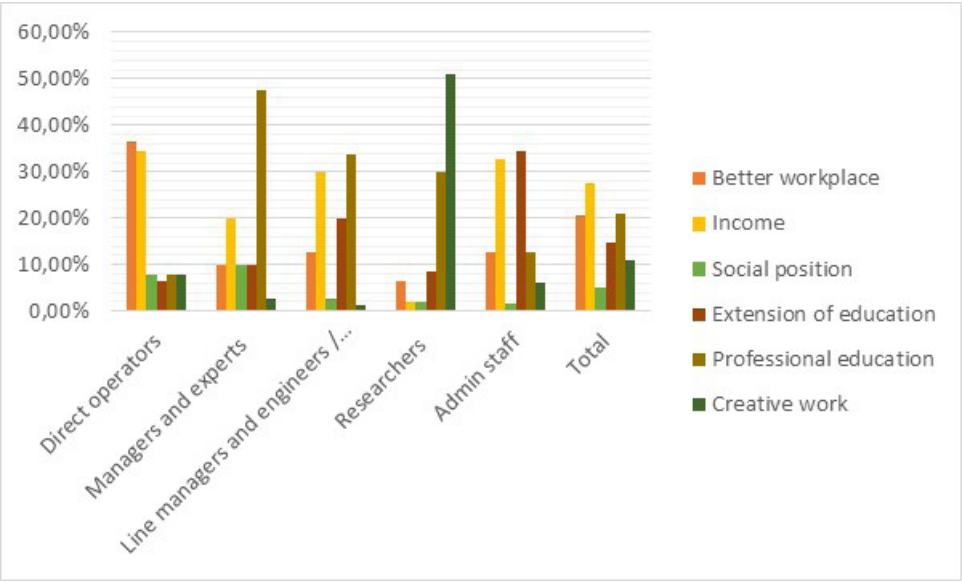
The assessment of the respondents how much educational knowledge is in the function of technical and technological development of the agrarian - the remark that the education system does not adequately respond to the requirements of scientific and technical changes are not without basis, because in our research on the question of how much school knowledge in the function of technical and technological changes, a great number of respondents estimate that knowledge is 62.4% insufficient, not enough 29%, and only 8.6% are sufficient (Chart 1). The most critical were the direct executors in the agrarian sector, who have the least knowledge in the field, which has certainly affected their assessments, while researchers, technical intelligence and senior executives and experts consider the educational knowledge to be in the function of technical and technological changes.

The fact that this result is not accidental is confirmed by the findings of other authors as well as in our research on the assessment of respondents that they are not familiar with technical and technological changes where almost 2/3 respondents answered - insufficient 59.4%, not enough 32.3% and enough 8.3%. The results indicate that the employees did not acquire enough knowledge for technical and technological changes, that is, after finishing school they did not supplement and refresh their knowledge in the profession, especially knowledge in the function of technical and technological development. Researchers are the only professional category that is fully familiar with technical and technological changes.

Motives for inclusion in education

The largest number of examinations shows that the most important place on the list of motives for the education of agricultural workers is "higher personal income" and "better workplace", also shown by our research, which follows this logic.

Figure 2. Employee attitudes on motivation for inclusion into education



Source: Authors' calculations

The results obtained are in line with previous research and confirm that the increase in personal earnings is the most frequent motivator for education and training of agrarian employees (26.8%).

The fact that the material gain is a priority motivator for the training of agricultural workers is confirmed by a significant number of employees who perceive the education as a way of getting a better job (20.1%).

This phenomenon of education and learning motives may be explained by an instrumental theory of motivation which basically involves participation in educational activities as a link to the ability to achieve the most important personal goals - higher personal earnings and a better work position.

Desire for professional development in the field is ranked in the third place when it comes to motives for education with employees in the agrarian sector (20.5%).

This type of motivation often remains outside the educational organizations, since the agrarian employees rely on individual work to expand their professional knowledge - to read books, professional journals, engage into personal contact with scientists and people who can help them.

The wish to expand education with agrarian employees as a motive for learning shows that employees are interested in expanding their knowledge and culture (14.8%) represents a very positive result. On the other hand, this also shows the desire of employees to get involved in all forms of education.

The possibility of creative work represents a significant motive (10.8%). The result is not surprising, inter alia, due to the structure of the sample in which researchers are significantly present and also because of the structure of labor within the agrarian sector.

For the employees in the examined organizations social position was, quite expectedly, not particularly important for learning.

It was natural to assume that the content of the agrarian work is a variable, which is significantly related to the choice of motives for education and training. This assumption is fully confirmed by the hypothesis set: The content of the work in the agrarian sector significantly influences the attitude of employees towards education and motives for inclusion in education and professional development.

Similarly, we can conclude, with high statistical probability, that in terms of content, respondents differ in the preferences of motives for inclusion in education and training.

The results of the survey showed that the most important motive for direct executors in agrarian (36.36%) was a better work position, and a large number of respondents in this category see better personal income (34.3%) as a motive for education and professional development.

With direct executives and engineering staff, the most important motive for inclusion in education is the professional training with 33.6%, followed by personal income with 30.0%, while administrative staff rather opts to engage in expanding their education with 34.4% to the personal earnings with 32.8%

The possibility of creative work as a motive for learning is ranked first with researchers (51.1%). Researchers show a high percentage of desire for professional development (29.8%).

Selection of Educational Area

We have assumed that the position in the occupation is a differential variable serves as the basis on which the examination of the category of employees in the agrarian sector varies considerably in the selection of the educational area, as evidenced by the results obtained in this research.

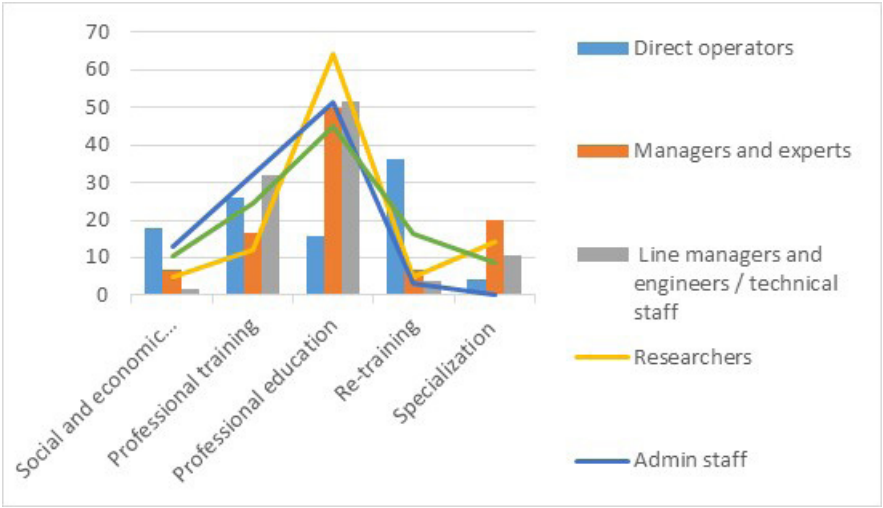
Responses to the questionnaire in this area (Chart 3) were given by 255 employees (54.3%), so 45.7% of employees can be considered as absolutely not interested in any form of education and training. It can be concluded that the employees who were interviewed showed a satisfactory level of interest in meeting educational needs in different areas of education and training.

The largest number of employees is interested in vocational education 45.1%, followed by vocational training with 24.7%, 16.4% decided to retrain, and pursue education from the socio-economic field 10.2% and 8.6% of employees are interested in specializations.

Therefore, vocational education represents the dominant wish of the largest number of employees, especially for the fact that a professional training intended for a work post through the retraining program and specialization are in the function of vocational education.

There is a significant difference among the examined groups when it comes to the choice of the field of education. Thus 64.3% of researchers, direct managers and technical staff choose vocational education with 51.8%, followed by administrative workers with 51.6% and senior managers and experts with 50%. Almost identically administrative staff (32.3) and direct managers and technical staff (32.1%) were identified for vocational training. As the third educational area, the retraining has been singled out, where the most interested parties are among the direct executors in the agrarian sector (36.4).

Figure 3. Employee attitudes about the choice of educational area to choose



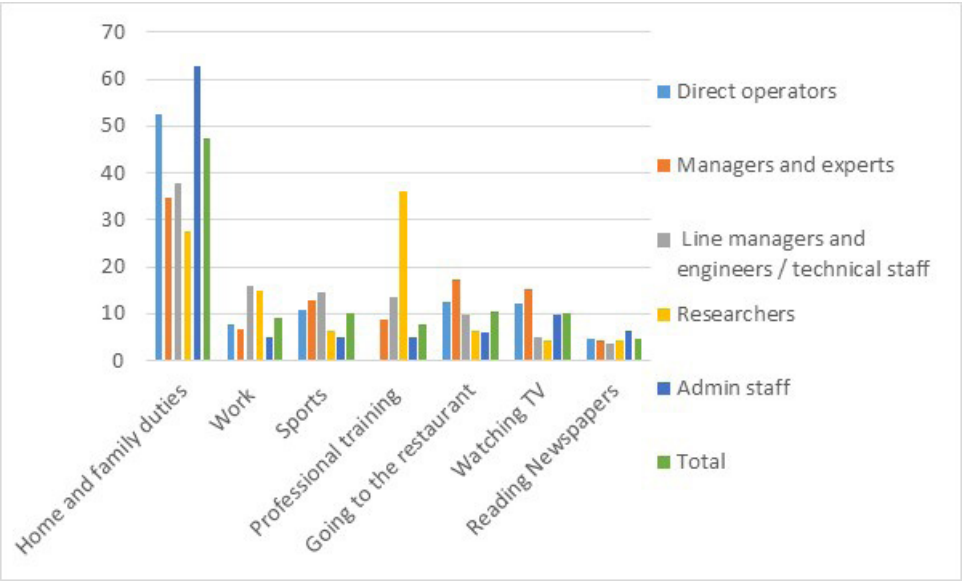
Source: Authors' calculations

The specialization program was attended by senior managers and associates in the largest percentage of 20%, while no administrative staff attended this field of study, and other professional categories did not have much participation in specialization programs.

Activities employees devote themselves after working hours and importance of education in these activities

By combining the content of work in the agrarian with the activities of employees after working hours, it has been determined that the examination of the group of employees varies considerably in the selection of activities. The most frequent activity after working hours go to household and family obligations (47.45%): for direct executives in agrarian (52.3%), as well as with administrative staff (62.9%), which is expected for administrative staff, since the largest number of respondents are women.

Figure 4. Employee activities after working hours



Source: Authors' calculations

It is interesting that direct agriculturists are not interested in education as an activity after working hours. This activity was rarely picked by administrative staff (4.9%), while senior managers and experts (8.7%) and direct managers and engineering-technical staff (13.4%) chose it in a slightly higher number. In case of research staff within the organization, learning and education occupy the most important position in post-business activities. Thus, 36.6% of research staff chose education and training as a post-job activity, and followed by activities related to domestic and family obligations (27.7%) and job-related activities (14.9%). It is obvious that learning and education among researchers has a dominant place in terms of after working hours activities, and that direct executors in the agrarian sector do not find themselves in these activities.

Analysis of results and conclusions

After analyzing the results of the research, we determined that the content of the work in agrarian, through groups of occupations and jobs, significantly influenced the attitude of the employees towards education. This impact is slightly reduced when age and school are taken into account, where older respondents generally have a negative attitude towards education from younger ones, while employees with higher education take a positive view of the contribution of education to the content of work in relation to employees with lower levels of education. Researchers have the most positive attitude towards education, and the most negative direct executors, which is in line with our assumptions and expectations, as well as the results of related research.

The research has determined the order of motives for education of employees in agrarian sector: increase of personal income; getting a better job; the desire to improve within the profession and the desire to expand knowledge.

The assumption has been confirmed that the content of the work appears as a variable significantly related to the choice of motivation for inclusion in educational activities. Direct agriculturists are dominantly occupied with motifs of utilitarian character.

The results of the research confirm to a great extent the results of our and foreign authors in relation to the interest of agricultural workers in certain types of education, and that the content of the work defines the variable of the preference of employees in the field of acquiring knowledge. At the same time, it would be desirable and necessary for the researchers of this the content of work as an incentive factor of education and learning is directly related to the wider environment, that is, socio-cultural environment, but also to the intellectual and psychological characteristics of the employees in the agrarian sector.

When determining the area and content of education, the practical requirements of the work and work situation of the employees must be taken into account. For example, it is expected that the primary interest of direct executors in agriculture is primary adult education, vocational training for workplace and retraining, while a small number of them are interested in programs with wider professional knowledge, which is mainly characteristic for other professional groups in the agrarian organization.

The conducted research, analysis and interpretation of the results of the research serve the function of perceiving, defining and understanding the direct contribution of education and its impact on the positive problems and development of the agrarian sector in the Republic of Serbia.

Agriculture needs something different from what we have today – expanding the space of science and education for new innovative programs with clearly controlled quality criteria. It is necessary to build awareness of interactive links between socio-economic development and education.

Large and far-reaching changes in the structure and content of work and work based on automation and high technologies, the intellectual content of rationalizing and innovative activities strongly affirm the need for continuous learning and education and an interest in the various dimensions of the professional and overall development of man and his civilization values.

The main challenge of the future period is the achievement of structural changes in agricultural development through the creative and synergistic use of resources, and above all the competitive knowledge.

Scientific study confirms that work and education, in agriculture, as an indispensable factor of social and personal development have an extremely important place and role in encouraging and satisfying different human needs.

Business and social skills – contemporary success formula

Are we a pilot or a traveler in life, work and time?

The fact is that time does not wait for anyone and successful people distinguish from the unsuccessful by the way they manage their time. To be successful does not mean that we need to work more but smarter.

Life and time often put us on test and face us with our own unrest, fears, successes and failures. How to overpopwer yourself, where there is just one problem, and that is me. We can not choose whether we will spend time, but rather how we spend it. Every day is a fresh account with 86,400 seconds or 1440 minutes.

Behavior in time management may be characterized as a combination of time estimation, goal setting, planning, and tracking activities. (Hafner, Stock, 210, p. 430) Time management is the way of life, a set of activities, procedures and resources in order to efficiently and effectively uses our time, both in business and in private life.

We will never have time for everything, and what may be done at any time is never done.

The key to success is dealing with solutions rather than problems through the stimulation of thought processes. The goal is to answer each question with another question, which literally makes you come up with the answer yourself. How - by taking an insight into your own way of thinking. This requires knowledge and skills, the existence of a positive goal and good intention; we need to know what we want. For someone, the reality is the cultivation of cucumbers, and for some other - aircraft production, the conquest of power, and so on.

Real goals are seen only by high rollers. Anything is possible; those who want to find a way will find it and those who don't, will find an excuse not to.

New time requires new knowledge and skills – application of new and creative techniques and coaching models that allow you to feel inspiring, to face both yourself and problems. One has to be brave in presenting himself in time and space in which we live and work.

The consequences of poor time management are poor communication, loss of creativity, search for good solutions, lack of determination and influence, conflicts, low probability of getting what is desired and a lot of stress.

This will be supported by the research on how managers manage their time: 54% work more than 10 hours a day, 71% regularly take their work home, 75% have dreams about work, 75% say they can't sleep due to their worries about work, 57% postpone their holiday or weekend. It is clear here that the managers are controlled by their duties, not vice versa. Managers direct their own energy against themselves.

Bad time management is one of the biggest causes of stress.

People are increasingly disintegrated by their individual networks and their relationships become increasingly complex and unpredictable, essentialy due to egoism and subjectivity, they are burdened with themselves, the individual wellbeing becomes more important than the general wellbeing.

So, the time will not let down those who can use it well.

Good quality organization requires time, but disorganization requires much more time. The trick is not to do everything, but to do what is important. We will remind you of Maximen's law: "I never have time to do it right, but there is always time to do it again". Very important assumption is to know your limits.

Which one is the right way when each one one apparently looks like the other one?

Thomas Edison once said: "I have not failed. I've just found 10,000 ways that won't work."

Don't let others to manage your time, organize yourself: set goals, sort them according to priorities and develop the action strategy, avoid activities that waste your time, simply say NO!

The success formula largely depends on the stress management on daily basis, representing the limiting factor of success. Under the "stress" we usually refer to the "physical and psychological tension that an individual feels when faced with the temptations of extraordinary demands, pressures or opportunities whose outcome is considered uncertain and important." (Robbins, Coulter, 2005, p. 323)

There are more and more disoriented angry, helpless, and apathetic people with failed expectations that are under constant stress.

What does a wise and successful man do when he experiences a fall? He rises and moves further aware of the price that he had to pay to get some crucial knowledge. Therefore, it is necessary to search for the truth in the desire to defeat the need for self-deception. Victory or defeat, success or failure, represent a large pot of challenges and chances.

Is there a guaranty? No!

"Stress and depression are the most widespread diseases of today", as told by psychiatrists and psychologists. That is a tribute that man pays to the computerization and subjugation of his to the career. (Pajevic, 2006, p. 297)

In such a virtual reality in which we live, our perceptions are easily changed; everyone has their own vision, their perception of reality, their expectations and personal desires. We are surrounded by "lightweight solutions", and technology and parallel information have created a new front of deception.

Can we learn to manage the stress?

Everything in life can be learned, even the stress management.

Approach to "hot" issues requires calmness.

We are part of the problem, but we are a very important part of the solution. If we can't solve a problem then it is no longer our problem. You have to decide what matters to you: to be right with your beliefs or to be successful and happy, because both do not go together.

Good business communication is one of the imperatives of successfully implemented of business ideas, as an inevitable process that should be constantly evolving. The right information at the right time is crucial for the quality of business decisions and decision making, increasing the speed of business processes and with the function to increase profits. (Karavidic, Radovic-Markovic, Cukanovic-Karavidic, 2013, p.229)

Essential importance of business communication is realized in the implementation of the goals of the agrarian organization; their development plan; organization of human and other resources in the most successful and efficient way; selection, development and evaluation of the organization members; guiding, motivating and creating a business climate and controlling overall organizational activities.

The expression of face and body language - non-verbal communication (50% - 55%) has the biggest influence on the interlocutor, then the way and tone of speech - interpretation (38% - 40%), while the content of spoken has the lowest influence (7% - 10%). (Bojanovic, 1998)

In doing so, one has to bear in mind what is characteristic for the message we send, what we want to challenge with the interlocutor, and how it will achieve its goal.

Modern methods of business communication have implications on work efficiency and economy, as well as on the establishment of a good quality business relationship, the relationship of trust and personal responsibility.

Table 2. Methods and professionalism in communication

PROFESSIONAL COMMUNICATION	**NON-PROFESSIONAL COMMUNICATION**
BODY LANGUAGE: posture, movements, seating, standing, walking	
Relaxed, calm, open	Stiff, cold, distant, tense
MIMICS: forehead, eyes, eyebrows, mouth ...	
Open, cheerful, eyebrows calm, mouth with a light smile...	Frowned forehead, frowned face, compressed eyebrows, mouth...
EYE CONTACT: watch your interlocutor	
Looks at the interlocutor as he talks to him, watches his movements, does not blink...	Does not look at the interlocutor, avoids eye-contact, goes through papers aimlessly, looks down ...
SPEECH: speed, rhythm, depth, voice, melody, laughter...	
Speaks slowly and clearly, makes breaks, does not make unnecessary digressions...	Speaks cold and fast, nervously, makes no breaks, supports conversation with different gesture...
GESTICULATION: arms and legs (applauding, mild touching of shoulders, etc.)	
Arms slightly lowered, calm, during the conversation makes sure to keep the interlocutor in an equal position.	Too much arm movement or keeping arms crossed; seated with legs crossed, taps nervously…

Conclusion

Through the theoretical and empirical research in this paper, we have confirmed the importance of education, knowledge and social skills on the institutional basis and the creative modernization of agrars that have, by changing the global economy, growing transitional contradictions and interest matrices, found itselves at a complex crossroads and in the numerous problems of its development.

Science and education represent the main drivers of economic development and its values, and the work (content of work and education) is the main pillar that connects many economic activities and represents the whole value of social development - the path and course of its development, the source of value. Because the world is going through a new technological revolution, social networks, applications and virtual currencies that change the global economy.

Education and learning may accelerate changes in the content of work and area of work, stimulate and accelerate the enrichment of work with new methods and techniques and greatly contribute to the improvement of one's creativity and lifestyle - the desire for success and satisfaction.

We are aware of the complexity of the problem examined, all difficulties in organizing education and the content of work and its elements as a success formula. Therefore, our theoretical and empirical research should be understood as an attempt to partially find out the essence of the interdependence of socio-economic development with the content of work and education in order to determine the positive indicators of these relations and to resolve the contradictions and doubts noted so far. In this we find a certain significance and value of our research work, which, hopefully, will start new research and discussions about this important problem.

It's never too late to change direction towards realistic and achievable goals with the motto: it must be better than this.

This may be the right time for that.

Conflict of interests

The authors declare no conflict of interest.

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FINANCIAL MANAGEMENT IN FOOD ENTERPRISES AND GLOBALIZATION OF ELECTRONIC BUSINESS IN SERBIA

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ABSTRACT

Use of finance in a certain form has been present and operational since the emergence of the world's first civilizations such as: Egypt, Greece, Babylon, Rome and others. At that time, however, the financial system was primarily based on archaic stores of value - gold or silver money. In its basic definition, finances were created with the concept of money and the development of its functions as a payment and transactional mechanisms. Where there is no money, there is no value. Money is the determinant, but also the function of finance. The development of finance as a science and its function relates to the emergence of the state, since it is the primary creater and backer of money. In this regard, public-state finances first began to be studied, followed by other finanical disciplines. Whereby the equilibrium arises from the payment of debt, collection of claims between states, enterprises and individuals.

Introduction

E-commerce is the purchase and sale of information, products and services through a computer network and support for various types of business transactions. It's about using online convenience and tools to enhance business processes to improve efficiency and productivty. E-commerce is a strategic business. It's not enough to simply introduce and apply the new technology. It is necessary to introduce organizational changes by creating a new business model. Due to strong global competition, international companies are under constant pressure to keep their customers, reduce costs, manage risk, and use technology as a source of competitive advantage. The model of global organization and strong competition requires a new concept of business, as evidenced

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by the increasing investment in specialized and client-oriented technology. The Internet is one such technology that enables the exploitation of the advantages of digital devices and connections, and in connection with digital information, with the goal of market entry and penetrating global markets.

The focus of this paper is the electronic business of global companies. The development of information and telecommunication technology has created more favorable conditions for many companies to globalize operations. The main goal of these companies is to provide an uninterrupted flow of information across organizational settings, regardless of geographical distance or the local environment. Information systems in the area of e-commerce can support achievement of this goal, only if they are viewed in a comprehensive, global way. Business globalization and strong competition require a new digital enterprise concept, as evidenced by the increasing investment in specialized and client-oriented technologies based on web and the Internet. The main goal of this paper is to analyze the primary elements of the information technology (IT) infrastructure of global e-businesses, their operational models and method of implementation. The end result of this analysis is to identify problems in the implementation of global e-commerce and propose possible solutions. In this context, an example of an agricultural company "1 December" in Serbia which successfully solved these problems, was analyzed. The general claim that e-commerce increases the competitiveness and profitability of this company was confirmed by the business practices of this organization.

The first chapter deals with global companies and the impact of the globalization process on e-commerce. In this context, these companies adopt a strategic approach to the implementation of global e-commerce, then formulate the most suitable strategy for functioning in a highly integrated and electronically networked global economic system. The second chapter deals with global e-commerce models that are available to companies that plan to market in global markets via the Internet. Special attention is paid to the B2C (Business-to-Consumer) model of global e-business and mobile e-commerce. In order to successfully implement this model, a global company should adopt a technological and business concept of global customer relationship management. The third chapter discusses the information technology (IT) framework for the implementation of global e-business. Every company that plans global e-commerce needs to ensure the smooth functioning of the basic elements of IT infrastructure, such as hardware infrastructure, global business applications, global telecommunication networks and databases. Also, it points to the basic problems and failures in designing global websites that are being developed to facilitate and more effectively position global companies into the global electronic marketplace. The fourth chapter analyzes the implementation of global e-commerce, explaining the most important activities of the implementation process. The first group of activities, which primarily emphasize the business and market dimension, include: analysis of business requirements, identification of target markets, development of market profiles, decomposition of business requirements, which can be functional (internationalization, localization) and requirements related to data (data concepts, data standards, etc.). The second group of activities relates to the technical

implementation of global e-commerce and the construction of a website. These activities include the development, testing, documentation and construction of a website. The fifth chapter deals with "1 December" company's e-commerce strategy. The practical example explains how this company has grown from a modest family business to a global company that penetrated the world market by successfully managing to take advantage of all modern e-commerce tools and quickly and efficiently applied them to their business operations. In the last, sixth chapter, an e-business plan for the Serbian market was presented. The abstract example of the farm was considered, or, in reality, this company would globalize its e-business in the territory of Serbia and neighboring countries, by adapting its strategy to domestic customers and consumers on the one hand, and business opportunities and conditions on the other.

Materials and methods

Corporate finance management can be viewed:

1) *As a scientific discipline - studying the management of finance in an enterprise*, is closely related to accounting and economics. It evolved from the science of finance over the last century, especially in the 1920's. At that time, with the development of joint stock companies and the expansion of financial markets, a large number of scientific papers appeared in this field.

2) *As a function of the company - includes the activities of enterprises related to the acquisition, financing and management of assets*, the main task of which is the provision of permanent sources of financing. Financial management is done through the management of cash flows; the financial activity is managed on the basis of knowledge of the economy, financial rights, etc.; Financial management includes planning, organization, motivation, control, and the like.

Financial management has a special place in the financial system because business finances are closely related to management, technology, resources, personnel, etc. Errors in financial management can lead to negative consequences in these areas, and financial problems are often the source of deeper business problems.

In Serbia, as well as in other transitional countries, financial management is only beginning to gain real significance, while in the first-world, market-driven countries it has long severed as a significant scientific discipline and practical activity.

Financial management of the company

The management of finance by traditional principle was the problem of acquiring capital, that is, in relation to liabilities of the balance sheet, which did not give an answer to the question whether the enterprise invests capital in a secure alternative. Previously, the financial function reacted to decisions that are brought by others. This approach was not sufficiently comprehensive. In the late 1950s, due to rapid economic growth and rapid technological changes, financial institutions, such as pension funds

and insurance organizations, experienced a major upswing. That is why the scope of manager's responsibilities increased: based on needs of shareholders and creditors (deposits), employees (wages), the state (taxes), and suppliers (collection). Managers are interested in the success of the company, because it provides them with higher salaries, and also because they are often shareholders. There was a need to use scientific methods in making financial decisions, and a modern approach to finance was developed. Unlike the traditional approach, modern access to finance is based on rapid economic growth and technological change, which has led to a significant increase in the importance of responsibility for the success of the company. Apart from the problem of purchasing capital, it deals with the assets and liabilities of the balance sheet.

Financial management should provide answers to three important issues:

• *What type of assets should the company obtain?*

• *What is the total amount of assets the company should have?*

• *How should the funds needed be financed?*

The importance of finances in the process of reproduction

Finances represent the totality of the relations created in the process of creating monetary funds of economic entities and the state, and their use in order to reproduce, encourage and meet social needs. The reproduction process consists of four stages: production, exchange, distribution and consumption. Financial resources are created at the stage of production, when a new value arises, but in reality, the financial resource is created only at the point of exchange, once newly created value is realized. Finances are divided into three areas: finance of business entities, insurance and state finances. Within each, special groups can be singled out. Each area is specific, but they form together a financial system of a country. Their connection is realized through banking system institutions. According to sources of creation, financial resources are divided into:

a) Those that are formed on the basis of own funds, share capital, shareholding capital,

b) Those who are in the financial market as a result of securities operations

c) Re-distributed, budget subsidies, insurance fees.

It is possible to distinguish (though not completely precisely) the three basic cycles of business activity:

• *Investment cycle* - contains a return relationship between investment (investment in financial resources) and in-process (profit-taking) operations of companies;

• *The current operations cycle* - contains the backward linkage of supply, production and placement operations (in some companies it is difficult to separate investment from current operations);

• *Cash cycle* - operations related to the management of free cash assets of the company: covering the short - term financial needs of enterprises by using loans.

The financial system of companies and the influence of prices on finances

Financial assets are required by the company for his:

1. *Establishment* - initial money is needed, which will provide the necessary factors of production;

2. *Business* - it is necessary to finance current operations, working capital, solvency and profitability;

3. *Development* - In order to enable development, new investments need to be provided.

All business decisions of the company have financial implications (positive or negative). All stages of the business process (procurement, production, sales, financing) should be viewed from a financial point of view. All assets and sources of financing, revenues and expenditures and cash flows are monitored and monitored. Salaries, taxes, dividends and other obligations are paid in cash. There factors for the financial system of a company. Price is an economic instrument whereby the value of a product gets a novel expression and becomes a distribution object. This is one of the main factors that influence the further distribution process: the price depends on the amount of cash available to the company to dispose of; Within the price, the proportions of the future distribution are determined.

The price through supply and demand influences the volume of financial sources and financial flows: the higher the price, the lower the demand (except for the most necessary goods and for goods of special demand). The price affects the period of capital revaluation and credit risk: by setting a certain level of the price, it can accelerate or slow down the turnover of capital; When moving goods (or finite instruments) from a producer (eminent) to a consumer (investor), the risk of spoilage or loss can be downloaded or handled.

The main financial goal of the company

The main objective of financial management at the state level is to consolidate the system of social relations – so that the various layers of society are not in an illegal state. Therefore, when making financial decisions, it is necessary: to evaluate their consequences, to try to reduce the costs of their realization, etc. The main financial goal of a food company is to maximize profits. For shareholders, the main goal is to maximize their assets. This is achieved by increasing the market value of the shares. There are three main decisions on which it depends whether the value of the actions and, therefore, the food company will increase or decrease:

1. The decision on investment (investment) in material / financial assets affects the structure of assets in the asset. If the investments are safe and profitable, they will lead to an increase in the market value of the shares.

2. The financing decision defines the structure of the financing of the company, i.e. means of obtaining funds for covering all obligations: from own or other, long-term or short-term sources.

3. Dividends and retained earnings decisions - if more dividends are higher, the demand for shares is also higher; retained earnings increase the firm's permanent capital, which can be used for investing.

These three decisions are interdependent. It is necessary to strive for their optimal combination in relation to the main goal – profit maximization, without compromising the survival of the company. Often, as a way of maximizing profits, maximization of earnings per share is advocated, which is not an appropriate goal.

Secondary financial goals of the company

The secondary objectives are: maximizing the net profit in the long run and strengthening the financial viability of the organization. Net profit is part of the gross profit (minus interest and taxes) that remains available to the company. The net profit is divided into joint stock companies:

• *Dividend profit* - from which dividends are paid,

• *Retained earnings* - Increases fixed capital, used to finance development, cover losses

• *Reserves* - for the coverage of business and financial risk.

Maximizing the overall win is not the best solution, because if this gain, for example, investors and shareholders will not benefit from it. The goal is to maximize the net profit achieved by maximizing revenue, and minimizing costs and minimizing taxes. The financial strength is a quantitative and qualitative component:

Quantitative financial strength - scope and value of assets. It requires: the matching of fixed assets with a business task (in order to avoid any unused capacity), the alignment of basic and working capital (in order to avoid stagnation); harmonization of short-term and long-term financing, harmonization of own and other capital, preservation of the financial balance. The quality of the financial strength is a permanent ability: payment of obligations within the term (solvency), short-term and long-term financing (current business and development), investments in material and financial assets, satisfying the financial needs of employees, managers and the state; preserving and increasing the property of the owner. The quality of financial strength is primary because it determines the possibility of doing business, while quantity determines the scope of business.

Tasks and objectives of financial management

In small-and medium-sized enterprises, financial activity is carried out by other departments: bookkeeping and information services. In big food companies, financial activities are clearly distributed between financial, IT and control services.

Organize characters to create an organizational structure. The choice of the organizational structure is from a large number of factors, such as the size of food organizations, activity, market, technology used, time to obtain products, time for decision making, information system, the type of management in the food company, the organizational

culture and organizational-legal form of the above-mentioned company.

These factors also affect the content of financial management activities differently. Activity management of finances can be structured in the following way:

1) General financial analysis and planning;

2) Providing companies with financial resources (management of sources of funds); and,

3) Allocation of financial resources (investment policy and asset management).

Classification of financial management decisions

Starting from efficiency, variants of decisions and systems can be:

• *Ordinary* - efficiency meets the norms for this industry. There are three types of variants: an inefficient variant (does not allow the problem to be resolved), rational (optimal) and optimal.

• *Synergy* - when they are accepted, efficiency is rising rapidly. Synergy solutions occur for example when developing new technologies. In financial management, the synergy effect of decision making is called the leverage effect.

• *Asynergic* - Reducing efficiency (e.g. due to delays in decision making).

If the food company wants to increase the volume of production, to restore the material base, etc, it has to invest. Influencing the investment decision influences the value of the project, the type of investment, the risk profile, the impact on profitability, among other factors.

There factors form the basis of investment allocations:

1. Spatial - if there are a few unknowns. projects for which there are no resources, inv. portfolio;

2. Time - if there are several independent, accessible projects that food company can not realize at the same time in the same year, optimal projects should be allocated over the years.

The decisions of financial management must include the following operations:

1) problem detection;

2) collecting information;

3) analysis of information;

4) setting the goal to be achieved by solving the problem;

5) decomposition of this goal into the objectives of each of the entities in financial relations;

6) determining the criteria for assessing the efficiency of each subject;

7) analysis of the possible consequences of making a decision;

8) development and assessment of different alternatives;

9) making decisions, reporting to perpetrators, execution and control of execution.

The interests of shareholders - to increase their assets, workers – are better earnings and better working conditions, and the interests of the state are - charging higher taxes – are often oppositie and contradictory to one another. If the objectives of managers and shareholders differ, management can act its own interest instead of the interests of shareholders. Managers will make optimal decisions only if they are motivated and controlled by stockholders.

Financial management of working capital

Total funds for financing business: equity of the owner, debt to third parties and earnings from business, are used for the acquisition of basic and working capital. Fixed assets are funds that are gradually spent and used longer in the business: land, construction objects, debt claims. Current assets are constantly spent in the production process or purchased for sale. These funds are often converted into one form to another (money / natural) and run in shorter terms. These are: all forms of money, short-term securities, short-term receivables (whose maturity is one year), all assets that turn around in the course of the year, all stocks.

The management of working capital assumes that investments in total working capital is maximized to realize as much business volume as possible. This maximizes profitability and maintains an adequate level of solvency.

The company should determine the optimal volume of net working capital - the difference between total working capital and short-term liabilities (obligations to suppliers for purchasing raw materials and materials, current operating expenses, and short-term bank loans). This volume is an indicator (not a cause) of solvency, it determines the profitability and risk, and arises from different combinations of long-term and short-term sources of financing.

Inventory management

An organization's inventory comprises a large part of total business assets, and require large cash investments. It is therefore important to maintain an optimal level of inventory - the level that represents the lowest total inventory costs. The inventory management costs are:

1. *Costs of stock acquisition* - arise when replacing spent raw materials and materials for production, as well as when replacing the stock of finished products for sale purposes. These are costs of: ordering, receiving, unloading, controlling and stockpiling ...

2. *The costs of keeping inventories* - are due to the existence and holding of inventories in the enterprise. These are the costs of storing, tying up capital, property tax, and so on.

3. *Costs of inventory shortage* - arise when there is a lack of stock of raw materials and materials necessary for production, as well as a lack of stock of finished products necessary to satisfy customer orders. These costs include: missed sales revenue, losses due to non-performance of production plans, loss of reputation among customers.

There are two basic types of stock decisions:

a) how much supplies should be obtained in one order - the optimal size of the order is the one that causes the lowest total cost of obtaining and holding the inventory;

b) at what intervals to obtain supplies - the optimal frequency of obtaining stock is the one that causes the lowest holding costs and lack of supplies.

Managing money

Managing money involves a constant balancing act between solvency and profitability, which is achieved by establishing an optimal cash balance. Each periodic cash deficit (reducing solvency, increased profitability) must have sources of coverage, while any surplus (reducing profitability because it does not generate returns, solvency increase) should have the possibility of a viable outlay outside regular business. When determining the minimum cash balance required, it is necessary to observe the costs that arise in relation to cash (holding, shortage, and cash transactions). The optimal cash balance is the balance that minimizes the total cost of cash, such as: the cost of holding cash - so there is no yield, cash drawdown - so it is not used by favorable purchase conditions, the costs of cash transactions - administrative, manipulative, commissions. In order to determine the optimal cash balance, the financial method is most often used, which is based on the fact that the minimum cash balance should be equal to the average annual balance required for the regular activities of the company. The cash turnover coefficient shows how many cash cycles occur during one calendar year. The cash cycle is the number of days that elapse from the moment of issue until the moment of cash receipt. The cash turnover coefficient is obtained when the number of days per year is divided by the (average) duration of a single craft. The task of the finance management is to reduce the average duration of the craft, i.e. to increase the cash turnover ratio. The goal of the company is to reduce the balance and total cash costs. Cash management should aim to get as much cash as possible and to invest, without compromising solvency. Temporarily free cash should be invested in securities, in order to generate yield. The company may acquire cash by issuing and selling securities. Non-cash payments from the payees' current account arrive at the current account of the company. The task of financial management is to synchronize the flows and outflows as much as possible (due to surpluses and deficits). Cash is paid only when cashless payment can not be made (retail sales, services to the population). Cash is kept in the cash register. Cash in arrears must be paid to the current account, and cash for payments is withdrawn from the current account. The inflow of money takes into account: money that is collected from sales,

borrowing (borrowing), if owners increase capital or reduce working capital. The inflow serves primarily to pay for procurement, to ensure business continuity. The outflow of money implies: investment in fixed assets, debt repayment, dividend payment and the increase in working capital. The difference between inflow and outflow increases or decreases the balance of money. Solvency is maintained through the adjustment of inflow and outflow. The inflow of money can be stimulated and accelerated, and the outflow slowed down. However, both have their own cost: the cost of convenience for early payment, that is, accepting higher interest rates, securing payments, etc.

Financial forecasting and programming

Deciding and forecasting are inextricably linked. The time period from the time the information is received to the moment of execution of the decision is called the administrative decision cycle (Cu). Cu = Vi + Vd + Vs, where: You have a time interval from the moment you receive the information to the moment of making the decision; Vd interval for decision making; and Vs for communicating and executing the decision made.

In the process of developing administrative decisions, it is necessary to make a forecast of its feasibility, which depends on the financial resources, the existence of the necessary organizational structures, and the motivation of the executors.

Financial forecasting is the examination of a possible situation, the possible ways to achieve this state of finances in the future, and assessing the probability of its realization. The main objectives of financial programming are: to specify the way to achieve goals; specifying the sources, flows and deadlines for the arrival of financial resources; specifying resource consumption; increasing the efficiency of resource consumption and ensuring control over the execution of the program.

The concept of financial planning

Financial planning is the presentation of various plans - procurement, production, sales – by set out financial indicators. Funding planning is synthesized in the financial plan. In financial plans, the goal of financial policy - the financial strength - is placed in time and space in a worthwhile manner. The financial plans show: what is going to be done, how, who will achieve the goal, when and where. The financial plan defines: sources of financing, allocation of financial resources, mandatory payments, deadlines for realization of financial measures. In this regard, financial planning can be divided into two stages:

a) Planning financial resources and flows; and,

b) Own financial planning.

According to the planning period, there are several timeframes: long-term (a period of 5 years or more), medium-term (up to 5 years) and short-term planning (up to one year).

Financial planning includes:

1) The plan of the profit and loss account;

2) Balance sheet plan;

3) Cash flow plan; and,

4) Plan of long-term investments (it expresses the scope, structure, duration of investment and structure of sources of financing).

Financial Planning

Upstream planning is the preparation of a plan for the enterprise as a whole. Financial planning is tasked with drafting and presenting the plan of activities of the enterprise and its needs for business assets in the sources of financing expressed in monetary form. The Summary Plan is not a simple set of organizational plans, it refers to the company as a whole - the plans of individual organizational units must be aligned and targeted towards the same goal. Monetary indicators of total business activity are represented by revenues, expenditures and financial results that are presented inclusively by periodic balance success. Since the revenue, expenditure and financial result of the various products and services, revenues, expenditures and financial results must be allocated to the bearers in the preparation of the supplementary financial plan. Planning revenue and expenditure is not sufficient in itself. The company must plan the total and additional needs for business assets without which the financial result can not be realized. The most important segment of the underlying financial plan is the sales plan - all other plans are conditional to this plan. The Initial Plan is a sales plan. It is based on long-term sales planning. Based on the sales plan, a production plan and production costs are adopted. The production plan is the basis for the preparation of the procurement plan and the procurement costs. All these plans are preliminary partial plans, but they are consolidated into the planned profit and loss account as a summary term. In addition to the profit and loss account, the company must also plan the balance sheet - it must plan the needs for business assets without which the planned volume of activities and the financial result could not be achieved. This plan includes: investment plans in certain categories of business assets (fixed assets, inventories, receivables, and cash) and the source plans from which these investments should be financed. The cash flow plan, which takes a central place in the plan, is important. The annual financial plan includes the plan and costs of sales, the plan and costs of production, the plan and costs of procurement, the R&D cost plan, the administration cost plan, the capital investment plan, the cash flow plan, the financing plan and the planned balance sheet and success – thereby representing a sophisticated financial plan. This is a comprehensive and coordinated plan of the activities of the company and its needs for business assets and sources of financing for a certain period of time Milojevic et al., (2017).

Results

The plan of the profit and loss account shows the expected amount of the financial result and its structure for a specific period. This plan is broken down by months or by product types, sales territories, customers, etc. This plans a net profit, which defines: profitability, preservation and increase of assets and maintenance of solvency. Within the planning of the profit and loss account, risks are identified and the possibility of their reduction is examined.

The correction of the profit and loss account is carried out according to the following scheme:

Changes in Current Assets and Liabilities Cash Influence Way of Correction

Increase in working capital (except cash) Decrease cash Retract from net profit

Reduction of working capital (other than cash) Increases cash Add net profit

Increase in short-term liabilities Increases cash Add net profit

Reduction of short-term liabilities Reduces cash Retract from net profit

Planning cash flows - cash

In order to protect solvency and maximize profitability, a continuous cash flow is required. The company can not ideally match the monetary benefits and losses. Therefore, at any time, there must be a cash balance, i.e. money supply that ensures the continuity of financial activity.

Cash flow control instruments are:

• *Cash flow statements* - synthesise cash receipts and benefits and show changes in the cash balance;

• *Cash flow plans* - analyze future receipts and benefits that will affect the increase or decrease in the cash balance.

There are two types of cash planning methods:

1. *Balance method* - based on various information (financial position of the company, planned volume of business activity, etc.), the expected balance sheet, profit and loss account and cash balance are projected at the end of the plan period. Within the balance methods, the following are distinguished:

• the projected balance sheet method - comparing the initial and projected balance sheet at the end of the plan period;

• the method of the adjusted income statement - translation of the planned revenues, expenses and net profit from the profit and loss account to the expected income, issuance and net cash flow from operations.

2. *Dynamic methods* - a dynamic cash plan is developed in three phases:

• A plan for receiving and giving cash on various bases is adopted, with the basic content consisting of flows related to regular business;

• a surplus and cash deficit plan - confronts receivables and benefits over a specific period of time and determines a surplus or deficit in relation to the minimum cash balance;

• Financing plan - determines the dynamics of borrowing and repayment, depending on whether it is a deficit or a surplus of cash.

Discussions

Traditional business is based on the use of structured paper documents in a previously defined and generally accepted communication between participants taking part in the business process. In today's modern business conditions, business transactions are primarily realized electronically. It is about e-business (e-commerce), which has been incorporated in almost every sphere of life. In general, e-commerce is the purchase and sale of information, products and services through a computer network and/or support for any type of business transaction Marjanović, (2008); Mičić et al., (2017).

E-commerce can also be interpreted as the use of computers in the implementation of business processes that arise by creating new opportunities, such as:

• A new, interactive way to access the market and partners, at the same time at the local and global level;

• The ability to perform certain business processes outside the company; and,

• Availability of plenty of information, with possible search elements and automated analysis; new models of business association, financial transactions and performance of business processes Stojanović, (2008).

The most popular e-commerce channel is the Internet. E-commerce emerged in the early 1980s, but only recently accelerated in adoption and development, primarily due to the Internet. There are two basic prerequisites for automating any business process. First, a description of all jobs in business processes that are automated must be defined. In other words, there must be a written document in electronic form, which contains a list of tasks for each individual workplace. The second is a description of the flow of information between jobs for each business process (»information workflow«), or a business process scenario (»event scenario«).

Internet and globalization of business processes

Globalization and the Internet symbolize the spirit of the times at the beginning of the new millennium and require looking at the world with a “fresh pair of eyes”. The Internet as a “network of all networks” is a metaphor of the new digital age Milićević, (2002). In addition to being an internet network, it is also software, and a new interactive

mass media, and ultimately implies a new way of thinking and a new culture. From an economic point of view, it is important that the Intenet provides the fastest possibility for growth in terms of sales and marketing in history, and the most effective means of communicating with the world at large. Changes experienced by enterprises of all sizes in the conditions of the Internet economy are compared with the changes that took place during the Industrial Revolution. While the Industrial Age shifted the transformation of physical resources, the information economy implies that the dominant resources include information and knowledge. It is believed that the success of the 21st century economy will be based on the "3 I's" - information, ideas and intelligence. There is an evident increase in the demand for services, as well as the expansion of online e-commerce, which represents the affirmation of the new trading pattern. Thanks to the Internet, space and time barriers have been demolished, thereby reducing the importance of the physical location of the company. On the whole, the Internet has led to significant changes in the economy. Webonomy refers to the study of the production, distribution and consumption of goods, services and ideas over the web (World Wide Web) (Schwartz, 1997); Schiller, (2000); Serour and Henderson-Sellers, (2004).

Today we can talk about a new web generation that communicates, operates, buys and entertains via the Internet as a basic tool, which has created significant business opportunities for existing e-commerce companies, and formed the basis for the emergence of many new Internet companies. In this way, the Internet and digital media are opening up new ways to create wealth. Many companies use the Internet to communicate with their customers and suppliers, creating new digital e-commerce networks that bypass classic distribution channels Jovanovic and Milovanović, (2010).

They also use the Internet to accelerate and increase the efficiency of internal business processes. The Internet reduces communication costs when coordinating business activities and communicating with employees. Researchers and administrators have noted that the Internet is a fast, inexpensive way to collect and disseminate knowledge. Global connectivity and low cost of the Internet help companies reduce transactional and agency costs, allowing them to connect directly with suppliers, buyers and business partners, and coordinate global-level activities with limited resources. Web provides interactive multimedia capabilities that can be used to create new products and services and closer customer relationships Shaw (2002) and Sharma and Kitchens (2003). Communication can be tailored to the specific needs of individual users and market segments. In this context, it is important to pay attention to the "new rules" that are relevant to business success in new conditions:

• Companies focus on maximizing the value of the business network;

• Competitive advantage is achieved by companies that know how to unify decentralized control points in the network;

• Human attention remains a real and rare resource, which is primarily related to visiting the company's website and to communicating via e-mail and i-forums;

• Physical proximity in the online world is replaced by multiple interactions at any time and from any point in the space - the transition from a concrete place to a global space;

• The principle of abundance rather than the rarity principle is affirmed in relation to the technological capabilities of multiplying electronic products at very low marginal costs;

• The achievement of the laws of growing yields is related to the characteristics of the network, whereby it is better to be connected to a larger network Shapiro and Varian, (1998); Ciric et al., (2018).

The process of globalization at the beginning of the new millennium is complex, multidimensional, full of controversy, dilemma and open issues. From the standpoint of the company, a strategic approach to globalization of business is relevant. It talks about a highly integrated and electronically networked global economic system.

However, the degree of globalization by individual activities is different. In addition, there are "winners" and "losers" of the globalization process. The rationalization strategy is a global strategy that implies directing activities to those parts of the global company, regardless of their location, which are most suitable for achieving desired results, and then sell products in those markets in the world where the highest profit is expected. In this way, managers need to consider factors such as costs, employee expertise, raw materials and capacity availability, and make decisions about where specific jobs will be performed, striving for the best use of company resources around the world. In practice, a global strategy often involves decision makers' ideas where to locate and how to coordinate individual activities. Most global strategies include a combination of foreign trade activities and foreign direct investment that reflect the dispersion of business activities. Trade and direct investment can be complementary, with very complex internal and external transactions and relationships. In recent times, there are often global e-commerce strategies, where global access is achieved thanks to the ability to communicate over the Internet. IT Hoffman and Novak, (2000); Humphrey et. al., (2003); Collison, (2006).

Development of global information and technology capabilities

Do global and multinational companies that advocate for their own global strategic vision truly accept such a vision? Then, after the implementation of their own global strategic vision, are they working to develop global information and technology (IT) opportunities to support such a vision?

If this is the case, then what is the most important mechanism that enables the development of global IT capabilities?

The illustration model shown in the picture (Figure 1) is a model for the development of global IT capabilities.

Figure 1. The image model illustrated in the figure is a model of global IT capabilities

Source: Mičić, 2018

Note: Own creation of the author according to the research model

Burn and Ash (2001) and Bean (2003) state that these three main issues are listed in case studies conducted between 130 global companies. The answer to these three questions is the key to thinking about how the company develops through the process of globalization and what role the IT sector has in the role.

Conclusions

Based on the study, we conclude that there are three basic global IT challenges, each characteristic of a particular type of global company:

1. Low level of geographical dispersion of business and high level of centralization is the approach that is mostly applied in small companies operating in a few countries. In this case, parent companies must have information systems (ISs) that allow much better planning for international information systems. For example, a Japanese domestic manufacturer runs a job in several countries and supplies its production bases using common data and application components through its own IT system.

2. High level of geographical dispersion of business and low level of centralization is most suited to large conglomerates that enable their own branches to develop their own strategic IT software. For example, one of the 100 largest world-renowned banks, the Bank of Australia and New Zealand, provides support through several affiliates and subsidiaries in several Asian countries in addition to its headquarters in Australia and New Zealand. Companies allow their local affiliates a significant level of self-control in the development of their own IT systems and strategies.

3. A high level of geographical dispersion of business and a high level of centralization is a structure chosen by global companies that have established strong strategic alliances with companies in the host countries. This approach includes both domestic and international ISs and encourages communication through IT within the company. For example, when a Pittsburgh manufacturer of glass, lacquer and chemicals made acquisitions and association with overseas countries, the company invested a lot of time in designing an appropriate information system to fit the corporate culture and local conditions. Their IT system in England is different from those in South America and Asia, due to different cultures of the local population and various personal opportunities. Today's integrated systems enable quick access to information in any part of the world. All three strategies are correct. What's important is to choose the right

one based on the profile of the company. It is essential that IT managers determine the type of organization that belongs to their company.

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Conflict of interests

The authors declare no conflict of interest.

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TECHNICAL EFFECIENCY OF TEA PROCESSING UNITS IN IRAN

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A B S T R A C T

This study used Data Envelopment Analysis (DEA) to measure the technical efficiency of tea processing units in Rudsar County, northern Iran. The required data sets were collected in 2014 by filling out questionnaires and interviewing with the managers of tea processing units. As an innovation, satisfaction level of the main buyer of the produced tea was considered as output in DEA model. Based on the results of CCR input-oriented model, 19% of tea processing units with efficiency score of 1 were identified as efficient units and 81% of units had inefficient performance. The minimum technical efficiency score is equal to 0.479 and the average technical efficiency in these units is equal to 0.727. The results of correlation analysis showed that there was a direct and significant correlation between the time of rolling and the withering temperature with the technical performance of tea processing units.

Introduction

Tea plantation in Iran is spread over 24 thousand hectares of northern lands. About 56 thousand households each year deliver tea leaves from their plantations to more than 160 units of tea processing units located in different counties of Guilan and Mazandaran provinces for processing (Presidential Strategic Planning and Control Office, 2015). These two provinces in northern Iran enjoy a temperate climate and fertile lands, giving them unique conditions for agricultural production like tea and related processing units (Hasanpour, 1998). Farmers deliver plucked leaves of tea to 160 tea processing units among which 148 units are located in Guilan province and 13 units in Mazandaran Province (Mahdavi and Abbasi, 2005). The process of turning green tea leaf into dry tea includes the operations of withering, rolling, fermentation, drying, sorting and packing of tea. Over 75% of the world's tea production is black, which is more than 90% in Iran (Hadipour Zimsar and et al., 2018). Black tea processing in Iran is usually done using orthodox method. In the sorting step, produced black tea categorized into different types of Ghalam, Shekasteh, Baroti and tea soil (Saberi and et al., 2012).

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The most suitable method for realizing the required growth rate in the agriculture sector is to improve and increase the efficiency and productivity of agricultural productions. Increasing efficiency can be considered as an appropriate and durable complement to a set of policies that promote the production of domestic products and promote the optimal exploitation of resources. Efficiency is a very important factor in the growth of resource productivity, especially in the agricultural economy of developing countries. On the one hand, these countries face the lack of opportunities for the development and acceptance of new technologies and, on the other hand, they do not use existing technologies efficiently (Ashrafi and et al., 2011). Increasing the efficiency of the tea processing industry can reduce the average cost of production, lower the level of tea market prices, increase demand and volume of sales, and increase the profitability of tea processing units, the outcome of which is the increase in the competitiveness of domestic tea in the market and as a result the growth of the volume of new industrial investments. Therefore, increasing the efficiency of tea processing units should be given special attention by the policy makers and economic planners of Iran. Tea imports caused Iranian consumers loyalty lost for domestic tea. However, self-sufficiency in agricultural production was always a concern for managers and planners in Iran. The importance of this issue is significant in terms of food security, job creation, the prevention of outflow of currency and its relations with other sectors and the share in Gross Domestic Production (Cheraghi and Gholipour, 2008). Tea production in Iran, due to the government's goal of self-sufficiency in the production of this product, has enjoyed a high growth since the early 1990s. This has spread due to the poor quality of green leaves, the processing, packaging and supply of tea. Thus, by supplying the products produced by this project, a sharp decrease in the purchase and consumption of domestic tea was observed due to its poor quality and dissatisfaction by consumers. Government policies caused the producers to not pay attention to investing in repairing and rehabilitating tea plantations and also, using old and depreciated technologies in processing black tea units (Sepehrdoust and Dastjerdi, 2013). Therefore, increasing the efficiency of tea processing units should be aimed at increasing the quality of production. The use of modern and appropriate technology in the coordinated set and the combination of factors of production and the proper allocation of inputs in an efficient management can play a significant role in this regard.

The fourth and fifth programs of economic, social and cultural development of Iran emphasized on the promotion of the share of efficiency and productivity of production factors in the economic growth of all sectors of the economy especially agriculture sector. Therefore, in the first step, awareness of the status of technical performance of production units and assessment of their condition is essential. Guilan and Mazandaran Provinces in northern Iran with moderate climate, fertile lands, rich soil and the ability to produce high quality agricultural products have unique features in the agricultural and related industries of this sector and therefore had the most suitable and prerequisite conditions for green tea leaf cultivation in Iran (Hasanpour, 1998). Iran's tea industry is particularly important among economic activities in terms of production and

employment. Increasing the production and improvement of the tea industry is not only in order to achieve economic growth and welfare in the region, but also had high interdependence with the independence and self-sufficiency of the economy, social justice, national and social aspirations. Iran's tea industry has less dependence on the foreign countries and can play an important role in generating employment and activating the business sector at the national level (Mahdavi and Abbasi, 2005). The present study investigates the technical efficiency of tea processing units in Rudsar County, northern Iran. Considering the different quality of products in the tea processing units, in this study as an innovation, the satisfaction of the main buyers from the quality of tea was also considered as one of the outputs in performance analysis.

The enhancement of efficiency in different sectors can pave the way for economic development and social welfare. Sustainability of tea plantation and processing in northern Iran is of particular importance. Improving technical performance of tea processing units enable competitiveness of Iranian tea and maintain market share of this product that ultimately sustain tea plantation and processing in northern Iran as a strategic business. This study investigates technical performance of tea processing units in Rudsar County, northern Iran and identifies the drivers of technical performance in tea industry of this region.

Literature Review

Few researches have been done in the field of economics and management of tea processing units. Qin and Zhou (1992) found that tea processing units energy use in rural areas of China was a function of the type of final product, tea cultivar and processing equipment. Wadonda (1998) showed that during the years 1984-88, the highest technical efficiency of the Malaysian tea industry was 72% in 1984. Also, the industry's lowest performance (44%) was in 1988. Gholizadeh and et al. (2008), investigated productivity and factors affecting it in the tea processing industries of Iran. In this regard, data set for 55 tea processing units and the mathematical optimization model were used. The results showed that the average productivity of the studied units was 71%. The number of productive units is 24% and the number of non-productive units is 76%. The lack of quality green tea leaves, low level of staff training and their professional skills are among the most important reasons for low productivity of these units. Taulo and Sebitosi (2013) present a method using index decomposition analysis (IDA), data envelopment analysis (DEA) and evolutionary algorithms for generating efficient frontiers in multi-objective optimization problems. The purpose of DEA is to measure the relative efficiency of decision making units and reflects the various preferences of decision makers. The index decomposition analysis aims at understanding the characteristics that underline changes in energy intensity at factory level. In addition, an evolutionary algorithm is used for directly finding Pareto optimal solutions. In this paper, we propose to combine DEA and EA and search for optimal solutions. Data from three Malawian tea factories has been used to test the effectiveness of the proposed method and the energy performance across the factories has been

evaluated. Hadipour Zimsar and et al. (2018) identify and analyze factors determining energy efficiency in tea processing units of Guilan Province, northern Iran. Results showed that the correct and sound design of the new hot air furnaces, the enhancement of technical knowledge of technicians in withering, fermentation, drying and storage units and optimum scheduling of withering operation with respect to the final status of green tea leaf were found to be the most important technical, managerial-policy and knowledge-skill factors determining the improvement of energy productivity in tea factories of Guilan Province.

Materials and methods

Data Envelopment Analysis (DEA) is a linear programming method that uses the information of organizations and production units as Decision Making Units (DMU) to make the efficient frontiers. The mentioned frontier is based on DMU's information in the form of inputs and outputs and based on sequential linear programming results, and in fact the ineffectiveness of each DMU depends on the distance between the unit to the efficient frontier (Azar and Moetameni, 2004). This method can involve multiple outputs and inputs without the need for pre-determined weights (as opposed to the index method) and without the need for clear specifications of the relationships between inputs and outputs (as opposed to the regression method) (Mehrgan, 2004). Data envelopment analysis has become one of the most common performance evaluation methods with unique capabilities, and many researches in this area have tried to measure performance using this method (Azimi and et al., 2017; Tsuar and et al., 2017).

In order to measure the technical efficiency of tea processing units, the model provided by Charnes, Cooper and Rhodes, known as the CCR, was used (Charnes et al., 1978). Constant Return to Scale (CRS) means that every multiple of inputs produces the same multiple of outputs. In this model, by changing a unit in the inputs, the outputs also change with a constant (decreasing or increasing) ratio. In fact, the slope of the production function in this model is constant (Coelli, 2008). The calculation of the return to scale model for K inputs and M outputs that exists for each tea processing units will be as follows (Emami Meybodi, 2005):

$$\begin{aligned} &\text{Max } \frac{U' Y_i}{V' X_i} \\ &\text{Subject to:} \\ &\frac{U' Y_i}{V' X_i} \leq 1 \\ &U \geq 0,\ V \geq 0 \end{aligned} \qquad (1)$$

In which, U was M×1 vector of outputs weights, V was K×1 vector of inputs weights, U' and V' were transpose vectors for U and V, X represented for M×K matrix of inputs levels and Y showed M×N matrix of outputs levels. Matrixes X and Y represent all

information for the N tea processing units (DMU). The above pattern has an enormous number of optimal solutions. To avoid this problem, the restriction $V'X_i = 1$ is imposed on the model (Emami Meybodi, 2005):

$$\begin{aligned} &\text{Max}_{\mu,V}\,(\mu' Y_i) \\ &\text{Subject to:} \\ &V' X_i = 1, \\ &\mu' Y_j - V' X_j \le 0, \quad j = 1,2,\ldots,N \\ &\mu, V \ge 0, \end{aligned} \tag{2}$$

In linear programming, generally imposing fewer constraints makes it easier to solve the problem. The use of the dual form delivers the technical efficiency level (θ) for each tea processing units, separately. Hence, in general the following pattern is most often used (Jahanshahlo and et al., 2007):

$$\begin{aligned} &\text{Min}_{\theta,\lambda}\,\theta, \\ &\text{Subject to:} \\ &-y_i + Y\lambda \ge 0, \\ &\theta x_i - X\lambda \ge 0, \\ &\lambda \ge 0, \end{aligned} \tag{3}$$

In which, θ was quantitative amount and λ was N×1 vector of constant levels.

The inputs included in the study were the processing unit production costs and the cost of buying green tea leaves from framers. Also, the outputs included in the modeling were the value of the tea processing unit's total production, and the degree of satisfaction of the main purchaser of tea from the processing unit. Due to the different quality of the tea product, the buyers' satisfaction with this product is very important. In order to measure the satisfaction of the major buyer of tea for each processing unit, the use of the Likert spectrum was considered.

The required information in this study was collected by questionnaires and survey. The questionnaire for tea processing units was designed in two sections. In the first section, the demographic characteristics of the manager include age, gender, education, etc. were questioned and also the characteristics of employees were studied include the number of skilled and unskilled labors in the processing unit, the education level of employees, the production experience and the wages of the employed individuals. The second part of the questionnaire was devoted to production costs including fuel, water, electricity, depreciation and etc. and processing unit revenues including sales of various tea qualities. Satisfaction of the major buyer of tea from each processing unit was also questioned by telephone. The required data sets were collected at 2014.

Results and Discussions

The main research tool in this study was a questionnaire. In order to ensure its validity, its copies were provided to 10 experts of the Iran Tea Organization (ITO), and modifications were made based on their feedback. In order to ensure reliability of the research tool, the designed questionnaire was administered to 10 tea processing units. The reliability of the study tool was evaluated by Cronbach's alpha test (α value equals to 0.83), implying the questionnaire reliability. Data set were analyzed using $SPSS_{20}$ and DEAP software packages.

The study of the characteristics of employees working in tea processing units showed that among 16 managers in the studied units, according to age groups, most of the managers (50%) were in the age group of 50 to 60 years. The youngest manager was 45 years old, and the oldest was 68 years old. All managers of tea processing units in the Rudsar County were male. Most of the managers of these units (62.4%) had a university degree. In the studied tea processing units, skilled labors were responsible for guiding and leadership of unskilled labors. The average number of skilled labors in the studied processing units was 3.75 workers with the minimum number of 2 and maximum number of 4 workers. The average number of unskilled labors was 46.06 workers with the minimum number of 25 and maximum number of 75 workers. The whole unskilled labors at the studied tea processing units had education level of under the diploma (78%) and diploma (22%). Most of skilled labors (93.7%) had more than 6 years' experience in tea processing units. Monthly income for most of skilled labors (93.7%) was more than 10 Million Rials while most of unskilled labors (93.7%) received less than 7.5 Million Rials per a month of working (shown in Table 1).

Table 1. Frequency distribution of employees' characteristics in tea processing units.

Characteristic	Level	Frequency	Percent (%)	Average	S.D.
Manager Gender	Male	16	100		
	Female	0	0		
Manager Age (years)				56.47	7.78
	< 50	4	25		
	50 - 60	8	50		
	> 60	4	25		
Manager Education level	Under the diploma	1	6.3	-	-
	Diploma	5	31.3		
	Associate	6	37.4		
	Bachelor	4	25		
Management Experience (years)				11.12	4.55
	< 8	2	12.5		
	8 -13	10	62.5		
	> 13	4	25		

Skilled labor education level	Under the diploma	1	6.3	-	-
	Diploma	10	62.4		
	Associate	4	25		
	Bachelor	1	6.3		
Skilled labor experience (years)				10.33	3.6
	< 6	1	6.3		
	6 - 10	11	68.7		
	> 10	4	25		
Monthly income of a skilled labor (Million Rials)				11.5	1.2
	< 10	1	6.3		
	10 - 12	12	75		
	> 12	3	18.7		
Monthly income of an unskilled labor (Million Rials)				7.4	0.2
	< 7.2	3	18.7		
	7.2 – 7.5	12	75		
	> 7.5	1	6.3		

Investigating the cost components of the studied tea processing units in a production period (6 months) showed that in average, the labor costs had the highest cost share (45.58%) and the cost of water supply had the least cost share (0.05%) among the different cost items (shown in Table 2).

Table 2. Frequency distribution of cost components and revenue of tea processing units.

Item	Level	Frequency	Percent (%)	Average	S.D.
Skilled labor cost (Million Rials)				261	47.15
	< 240	4	25		
	240 – 288	4	25		
	> 288	8	50		
Unskilled labor cost (Million Rials)				2044.59	742.74
	< 1350	3	18.75		
	1350 – 2700	8	50		
	> 2700	5	31.25		
Fuel cost (Million Rials)				45.37	32.98
	< 20	6	37.5		
	20 – 40	2	12.5		
	> 40	8	50		
Electricity cost (Million Rials)				20.97	12.46
	< 10	4	25		
	10 – 20	4	25		
	> 20	8	50		

Item	Level	Frequency	Percent (%)	Average	S.D.
Water supply cost (Million Rials)				16	2.7
	< 10	9	56.25		
	10 – 20	3	18.75		
	> 20	4	25		
Maintenances cost (Million Rials)				31.12	24.15
	< 20	8	50		
	20 - 40	3	18.75		
	> 40	5	31.25		
Revenue (Billion Rials)				15.7	12.98
	< 10	8	50		
	10 – 20	3	18.75		
	> 20	5	31.25		
Satisfaction of the main buyer	Very Satisfied	2	12.5	-	-
	Satisfied	7	43.75		
	Borderline	3	18.75		
	Dissatisfied	3	18.75		
	Very dissatisfied	1	6.25		

The results of the CCR model showed that 19% (3 processing units) were efficient and 81% (13 processing units) had inefficient performance (shown in Table 3). To reach the efficiency frontier, the inefficient units could benchmark the efficient units (Peers).

Table 3. Technical Efficiency (TE) of tea processing units.

Units	TE Score	Peer 1	Peer 2
1	1	-	-
2	0.699	10	1
3	0.324	1	7
4	0.754	1	7
5	0.508	7	
6	0.537	1	7
7	1	-	-
8	0.732	7	10
9	0.672	7	10
10	1	-	-
11	0.968	7	10
12	0.479	7	1
13	0.811	1	7
14	0.959	7	
15	0.494	1	7
16	0.689	1	7

The average TE score of the studied units was 0.727, which suggests an increase of 27.3% of output without increasing inputs in case of efficient operation of all tea processing units.

In order to evaluate the effectiveness of the processing system characteristics on the efficiency score of the studied units, the correlation analysis was used (shown in Table 4).

Table 4. Correlation of processing system characteristics with TE in tea processing units.

Variable	Scale	Test	Coefficient	P-Value
Lifetime of processing devices	Ratio	Pearson	-0.125	0.644
Education level of manager	Ordinal	Spearman	0.310	0.243
Experience of manager	Ratio	Pearson	0.227	0.397
Rolling duration of young apical shoots	Ratio	Pearson	0.502	0.047
Rolling duration of mature leaves	Ratio	Pearson	0.119	0.662
Withering temperature of first flush tea leaves	Interval	Spearman	0.001	0.99
Withering temperature of second flush tea leaves	Interval	Spearman	0.467	0.038
Withering temperature of third flush tea leaves	Interval	Spearman	0.545	0.029

The results showed that the rolling duration of young apical shoots (soft leaves) had a significant effect on the technical performance of the tea processing units. There was a direct and statistically significant correlation between the rolling duration of young soft leaves and TE of tea processing units at 5% level. Also, withering temperature of first and second flush tea leaves was also effective on the technical performance of these units. There was a direct and statistically significant correlation between these temperatures and TE of tea processing units at the 5% level. The correlation coefficients for rolling duration of young apical shoots and withering temperature of third flush tea leaves showed relatively strong correlation with TE but the coefficient of withering temperature of second flush tea leaves revealed moderate correlation with TE of tea processing units.

Conclusions

Given the level of competition in the tea market of Iran, the goal of tea processing units is to attract more resources and reduce costs, and most importantly, increase efficiency and income generation. Effective units have better performance in resource absorption, optimal allocation of resources, and optimal production. To determine the key variables of the tea processing units' efficiency is imperative to account the combined effects of the inputs interaction beside the buyers' satisfaction of tea quality. Regarding the efficiency scores and the results of correlation analysis, it can be claimed that factors such as technical knowledge of labors and the observance of specialized processing principles have a significant effect on the efficiency or inefficiency performance of the units and lead to increased efficiency and income. Regarding the fact that in this study, rolling duration and withering temperature had statistically significant correlations with the technical performance of tea processing units, it is recommended that by conducting training classes and upgrading the technical knowledge of the labors in the processing units, the production of quality tea to be realized. The review of lessons learned by leading tea manufacturing countries like Indian and China would be useful in this way. Increasing farmers' awareness of lopping and trimming has a significant role in the quality of tea production and improves the effectiveness of the rolling and withering

processes and ultimately has a direct effect on the better sale of produced tea. This requires more and better supervision of professional experts on tea plantations and farmers works. The technical support of the Iran's tea organization, the technical skills of the experts, the supervision of the responsible purchasing officer on the quality of the green leaves, the communication skills of the experts with the farmers, the proportion of training courses held with the needs of experts, are also among important factors affecting the performance of the tea processing units in Iran.

Conflict of interests

The authors declare no conflict of interest.

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„BUY NATIONAL„ CAMPAIGNS AND FOOD COUNTRY OF ORIGIN LABELING – EU LEGAL FRAMEWORK AND ITS RELEVANCE FOR SERBIA

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ABSTRACT

After the entry into force of the Stabilization and Association Agreement, liberalization of trade in foodstuff with the EU and CEFTA countries, followed with broadening of the network of wholesalers and supermarkets which distribute imported agricultural products and foodstuff to Serbian consumers, origin labelling and promotion of domestic products in Serbia becomes an important issue. Using predominantly a comparative law method and qualitative analysis, on the basis of a number of possible options within the framework of national country of origin labelling schemes, the paper argues that the new quality initiative "Serbian quality" should be enriched with well-designed and coordinated measures promoting Serbia as a country of origin. By providing a legal framework and criteria for qualification whether promotion tools are legitimate or have equivalent effects to quantitative restrictions on food import, the paper aims to stimulate a discussion on the national initiative.

Introduction

Ethnocentric „buy national" or „buy local" campaigns, geographical indications and quality schemes which allow for the registration of protected geographical names represent both policy tools to inform potential consumers on the origin and specific properties of agricultural products and processed food, and marketing tool which aims to highlight their national, regional or supranational character and boost the consumption. Whether it takes the form of promotion campaign as a non-formal instrument, formally

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acknowledged quality scheme or the industrial property such is the geographical indication of origin, mandatory or voluntary origin labelling and promotion of origin as informational regulation of food origin reflects greater values and the impact of the origin or provenance on the qualities of the food. Innovations in food labelling aim to promote health, environmental and social sustainability of food production, culture, traditions and most recently risks of the new technologies (Albert, 2010).

Promotion of consumer ethnocentrism to protect national economies within the EU clashes with the main idea of the single market in agricultural products and foodstuffs as goods. "Buy national" and "buy local campaigns" are in accordance with the EU law in so far they are not sponsored by the State. The initial, strict approach to condemn campaigns encouraging the purchase by national food which was grounded by famous *Buy Irish* case of 1982, seems to be challenged by the new European approach on consumer information on the origin of foodstuff. The uncertainty in the dynamics of EU accession, recent developments in the EU food law on origin labelling and transnational regulation of the global food markets urge for the reconsideration of the promotion and labelling of domestic agricultural production and domestic consumption of food produced in Serbia. A careful balance must be stricken between the duty to harmonize legislation with the EU food law and to respect the principle of the free movement of agricultural products and foodstuff as goods, on one side, and the necessity to promote consumption of Serbian products in Serbia and in the third countries, including the EU.

Food ethnocentrism

Consumer ethnocentrism is defined as "the beliefs held by consumers about the appropriateness, indeed morality, of purchasing foreign-made products." (Shimp and Sharma, 1987, p. 280) The effect of "country of origin" has added an important variable to the concept of consumer ethnocentrism, as this indication is an informational cue which helps consumers evaluate products and develop attitudes (Papadopoulous, 1993). Justification of domestic purchase is also widespread to refer to ethical consumerism, where consumers intentionally purchase products considered to be made ethically. Apart from protection of national traditions, consumers, public finances and the environment, national food self-sufficiency and food security is often voiced as justification of state campaigns to enhance consumer ethnocentrism (Hojnik, 2012). A product's county of origin can be presented to the consumer as "made in" label, by embedding of country or regional reference into the brand name, or promotion of the brand's selling (e.g. French cheese). Consumer ethnocentrism could be influenced by culture and family upbringing, but may also be the result of promotional campaigns. In addition to workers, producers and their associations and consumers, states may also intervene to boost domestic demand, especially through protectionism in public procurement.

The research on motives for food choice in Serbia is gaining importance in recent years (Milošević et al, 2012). Studies identified consumer skepticism, especially with regards to nutrition and health claims on food products (Mitić, Gligorijević, 2015; Gagić et al.,

2014). In domestic academic literature, a growing interest in detecting the relationship between the product country of origin and national identity could be observed (Šapić et al., 2018). Ethnocentrism of Serbian consumers has been explored in relation to brands of consumer products (Veljković, 2005). Empirical research has shown that consumer ethnocentrism in Serbia is higher among rural, older and male population (Marinković et al., 2010). Consumers in Serbia gave the highest rating to the national identity among variables such are foreign and local food products, whereas local food products rank lower than national (Šapić et al., 2018).

"Buy national" campaigns as barriers to free movement of goods and the new EU policy on promotion measures

The most famous campaign in the EU was run some thirty five years ago, by the Irish Government and its Goods Council to encourage the sale of goods bearing the "Guaranteed Irish" label. In a landmark case often referenced to as *Buy Irish* case (Case 249/81, *Commission v Ireland)*, the Court of Justice took a stance that not only direct organization of national campaigns by Ministries of agriculture or other public bodies, but also sponsoring and indirect influence of the potential and indirect nature, may represent obstacle to imports, and is therefore contrary to article 34 of the Treaty of Functioning of the EU in a sense that it represents a barrier to trade in goods. The same reasoning was applied in relation to the actions of the German Fund for quality marking (Case C-325/00, *Commission v Germany*). At the beginning of 1990s, German central marketing body (*Centrale Marketing Gesselschaft*) instituted a special quality label (*Marquenqualität aus deutschen Landen*) to promote quality products manufactured in Germany. Similar to this, the Austrian Agrarmarkt Marketing GmbH, a body established by the Austrian Ministry for Agriculture, established a quality seal "*AMA-Gütesiegel – Geprufte Qualität Austria.*" Similar means of promotion of value and quality of agricultural, food and wine products were launched by public bodies usually established by ministries of agriculture in Italy (*BuonItalia SpA*), France (*Sopexa S.A.*), however the measure of a public authority in the form of advertising in favour of domestic products was not so explicit. The decision in *Buy Irish* case explains that State-sponsored promotion of national goods is illegitimate if it is primarily focused on national origin of goods. On the other hand, the promotion of specific goods having distinctive qualities, besides those of national origin, is permissible (Gormley, 2010; Hojnik, 2012). References to quality control are legitimate only if products are subject to an objective system of control (Case 222/82, *Apple and Pear Development Council v K.J. Lewis Ltd*). In a regulatory approach that is related to food quality rather than to safety, a label that bears a geographical indication provides information on the origin, quality and tradition (Echols, 2008, p. 30).

The EU implements promotion policy to help farm producers sell their products in a competitive global food market and enhance the authenticity of Union products. EU funding for food information and promotion initiatives within and out of the EU is rising from €142.5 million in 2017 to €188.5 million in 2018, and projected to reach

€200 million in 2020. The two existing kinds of promotion are: 1) promotions run by European trade or inter-trade associations and co-financed by the EU, 2) promotions run by the EU, such as diplomatic campaigns, participation in fairs and communication campaigns to promote EU farm products.

On the basis of Regulation 1144/2014 on information provision and promotion measures concerning agricultural products implemented in the internal market and in third countries, by its Implementing Decision the European Commission defines the strategic priorities and funding criteria in a yearly work programme which outlines eligible products and possible markets. Promotion measures should not be brand or origin oriented. Brands and origin could be mentioned provided that the principle of non-discrimination is respected and measures are not aimed to encourage the consumption on the sole ground of origin. However, Article 4. par. 2 of this Regulation seems to provide a ground for discrimination of origin oriented promotion measures in non-EU states. Namely, origin of products could be visible in the internal market, where "the mention of the origin must always be secondary in relation to the main Union message of the campaign", while "in third countries, the mention of the origin may be on the same level as the main Union message of the campaign". In both cases, for products recognized under the quality schemes, the origin may be mentioned without any restriction.

The strategic policy is implemented through the Consumers, Health, Agriculture and Food Executive Agency. While multi-programmes involve at least two organization from at least two EU countries or one or more EU institutions and its financing is implemented by the Commission under direct management, the so called simple programmes involve one or more organisations from the same EU country and their financing is implemented by national administrations. Article 7 of the Regulation 1144/2014 specified which organisations may propose information and promotion programmes. These are trade or inter-trade organisations, established in a Member State and representative of the sector, and such organisations of the Union representative of the sector or sectors concerned, producer organisations or associations of producer organisations recognized by a Member State, and lastly, agri-food sector bodies the objective and activity of which is to provide information and promote agricultural products. Such agri-food bodies have to be specifically entrusted with a clearly defined public service mission by the Member State and must have a legal personality for at least two years prior to applying for the programme.

The EU normative framework on the protection of the origin of foodstuffs and national country of origin labelling

Geographical origin as a tool of influence can represent an intellectual property tool, or informational tool. In both cases provision of information is the key element, but intellectual property attribution represents a higher dimension of the quality reputation. To prevent the misuse of notorious geographical names, the EU has established two different systems of intellectual property rights for the protection of the origin of agricultural products and foodstuffs: 1) the system of registered geographical names

(based on the Regulation 1151/2012 on Quality Schemes for Agricultural Products and Foodstuffs) and 2) European Union trade mark containing a geographical name (established on the basis of Regulation 2017/1001 of the European Parliament and of the Council of 14 June 2017 on the European Union trade mark– EUTM) (Couter, d'Ath, 2016; Jovanić, 2013; Blakeney, 2016). Whereas the former is limited to agricultural products and foodstuffs intended for human consumption (all products of the soil, stock farming, fisheries and some non-food products listed in Annex I of this Regulation, excluding spirit drinks regulated by separate legal instruments), the latter is not limited to food products. Geographic indications and trade marks for spirit drinks and especially wine are subject matter of the Regulation 1308/2013 of the European Parliament and of the Council of 17 December 2013 establishing a common organisation of the markets in agricultural products ("Official Journal of the EU", no. L347) (Lučić, 2018).

Regulation 1151/2012 on Quality Schemes has established three different schemes for which the use a quality symbol is compulsory: a) the Protected Geographical Indication (PGI), b) The Protected Designation of Origin (PDO) and the Traditional Specialities Guaranteed (TSG). The third scheme relates to the traditional methods of production and recipes, and does not directly concern the origin. PGI and PDO often consist of the name of a city, region/country and a generic name of the product. Some examples are ham *Jambon d'Ardennes* or a French cheese *"Roquefort"*. However, a geographical reference is not decisive; such is for example, PDO "*Feta"* designating a white cheese from Greece.[4] By contrast, if the product has a generic name, and does not derive its qualities from natural factors, but represent a subtype of a product, such is for example the mustard "*Moutarde de Dijon*" or cheese "*Gouda*", it will not be subject to the European rules on quality schemes. Both producers of PGI and PDO from EU and non-EU may benefit from the schemes. An example of foreign products is Turkish baklava (*Antep Baklavasi*, PGI) manufactured around the city of Gaziantep or Darjeeling black tea (PGI).

As follows from the Article 5 of the Regulation 1151/2012 on Quality Schemes, which establishes positive criteria for qualification regarding the quality and manner of production, PDO represents a sub-category of PGIs. To qualify a PDO, the product's quality of characteristics must essentially or exclusively derive from the geographical environment, with its inherent natural or human factors. By contrast, to be protected as a PGI, the quality or characteristics must essentially be attributable to the geographical origin, without a reference to the impact of the environment on the quality. Regarding the manner of production, for a PDO to be granted, all production steps should occur in the designated place of origin, whereas for a PGI, at least one production step must take place in the selected area. Therefore, PDO imposes stringent requirements, which are elaborated in product specifications.

4 Commission Regulation (EC) No 1829/2002 amending the Annex to Regulation (EC) No 1107/96 with regard to the name „Feta", OJ 2002 L 2894/14.

Unlike PDO and PGI, which represent quality labels, European Union trade mark (EUTM) is a branding tool which requires a single application, produces effects throughout the EU, and may be registered as individual or as a collective trade mark. Unlike individual trade mark, which can not describe the place of origin of foodstuffs, collective trademark may designate the geographical origin. The collective EUTM is granted if the products of the members of an association EUTM proprietor), may be differentiated from those of competitors. As the owner of a collective EUTM, the association can not prevent any third party to become its member, use the protected name or sign, if this is in line with honest practices in commercial, notably when the incumbent is entitled to use the geographical name on the basis of a registered PGI or PDO and which produces a product in compliance with the product specifications. For example, EUTM "*Genuine Bavarian Beer*" is owned by the association *Bayericher Brauerbund e.V*, which cannot prevent any third party to use the terms *Bavaria* or *Bavarian* as a part of the beer title, if they produce beer in line with the stipulated conditions.

At the EU level, several regulations and directives deal with various aspects of food labelling. While vertical labelling rules apply to specific products, Since 13 December 2016, when the obligations specified in the new Regulation 1169/2011 on the provision of food information to consumers became applicable, horizontal obligations to provide information is improved and rules preventing mislead practices are strengthened (Mahi, Conte-Salinas, 2016). The new EU law on food labelling, *inter alia*, specified mandatory origin information for fresh, chilled and frozen meat from pigs, sheep, goats and poultry. It also applies in cases when failure to indicate the country of origin might mislead the consumer, or in situations when the country of origin is given on a voluntarily basis but the origin of the primary ingredient is not the same as that of the food product. It should be underlined that even before the adoption of this regulation, country of origin labelling was already mandatory for honey, fruit and vegetables, olive oil, fishery and aquaculture products and beef, as stipulated in legislation regulating production of these specific products.

The concept of 'country of origin' of the food is determined in accordance with Articles 23 to 26 of Council Regulation 2913/92 of 12 October 1992 establishing the Community Customs Code ("Official Journal of the EU", no. L302). *Stricto sensu*, this refers to the country in which the product is wholly obtained, i.e. the animal was born, reared and slaughtered. However, in modern food chains several countries could be involved in food production, and this concept often refers to a country where the products have undergone last substantial processing. It was concluded that this would not sufficiently inform the consumers about meat origin, and it was considered necessary to inform them about the country where the animal has been reared for a substantial period. To ensure the traceability from slaughtering to packaging the Commission subsequently adopted an Implementing Regulation 1137/2013 of 13 December 2013 as regards the indication of the country of origin or place of provenance for fresh, chilled and frozen meat of the above animals ("Official Journal of the EU" no. L335) applicable as of April 2015, which regulates in a more detail the indication of the place of rearing

and slaughter. For example, sausages made in Germany using Hungarian pork can still be labeled as "German". In May 2018, the Commission has issued Implementing Regulation 2018/775 laying down rules for indicating the country of origin or place of provenance of the primary ingredient of a food ("Official Journal of the EU" no. L131).

Proliferation of national country of origin labelling schemes

The new EU Regulation on food information provided a way for individual Member States to enact mandatory rules and impose measures on the on the country of origin, which require food producers to indicate the country of origin of food placed on Member States' market, should there be a proven link between certain qualities of the food and its origin or provenance (Article 39). However, EU agriculture ministers are divided about the impact of national mandatory rules. After Belgian minister has documented the fall in exports of diary and meet, the Dutch, German, Luxembourg and Czech representatives voiced concerns over distortion of the single market, in favour of voluntary labelling schemes (GAIN, 2017). These countries blamed the European Commission for authorizing the French pilot project, which inspired some Member States to establish similar schemes.[5] Namely, France has been approved a two-year trial scheme (January 1, 2017- December 31, 2018) to assess consumers' preparedness to pay more for certain origins. For products containing more than 8 percent meat, the label must indicate the place of birth, raising and slaughter of used animals, whereas for products containing more than 50 percent milk, it must indicate the "country of collection" as well as the "country of transformation." When collection or production takes place outside France, the label may state the origin as "EU" or "non-EU." Italian law on the labeling of origin of dairy products such as milk, yoghurt, cheese and butter, in force as of April 19, 2017, specified a mandatory indication of the "country of milking" as well as the "country of processing" on dairy product labels.

The more stringent form of protectionism is the adoption of "local food" laws, which extend the labelling requirement to supermarkets and impose several duties in relation to the quantity of domestic products sold by supermarkets. For example, in 2011 Slovenia adopted a special law on promotion of agricultural and food products (*Zakon o promociji kmetijskih in živilskih proizvodov*, Official Journal of the Republic of Slovenia no. 26/11 and 57/12). It introduced "generic promotion" measures, to assure general information on production and advantages of certain products and quality schemes and voluntary labels. Early in 2017, the European Commission sent letters of formal notice to Hungary and Romania related to similar laws stating that both countries failed to submit evidence that national measures are justified and proportionate (Commission, 2017). Hungarian

5 Until July 2017, eight Member States introduced mandatory COOL for certain products: France (milk, milk and meat used as an ingredient), Italy (milk and milk used in dairy products, durum wheat and semolina in pasta, rice), Lithuania (milk and milk used in dairy products), Portugal (milk and milk used in dairy products), Romania (milk and dairy products), Greece (milk and milk used in dairy products, rabbit meat), Finland (milk, milk and meat used as an ingredient) and Spain (milk and dairy products).

new law obliges retailers to apply the same profit margins to domestic and imported agricultural and food products, despite the fact that the cost of imported products is subject to currency and exchange rate fluctuations. In Romania, large retailers are required to purchase at least 51% of food and agricultural products from local producers and the new law also requires retailers to promote products of Romanian origin.

Materials and methods

Given that the overarching objective of this paper is to provide both the overview of the legal framework on food origin labeling in the EU as a normative barrier to marketing practices, and its impact on Serbia's obligations in terms of the processes accession to the EU, the comparative legal method was predominantly used. The inductive method is applied in the analysis of legitimate or illegitimate practices of the EU Member States. A qualitative research applied in this paper is primarily related to landmark cases of the Court of Justice of the EU (CJ) and important national country of origin labelling schemes. The main legislative sources addressed in this text are Regulation 1169/2011 of the European Parliament and of the Council of 25 October 2011 on the provision of food information to consumers ("Official Journal of the EU" no. L304) with its implementing act on origin labelling, and Regulation 1144/2014 of the European Parliament and of the Council of 22 October 2014 on information provision and promotion measures concerning agricultural products implemented in the internal market and in third countries ("Official Journal of the EU" no. L317). Additionally, in order to present the scope of the tools of protection of the origin of foodstuffs in the EU, it was necessary to provide a brief overview of the two systems of intellectual property tools. Regulation 1151/2012 of the European Parliament and of the Council of 21 November 2012 on quality schemes for agricultural products and foodstuffs ("Official Journal of the EU" no. L343) introduced the three quality schemes of quality regulation with a significant impact on origin labeling, whereas Regulation 2017/1001 of the European Parliament and of the Council of 14 June 2017 on the European Union trade mark ("Official Journal of the EU" no. L154) allows the registration of collective trademarks containing geographical names.

Exploration of the theoretical approaches on causes, effects and the legitimacy of national consumer ethnocentric campaigns related to foodstuffs, reasoning of the Court of Justice and the framework of national and notably EU legislation represents a basis for a policy analysis. The goal of the descriptive analysis is to examine and evaluate the available options for Serbia and other countries which applied for the EU membership. Such promotion tools must not have effects equivalent to quantitative restrictions on food import.

Results

The analysis of relevant EU rules on origin labelling and its promotion was necessary to understand recent trends. The result of the analysis is the conclusion that although the Court of Justice has already ruled against Irish and German labels promoting national products, after more than three decades Member States seems to be willing

challenge the doctrine. Indeed, the new EU legislation, presented in this paper, and introduction of mandatory indications of origin for some products have relaxed the strict regime. The analysis of voluntary information and promotion regimes, had shown that Member States, implemented national food trademarks (e.g. Poland, Italy). A number of initiatives have been launched in the new Member States to employ promotional and marketing techniques. Good examples are labels *Kiválo Magyar Élelmiszer* (*Quality Food from Hungary*) run by Agrármarketing Centrum in partnership with the Ministry of Agriculture or *Klasa značka* quality mark awarded by the Czech Ministry of Agriculture. In the course of accession negotiations, Croatia has launched "*Buy Croatian*" campaign. Organized under auspices of the Croatian Chamber of Commerce, the campaign runs since 1997, and is based on two labels "*Hrvatska kvaliteta*" and "*Izvorno hrvatsko*".

The comparative analysis has shown that recently introduced Serbian voluntary standard linked to geographic origin is a concept similar to the above national quality marks. Decree on the labeling of agricultural products and foodstuffs with national quality label "*Serbian Quality*" ("Official Journal of the RS", no. 90/2016) is both a quality mark and a mean of promotion of origin. The overall result of this analysis is the conclusion that Serbia may introduce mandatory and voluntary labelling schemes, and a recommendation that Serbian Chamber of Commerce should engage in promotional campaigns which should not be subsidized by the State.

Discussions

The Stabilisation and Association Agreement between the European Communities and their Member States on the one part, and the Republic of Serbia on the other part – SAA ("Official Journal of the RS– International Contracts" no. 83/2008) obliges State bodies and local administration to deliberately avoid breaching the commitments taken under this agreement. Given the importance of agriculture and food industry for EU, its member states and candidate countries, a number of provisions specify duties and concessions of signatories in relation to agricultural goods, fisheries and processed products. Rules on the free movement of goods aim to eliminate customs duties and charges having equivalent effect imposed in connection with the importation or exportation of goods (SAA, Art. 18), as the signatories pledge to abolish all quantitative restrictions and measures having equivalent effects (SAA, Art. 26, 27, 29, 30). From the date of entry into force of the SAA, no such restrictions shall be introduced, nor shall those already applied be increased, in trade between the Community and Serbia (SAA, Art. 36).

Serbia has also committed to provide protection for the geographical indications and designations of origin for agricultural products and foodstuffs (SAA, Art. 33). For the purpose of implementing the SAA, a special Protocol No. 3. to the Agreement stipulates the principle of territoriality and lays detailed preconditions for a product to be considered as originating from the Community or Serbia, whether wholly obtained or sufficiently worked or processed (in line with the conditions set out in the Annex II). It would be

worth to mention that under certain circumstances, the SAA provides for a safeguard clause if imports subject of concession in relation to agricultural products could cause serious disturbance to the markets or domestic regulatory mechanisms (Art. 32) or authorizes prohibitions or restrictions "justified on grounds of public morality, public policy or public security; the protection of health and life of humans, animals or plants… Such prohibitions or restrictions shall not, however, constitute a means of arbitrary discrimination or a disguised restriction on trade between the Parties." (SAA, Art. 45).

In addition to the horizontal regime established by Serbian Law on Indications of Geographic Origin ("Official Journal of the RS" no. 18/2010) laws related to wine, spirit drinks and rakija contain special provisions on geographical indications. The relevant legislation specifies the conditions for granting the status of protected indications, procedure for registration and the protection of a right of a holder (Miladinović, Varga, 2011). Overall, the legal framework on geographical indications of food products is partially aligned with the EU *acquis*. Further strengthening of the legal framework and the implementation of quality policy in agriculture, as the subject matter of Chapter 11 – Agriculture and Rural Development,[6] represents a minor portion of Serbia's commitments to align its legislation and upgrade administrative capacities required by the *acquis* in this area.

The Law on Agriculture and Rural Development ("Official Journal of the RS" nos. 41/2009, 10/2013 – other law and 101/2016) envisaged that the agricultural policy of Serbia is defined by the Strategy for Agriculture and Rural Development ("Official Journal of the RS", no. 85/2014), the National Programme for Agriculture and the National Programme for Rural Development. As an umbrella document, this Strategy for the period 2014 to 2024 recognized, within one of its priority areas, strengthening the quality assurance policy to enhance the competitiveness of the agro-food sector, and promotion of local products. However, there are no specific indications on initiatives to enhance origin labeling and branding.

Serbian legal framework on obligatory declaration and nutritive information about foodstuff is mostly harmonized with the EU law. However, the labelling of products with nutrition and health claims faces a high level of consumers' skepticism (Stojanović et al., 2010). Article 26 of the Ordinance on the declaration, labeling and advertising of food ("Official Journal of the RS" no. 19/2017, 16/2018) specified products for which the country or country and place of origin must be indicated on the declaration. This is the case for pork, sheep and goat meat, poultry and beef meat and products, honey, vegetables and fruit, fish and products of fishery, eggs and egg products.

On the basis of the Serbian Law on Indications of Geographic Origin something over fifty domestic appellations of geographic origin were protected. Almost half of the protected appelations are agricultural products (Užice ham, Linden honey from Fruška

6 Screening Report for Chapter 11 – Agriculture and Rural Development (Ch. III (d), p. 18) specified that "Further alignment needs to be achieved and the implementation of the quality policy further strengthened."

Gora, pickled cabbage from Futog etc.), cheese products are second largest cathegory with around 21% (Zlatar cheese, Sombor cheese etc.), followed by wine (around 17%) and lastly, mineral water (Jovićević Simin et al., 2016). An appelation of geographical origin is a part of the marketing strategy which contributes to the competitiveness of domestic products. It represents both the object of promotion and a tool of promotion.

The Decree on the labeling of agricultural products and foodstuffs with national quality label "*Serbian Quality*" (Official Journal of the RS, no. 90/2016) specified the process of quality control of products with specific characteristics which could be awarded the label. Characteristics may relate to physical, chemical, microbiological and organoleptic properties of the product, methods of production or the specific conditions that must be met during its production. Up to now, granted labels are almost exclusively reserved for processed meat products. "*Serbian Quality*" is a voluntary quality standard, which is reserved for quality food produced of raw material originating from Serbia. It would be worth to say that this label, as well as indications of geographic origin, is not considered to represent a mark of special characteristics, a subject matter of the Article 39 of the Law on Trade (Official Journal of the RS, no. 53/2010, 10/2013).

Conclusion

Geographic origin of agricultural products and foodstuff is developing into a value driver in the EU and the global market place. In the aftermath of several food scandals, geographic origin is also seen as an appropriate instrument to tackle food safety issues. Within the framework established by Regulation 1144/2014 on information provision and promotion measures, as a third country Serbia and its food market is a target of three simple programmes co-financed by the EU covering the following: meat preparations, dairy products and olive oil.[7] This brings the issue on national campaigns of Serbian products to the forefront. The Republic of Serbia is a net exporter of agricultural products and processed food. Agricultural trade significantly contributes to the stabilization of the balance of payment and national competitiveness. After the entry into force of the SAA and liberalization of trade in foodstuff with the EU and CEFTA countries, followed with broadening of the network of wholesalers and supermarkets, which distribute imported agricultural products and food to Serbian consumers, the initiative on national country of origin labelling and promotion of domestic products within the territory of Serbia becomes important.

Recommendations

The existing pool of marketable products with protected geographic indications and designations of origin, complemented with the new quality scheme "*Serbian quality*", should be enriched with well-designed and coordinated measures promoting Serbia as country of origin, especially for certain types of strategically important Serbian agricultural products and foodstuffs. A number of possible options within the

7 https://ec.europa.eu/chafea/agri/campaigns/map-and-statistics-target-countries

framework of national country of origin labelling schemes should be considered as viable alternatives. In order for it to be in line with Serbian commitments undertaken by signing the SAA and accession negotiations, direct sponsoring of national campaigns by the State should be avoided.

Since 2004, Serbian Chamber of Commerce, in cooperation with the Ministry of trade, tourism and telecommunications, organizes a competition for the most successful trade and corporative brands and exporters „Best from Serbia" (*Najbolje iz Srbije*). We recommend that Serbian Chamber of Commerce extends the promotional campaign to popularize voluntary origin labelling, similar to the activities of the Croatian Chamber of Commerce.

Conflict of interests

The authors declare no conflict of interest.

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Obituaries

Professor Danilo Tomić, Ph. D.
November 08, 1945 – August 26, 2018

Professor Danilo Tomić was born in the village of Šušeoka, District of Valjevo's Kolubara (Republic of Serbia). After studying agriculture at the Faculty of Agriculture, University of Novi Sad (1973-1977), he obtained Ph.D. in 1984 at the same University. The title of his thesis was "The Theory and Practice of the Development of Agriculture in ex-Yugoslavia". He specialized in the field of Agriculture first at the Institute of Social Sciences in the Hague, Holland, then at the State University in Ohio, USA, and at Eurochambers in Brussels, Bergen, Ljubljana, Dubrovnik. During his fruitful career he was Director of the Institute of Agricultural Economics in Belgrade, vice President of Novi Sad Chamber of Commerce, and Professor at Novi Sad School of Business.

His field of specialization was Agricultural Economics and Rural Development. He was an expert in Agricultural and Rural Development in ex-Yugoslavia as well a member of the Serbian Academy of Science Committee for Rural Development.

Professor Tomić was active in international scientific circles and he was one of the most significant authors who dealt with knowledge transfer in ex-Yugoslavia and the Republic of Serbia. He was a member of the European Association of Agricultural Economics (EAAE), International Association of Agricultural Economics (IAAE) and American Association of Agricultural Economics (AAEA) from 1981. He participated in eight European and six world congresses as well a number of EAAE seminars. He also organized several EAAE seminars in ex-Yugoslavia and Serbia (63rd, 100th, 113th and 135th). Also he participated in the first US–Chinese Congress of Agricultural Economists in Beijing in 1992, in the first American–Canadian Congress of Agricultural Economists in 1997 held in Toronto, and two American Congresses of Agricultural Economists in 1987 in Clivlend and 1988 in Noksvil.

Professor Tomić published on its own and together with other domestic and foreign authors round 400 scientific and professional papers in domestic publications and more than 40 papers in international publications. In his research he was dealing with problems of world agriculture, especially agriculture of EU countries, countries in transition

as well as with problems of agriculture in ex-Yugoslavia, the Republic of Serbia and the Autonomous Province of Vojvodina. In his work he studied various aspects of agricultural development, mostly conceptual problems of agriculture and rural development. Danilo Tomić was also a successor of Novi Sad Creative Agronomic School whose professors had been his role models during his studies.

Professor Danilo Tomić will be remembered as one of the most active members of Serbian Academy of Sciences Committee for Rural Development. After he passed away on August 26, 2018 we will misses his ideas, creative criticism and vivid spirit he always radiated.

2018-09-11 Novi Sad

Zoran Njegovan, Ph.D., Full Professor
Faculty of Agriculture
University of Novi Sad

In memoriam

Професор др Данило-Дача Томић, научни саветник

08. новембер 1945 – 26. август 2018.

Професор др Данило-Дача Томић је рођен у селу Шушеока, у Ваљевској Колубари. (Република Србија). Након основног и средњег образовања, радио је на пољопривредном добру „Језеро“, Ново Милешево (Банат, АП Војводина). Пољопривредни факултет Универзитета у Новом Саду завршава 1977. године где и докторира 1984. Наслов докторске дисертације је: "*Теорија и пракса развоја пољопривреде Југославије*". Био је први студент проректор Универзитета у Новом Саду, а такође и у Србији.

Усавршавао се у земљи и иностранству. Вредно је помена његово усавршавање у Институту друштвених наука у Хагу (Холандија), на Државном Универзитету у Охају (УСА), и Еурокомори Брисел, Берген, Љубљана, Дубровник. Његово пољеспецијализације и интересовања је углавном била економика пољопривреде и рурални развој. Бавио се проблемима светске пољопривреде, а посебно пољопривредом земаља Европске уније, земаља у транзицији, као и проблемима пољопривреде ex-Југославије, Србије и Војводине. Сарађивао је са истраживачима разних образовних профила, агрономима, економистима, агроекономистима, социолозима, технолозима, статистичарима, итд.

Током своје дуге и плодне каријере, Дача је био директор Института за економику пољопривреде у Београду, потпретседник Новосадске коморе, професор на вишој/високој пословној школи у Новом Саду. Такође, био је владин експерт за пољопривредни и рурални развој у екс-Југославији, и члан одбора за село Српске академије наука и уметности (САНУ).

Оно што га је посебно красило и у чему је био без премца, јесте жеља и способност да повезује људе и институције, и стално унапређује науку и струку. Због тога је био веома активан у међународној научној сарадњи, желећи да домаћој науци и струци донесе, приближи и трансферише најновија знања и искуства. Био је члан Европске асоцијације аграрних економиста (EAAE), Светске асоцијације аграрних економиста (ИААЕ) и Америчке асоцијације аграрних

економиста (AAEA) од 1981. године. У екс-Југославији и Србији је организовао чак четири семинара Европске асоцијације аграрних економиста, а поред тога, организовао је и бројне домаће научне симпозијуме и конференције.

Данило Томић је самостално или у коауторству са колегама публиковао око 450 радова од чега око 40 у међународним публикацијама. Бавећи се концептуалним проблемима економике пољопривреде и руралног развоја, може се рећи да је био један од најистакнутијих представника неформалне, тзв. новосадске пољопривредне школе.

Данило Томић је цео свој радни век био веома активан али и после тога. Биће упамћен и као један од најактивнијих чланова одбора за село Српске академије наука и уметности.

Након што је преминуо 26. августа 2018. године, аграрној науци и струци у Србији ће недостајати његове идеје, његов креативни критицизам и изнад свега, његов ведри дух.

У Новом Саду, 11. септембра 2018. године

Проф. др Зоран Његован, редовни професор
Пољопривредни факултет
Универзитет у Новом Саду

MINUTES
of the 10th (tenth) regular annual session of the Assembly BALKAN SCIENTIFIC ASSOCIATION OF AGRICULTURAL ECONOMISTS (BSAAE) held on March 26, 2018 in Belgrade, in the Chamber of Commerce of Belgrade, Kneza Miloša Street 12, at the Mezanin Hall, starting at 13:00

The session of the Assembly of the BALKAN SCIENTIFIC ASSOCIATION OF AGRICULTURAL ECONOMISTS was opened by prof. Radovan Pejanović, President of the BSAAE, which proposed the following agenda:

1. Selection of working bodies of the Assembly.

2. Approval of the minutes of the 9th regular annual meeting of the BSAAE Assembly.

3. The BSAAE Work Report for 2017

4. Review and adoption of the Financial Statement for 2017

5. The BSAAE Activity Plan for 2018

6. Miscellaneous.

The agenda was unanimously adopted.

1. Selection of working bodies of the Assembly.

1.1. The candidates nominated for a member of the working presidency of the BSAAE Assembly:

* prof. Dr Drago Cvijanović
* prof. Dr. Zorica Vasiljević

1.2. The candidate nominated for the recording secretary of the BSAAE Assembly:

* Dr. Gordana Radović

1.3. The candidates nominated for the verification of the minutes of the BSAAE Assembly:

* prof. dr Svetlana Vukotić
* prof. Dr. Rajko Tepavac

All proposals were unanimously accepted.

2. Approval of the minutes of the 9th regular annual meeting of the BSAAE Assembly.

The President of the BSAAE, prof. Dr Radovan Pejanović, put the minutes of the 9th regular annual session of the BSAAE Assembly to the vote, and it was adopted unanimously.

3. The BSAAE Work Report for 2017

The President of the BSAAE, prof. Dr Radovan Pejanović, submitted the report on the work of the BSAAE for 2017, and on this occasion he especially emphasized:

A) in 2017, all four planned scientific journals *The Economics of Agriculture* were published, with a total of 103 papers, of which 94 domestic and 9 authors from abroad, and all papers were published in English language:
* number 1/2017 contains 23 papers, all authors are from the Republic of Serbia;
* number 2/2017 contains 26 papers, 23 by domestic and 3 by authors from abroad;
* number 3/2017 contains 27 papers, 26 by domestic and 1 by an author from abroad;
* number 4/2017 contains 27 works, 22 by domestic and 5 by authors from abroad.

B) Editor-in-Chief of *The Economics of Agriculture*, prof. Dr Drago Cvijanović was informed on 14th February 2018 that journal *The Economics of Agriculture (Ekonomika poljoprivrede*), was listed on the Emerging Sources Citations Index (ESCI).

C) In 2017, the BSAAE co-organized the following conferences:
- International scientific conference "TOURISM IN THE FUNCTION OF DEVELOPMENT OF THE REPUBLIC OF SERBIA" - Tourism product as a factor of competitiveness of the economy of Serbia and experiences of other countries" held from 01 to 03 June 2017 in Vrnjacka Banja;
- VIII International Agricultural Symposium "AGROSYM 2017" held at Jahorina from 05 to 08 October 2017;
- Scientific conferences "SUSTAINABLE AGRICULTURE AND RURAL DEVELOPMENT IN THE FUNCTION OF ACHIEVING STRATEGIC GOALS OF THE REPUBLIC OF SERBIA IN THE DANUBE REGION - Programs for Supporting the Development of Agriculture and the Village" held on December 14-15, 2017 in the Serbian Chamber of Commerce;
- Scientific - professional symposium "BEER AND BEER HOP INDUSTRY", which was held in Zrenjanin from 28 to 30 August 2017.

D) In 2017, the BSAAE published the following monograph:
* Ivan D. Mičić, Zoran N. Rajić, Ivana I. Mičić (2017): Strategic Risk

and Payments in Electronic Banking, Balkan Scientific Association of Agricultural Economists, UDC 005.334: [336.71:004]; ISBN 978-86-82923-15-2 1; COBISS.SR-ID 252550924.

E) In 2017, the BSAAE realized cooperation with individual faculties, institutes (in the country and abroad), the Agricultural Development Academy of Serbia, local communities and individuals, thus contributing to the scientific and professional influence of the BSAAE and the scientific journal "Economics of Agriculture".

Following the presentation of the BSAAE Work Report for 2017, a discussion was opened.

Prof. Drago Cvijanović, PhD: The fact that *The Economics of Agriculture* was included in the Emerging Sources Citations Index (ESCI) is an enormous success. However, this is also a great responsibility and it requires the publication of high-quality works in order to keep our journal progressing. Technical modifications of journals and the site are also needed, and for all this, additional financial resources are needed. He proposes a fee increase for the publication of works, and that in the future they are paid by authors from abroad, who have not paid so far. Also, we need to attract as many authors from abroad as possible to publish works in the "Economics of Agriculture", as well as to increase the papers' citation. He reminded that the next year is electional for the BSAAE.

Prof. Zoran Njegovan, PhD: He believes that the fact that *The Economics of Agriculture* is listes on the Emerging Sources Citations Index (ESCI) is a great success and suggests that this success be noted in this record and also noted as an important historical fact.

Prof. Radovan Pejanović, PhD: He points out the success that the journal made on its way to the SCI list, stressing the great struggle that accompanied it. He notes that the BSAAE should not organize conferences and symposiums independently, but solely as a co-organizer, as the organization requires large financial resources, which are difficult to obtain.

Prof. Zorica Vasiljević, PhD: She proposes that the BSAAE sessions be organized during the symposium and conferences, of which we are co-organizers, in order to ensure participation of colleagues from abroad who are members of the BSAAE.

After the discussion, the President of the Assembly put the BSAAE Work Report for the year 2017, which was unanimously adopted.

4. Reviewing and adoption of the Financial Report for 2017

The President of the BSAAE, prof. Radovan Pejanović and Editor-in-Chief of the Journal of *The Economics of Agriculture*, prof. Drago Cvijanović, submitted the

Financial Report of the BSAAE for 2017 (which is also an integral part of the minutes) and on that occasion emphasized:

A) In 2017, the BSAAE achieved:

- total income:1.421.754,24 RSD;
- total expenses: 1.410.099,07 RSD;
- net profit: 11.655,17 RSD.

B) Income structure:

- membership fees: RSD 129,000.00;
- donation income: 160,000.00 RSD;
- income from services: 1.132.409,00 RSD;
- Foreign exchange differences: 245.24 RSD.

C) Expenditure Structure:

- costs of office and other consumables: 2,045.00 RSD;
- fee and work contracts (technical editor, proofreader, proofreader and press preparation): 612,975.66 RSD;
- printing costs: 644.284,00 RSD;
- bookkeeping services: 87.000,00 RSD;
- PTT services: 49.516,00 RSD;
- commission fee, National Library fee: 9,038.38 RSD;
- representation costs: 2.500,00 RSD;
- taxi service costs: 1.300,00 RSD.

After the presentation of the BSAAE Financial Report for 2017, a discussion was opened.

Prof. Drago Cvijanović, PhD suggests that from 2018 onward, if financial possibilities arise, a fee for the work of reviewers and editor-in-chief of the jounal *The Economics of Agriculture* could be paid, as well as that there should be an increase in the fee paid to the technical editor. He points out that in 2017, the publication of the issue of *The Economics of Agriculture* was not delayed, and that this is especially appreciated for the SCI list. The journal is indexed in 12 databases (CEON, SCI index, ...)

Prof. Zoran Njegovan, PhD asks whether the regime and deadlines for the submission of papers are changing in the future or whether they remain as they have been up to now.

Prof. Drago Cvijanović, PhD emphasizes that the problem is the tardiness of the reviewers. The new program will remind reviewers to be up to date. He requests that he be authorized to speak to Lazar Stošić and to define the deadlines for the delivery of papers and the number of papers between the journal issues.

Prof. Gorica Cvijanović, PhD notes that according to the Rulebook of the Ministry of Science, the journals that have been upgraded allocate more points to a scientific work that was published in two previous years or is to be published in the following year.

Prof. Radovan Pejanović, PhD emphasizes that it is necessary to preserve the rank of the journal *The Economics of Agriculture*. For this purpose, it is necessary to work on publishing the highest quality papers, which requires reviewers to do their job in the best possible way. He supports the introduction of fees for reviewers, the editor-in-chief of the journal, as well as the increase in fees for the technical editor, and if the members of the Assembly agree, the increase of the participation in the publication of papers in the journal *The Economics of Agriculture*.

Prof. Zoran Njegovan, PhD points out that it is necessary to give instructions to reviewers in order to increase their responsibility, which is already a practice in some journals.

Prof. Zorica Vasiljević, PhD asks if the papers go through plagiarism detection software. Reviewers cannot be expected to deal with plagiarism.

Prof. Radovan Pejanović, Ph.D. believes that it is necessary to appeal to the responsibility of the reviewers as well.

Prof. Zoran Njegovan Ph.D. emphasizes the role of the editor-in-chief of the journal and cites an example that abroad it is possible for one paper to receive two negative reviews, but that the editor, however, estimates that it needs to be published.

Prof. Radovan Pejanović, PhD. pointed out that the Financial Report was accepted in the Serbian Business Registers Agency (SBRA), and that the BSAAE did positively, but that some funds need to be found and paid to the people who are most responsible. He suggests that the BSAAE Assembly determines how realistic it is to increase the participation in the publication of works in *The Economic of Agriculture* with the Presidency of the BSAAE, as well as to determine the compensation for the work of the most responsible people. In other words, to look into the possibility to increase participation for publication of papers, as well as to increase the membership in the BSAAE, but also to define the amount of the reviewers' and the editor-in-chief's fees, and to increase the fee for the work of the technical editor of the journal.

After the discussion, the President of the BSAAE put to the vote:

- the BSAAE financial report for 2017, and
- Recommendation to the Presidency of the BSAAE to increase the annual membership fee in the BSAAE from 1.500,00 to 3.000,00 dinars, and the participation in the publication of the paper *The Economic of Agriculture* (*Ekonomika Poljoprivrede*) from 15.000,00 RSD to 25.000,00 RSD,

Both proposals were unanimously adopted.

5. The BSAAE Activity Plan for 2018

President of BSAAE, prof. Radovan Pejanović, presented the Work Plan of the BALKAN SCIENTIFIC ASSOCIATION OF AGRICULTURAL ECONOMISTS in 2018, and on that occasion emphasized:

- it is necessary to continue the work on increasing the quality and positioning of the journal *The Economics of Agriculture*;
- publish four regular issues of the journal and possibly some extraordinary

thematic number of the journal *The Economics of Agriculture* (in English);
- organize scientific and professional meetings;
- publish appropriate monographs as a publisher;
- foster cooperation with other scientific institutions;
- work continuously to strengthen the scientific and professional impact of the BSAAE, as well as the journal *The Economics of Agriculture*.

Prof. Dr. Radovan Pejanović suggested that the BSAAE Assembly meetings be held as needed, in accordance with financial circumstances, while the possibility of making urgent decisions will be possible by telephone or electronic means.

There was no discussion, and the President of the Assembly put the BSAAE's Work Plan in 2018 to the vote, which was unanimously adopted.

6. Miscellaneous.

Prof. Svetlana Vukotić, PhD asked whether there is a possibility for admission of new members.

Prof. Radovan Pejanović, PhD believes that it would be a good thing to establish cooperation with agricultural faculties in the region.

Prof. Radovan Pejanović, PhD recalls that there was a proposal to create a special department of the BSAAE in Bucharest, but that this requires a change in the Statute, and the question is whether this could be done according to our law. He thinks it would be good to write a letter to the institutions in the region where they would be invited to be members of the BSAAE, or their associates.

Prof. Zorica Vasiljević, PhD said that it would be a good idea to inform the participants of scientific meetings about the work of the BSAAE and to propose membership.

Prof. Svetlana Vukotić, PhD believes that it is necessary to promote journal *The Economics of Agriculture*, since few journals in the region are of such tradition and quality.

The President of the BSAAE, prof. Radovan Pejanović, thanked for the constructive proposals and concluded the session of the Assembly at 14:15 pm.

In Belgrade, March 26, 2018

Minutes verification secretaries:
prof. dr Svetlana Vukotić
prof. Dr. Rajko Tepavac

Recording Secretary:
dr Gordana Radović

ЗАПИСНИК
са 10. (десете) редовне годишње седнице Скупштине НАУЧНОГ ДРУШТВА АГРАРНИХ ЕКОНОМИСТА БАЛКАНА (НДАЕБ) одржане 26.03.2018. године

у Београду, у Привредној комори Београд, улица Кнеза Милоша 12, у сали Мезанин на међуспрату са почетком у 13:00 часова

Седницу Скупштине Научног друштва аграрних економиста Балкана је отворио проф. др Радован Пејановић, председник НДАЕБ, и предложио следећи дневни ред:

1. Избор радних тела Скупштине.

2. Усвајање записника са 9. редовне годишње седнице Скупштине НДАЕБ.

3. Извештај о раду НДАЕБ за 2017. годину.

4. Разматрање и усвајање Финансијског извештаја за 2017. годину.

5. План активности НДАЕБ-а за 2018. годину.

6. Разно.

Дневни ред је једногласно усвојен.

1. Избор радних тела Скупштине.

1.1. За члана радног председништва Скупштине НДАЕБ-а предложени су:

* проф. др Драго Цвијановић
* проф. др Зорица Васиљевић

1.2. За записничара Скупштине НДАЕБ-а је предложена:

* др Гордана Радовић

1.3. За оверивача записника Скупштине НДАЕБ-а предложени су:

* проф. др Светлана Вукотић
* проф. др Рајко Тепавац

Сви предлози су једногласно прихваћени.

2. Усвајање записника са 9. редовне годишње седнице Скупштине НДАЕБ.

Председник НДАЕБ-а, проф. др Радован Пејановић, је ставио на гласање записник са 9. редовне годишње седнице Скупштине НДАЕБ-а, који је једногласно усвојен.

3. Извештај о раду НДАЕБ за 2017. годину.

Председник НДАЕБ-а, проф. др Радован Пејановић, је поднео Извештај о раду НДАЕБ- а за 2017. годину и том приликом посебно нагласио:

(А) у 2017. години су објављена сва четири планирана броја научног часописа „Економика пољопривреде“ са укупно 103 рада, од тога 94 домаћих и 9

аутора из иностранства, а сви радови су објављени на енглеском језику:

* број 1/2017 садржи 23 рада, сви аутори су из Републике Србије;
* број 2/2017 садржи 26 радова, 23 домаћих и 3 аутора из иностранства;
* број 3/2017 садржи 27 радова, од тога 26 домаћих и 1 рад аутора из иностранства;
* број 4/2017 садржи 27 радова, од тога 22 домаћих и 5 радова аутора из иностранства.

(Б) **главни и одговорни уредник „Економике пољопривреде“, проф. др Драго Цвијановић обавештен је дана 14.02.2018. године да је „Економика пољопривреде“ уврштена на листу Emerging Sources Citations Index (ESCI).**

(В) НДАЕБ је у 2017. години био суорганизатор следећих конференција:

- Међународне научне конференције „ТУРИЗАМ У ФУНКЦИЈИ РАЗВОЈА РЕПУБЛИКЕ СРБИЈЕ“ – Туристички производ као фактор конкурентности привреде Србије и искуства других земаља“ која је одржана од 01. до 03. јуна 2017. године у Врњачкој Бањи;
- VIII Међународног пољопривредног симпозијума „AGROSYM 2017“ који је одржан на Јахорини од 05. до 08. октобра 2017. године;
- Научне конференције „ОДРЖИВА ПОЉОПРИВРЕДА И РУРАЛНИ РАЗВОЈ У ФУНКЦИЈИ ОСТВАРИВАЊА СТРАТЕШКИХ ЦИЉЕВА РЕПУБЛИКЕ СРБИЈЕ У ОКВИРУ ДУНАВСКОГ РЕГИОНА – програми подршке унапређењу развоја пољопривреде и села“ који је одржан 14. и 15. децембра 2017. године у Привредној комори Србије;
- Научно – стручног симпозијума „ПИВО, ПИВАРСТВО И ХМЕЉАРСТВО“ који је одржан у Зрењанину од 28. до 30. августа 2017. године.

(Г) НДАЕБ је у 2017. години био издавач монографије:
* Иван Д. Мичић, Зоран Н. Рајић, Ивана И. Мичић (2017): *Стратешки ризик и плаћања у електронском банкарству*, Научно друштво аграрних економиста Балкана, УДК 005.334: [336.71:004]; ISBN 978-86-82923-15-2 1; COBISS.SR-ID 252550924.

(Д) НДАЕБ је током 2017. године реализовало сарадњу са појединим факултетима, институтима (у земљи и иностранству), Развојном академијом пољопривреде Србије (РАПС), локалним заједницама и појединцима, чиме је дат допринос научном и стручном утицају Научног друштва аграних економиста Балкана и научног часописа „Економика пољопривреде“.

Након презентовања Извештаја о раду НДАЕБ за 2017. годину отворена је дискусија.

Проф. др Драго Цвијановић: Велики је успех што је „Економика пољопривреде“ уврштена на листу *Emerging Sources Citations Index (ESCI)*. Међутим, то је и велика одговорност и захтева објављивање само квалитетних радова како би наш часопис и даље напредовао. Потребне су и техничке модификације часописа и сајта, а за све то су потребна и додатна финансијска средства. Предлаже да се повећа партиципација за објављивање радова, као и да је убудуће плаћају и аутори из иностранства, који је до сада нису плаћали. Такође, потребно је да привучемо што већи број аутора из иностранства, да објављују радове у „Економици пољопривреде“, као и да се повећа цитираност радова. Подсећа да је следећа година изборна за НДАЕБ.

Проф. др Зоран Његован: Сматра да је велики успех што је „Економика пољопривреде“ уврштена на листу *Emerging Sources Citations Index (ESCI)* и предлаже да се овај успех констатује и истакне у записнику како би то остало забележено као историјски податак.

Проф. др Радован Пејановић: Истиче да је велики успех што је часопис сачуван и „дигнут“ на путу ка *SCI listi*, јер је била велика борба. Напомиње да НДАЕБ не организује конференције и симпозијуме самостално, већ искључиво као суорганизатор, јер организација захтева велика финансијска средства, до којих је тешко доћи.

Проф. др Зорица Васиљевић: Предлаже да се седнице НДАЕБ организују у току одржавања симпозијума и конференција, чији смо суорганизатори, како бисмо обезбедили учешће и колега из иностранства који су чланови НДАЕБ-а.

Након закључене дискусије председник Скупштине је ставио на гласање Извештај о раду НДАЕБ-а за 2017. годину, који је једногласно усвојен.

4. Разматрање и усвајање Финансијског извештаја за 2017. годину.

Председник НДАЕБ, проф. Др Радован Пејановић и главни и одговорни уредник часописа Економика Пољопривреде, проф. др Драго Цвијановић, су поднели Финансијски извештај НДАЕБ-а за 2017. годину (који је и саставни део записника) и том приликом истакли:

(А) НДАЕБ је у 2017. години остварило:
- укупан приход у износу од 1.421.754,24 динара;
- укупан расход у износу од 1.410.099,07 динара;
- нето добитак у износу од 11.655,17 динара.

(Б) Структура прихода:
- приходи од чланарине: 129.000,00 динара;
- приходи од донације: 160.000,00 динара;
- приходи од услуга: 1.132.409,00 динара;
- остали приходи - курсна разлика: 245,24 динара.

(В) Структура расхода:

- трошкови канцеларијског и осталог потрошног материјала: 2.045,00 динара;
- накнада хонорара и уговора о делу (технички уредник, лектор, коректор и припрема за штампу): 612.975,66 динара;
- трошкови штампе: 644.284,00 динара;
- књиговодствене услуге: 87.000,00 динара;
- ПТТ услуге: 49.516,00 динара;
- провизија банке, накнада АПР-а и Народној библиотеци: 9.038,38 динара;
- трошкови репрезентације: 2.500,00 динара;
- трошкови такси услуга: 1.300,00 динара.

Након презентованог Финансијског извештаја НДАЕБ-а за 2017. годину отворена је дискусија.

Проф. др Драго Цвијановић, предлаже да се од 2018. године, ако се изнађу финансијске могућности, уведе плаћање накнаде за рад рецензената и главног и одговорног уредника часописа „Економика пољопривреде“, као и да се повећа накнада техничком уреднику. Истиче да се у 2017. години није каснило ни дан са објавом бројева часописа „Економика пољопривреде“, а то се посебно цени за *SCI listu.* Часопис се налази у 12 база података *(CEON, SCI index, ...)*

Проф. др Зоран Његован: Поставља питање да ли се убудуће мења режим и рокови достављања радова или остаје као и до сада?

Проф. др Драго Цвијановић: Напомиње да је посебан проблем неажурност рецензената. Нови програм ће „терати“ рецензенте да буду ажурни. Тражи да се он овласти да разговара са Лазаром Стошићем и да се дефинишу рокови за доставу радова и прављење пресека између часописа.

Проф. др Горица Цвијановић: Напомиње да се према Правилнику Министарства науке приликом бодовања научног рада, а код часописа који мењају категоризацију на више, признаје година испред и две године иза као већа категорија, односно носе и већи број бодова.

Проф. др Радован Пејановић: Истиче да је неопходно да се сачува постигнути ранг часописа „Економика пољопривреде“. У том циљу потребно је радити на објављивању што квалитетнијих радова, што захтева и да рецензенти што ваљаније обаве свој посао. Подржава увођење накнада за рецензенте, главног и одговорног уредника часописа, као и повећање накнаде техничком уреднику, а уколико се чланови Скупштине сложе и да се повећа партиципација за објаву радова у часопису „Економика пољопривреде“.

Проф. др Зоран Његован: Истиче да је потребно дати упутство рецензентима како би се повећала и њихова одговорност, а што је већ пракса код неких часописа._

Проф. др Зорица Васиљевић: Поставља питање да ли радови пролазе кроз софтвер за откривање плагијата? Рецензенти не могу водити рачуна о плагијатима.

Проф. др Радован Пејановић: Сматра да је ипак потребно апеловати и на

одговорност рецензената.

Проф. др Зоран Његован: Истиче улогу главног и одговорног уредника часописа и наводи пример да је у иностранству могуће и да рад добије две негативне рецензије, али да ипак уредник процени да га је потребно објавити.

Проф. др Радован Пејановић: Истиче да је Финансијски извештај је прихваћен у АПР-у, позитивно смо пословали, али потребно је да изнађемо могућност да се нека средства исплате људима који су најодговорнији. Предлаже да Скупштина НДАЕБ иницира код Председништва НДАЕБ-а да утврде, колико је реално, да се повећа партиципација за објаву радова у „Економици пољопривреде", као и да утврде накнаде за рад најодговорнијих људи. Односно, да се сагледа могућност за повећање партиципације за објаву радова, као и за повећање чланарине у НДАЕБ, али и за дефинисање висине накнада за рад рецензентима, главном и одговорном уреднику часописа, као и за повећање накнаде за рад техничком уреднику часописа.

Након закључене дискусије председник НДАЕБ-а, је ставио на гласање:
а) Финансијски извештај НДАЕБ-а за 2017. годину, и
б) Препоруку Председништву НДАЕБ-а, да се повећа годишња чланарина у НДАЕБ-а са 1.500,00 на 3.000,00 динара, и партиципације за објављивање рада у часопису „Економика Пољопривреде" са 15.000,00 динара на 25.000,00 динара, оба предлога су једногласно усвојена.

5. План активности НДАЕБ-а за 2018. годину.

Председник НДАЕБ-а, проф. др Радован Пејановић, је изложио План рада Научног друштва аграрних економиста Балкана у 2018. години и том приликом истакао:

– потребно је наставити рад на повећању квалитета и позиционирању часописа „Економика пољопривреде";
– објавити четири редовна броја часописа и евентуално неки ванредни тематски број часописа „Економика пољопривреде" (на енглеском језику);
– организовати научне и стручне скупове;
– објавити као издавач одговарајуће монографије;
– неговати сарадњу са другим научним институцијама;
– стално радити на јачању научног и стручног утицаја НДАЕБ, као и часописа „Економика пољопривреде".

Проф. др Радован Пејановић је и предложио да се састанци председништва НДАЕБ одржавају по потреби, у складу са финансијским могућностима, док ће за хитне одлуке важити могућност њиховог доношења телефонским или електронским путем.

Дискусије није било, те је председник Скупштине ставио на гласање План рада НДАЕБ-а у 2018. години, који је једногласно усвојен.

6. Разно.

Проф. др Светлана Вукотић: Поставила је питање да ли постоји могућност за пријем нових чланова.

Проф. др Радован Пејановић: Сматра да би било добро да се успостави сарадњу са пољопривредним факултетима у региону.

Проф. др Радован Пејановић: Подсећа да је постојао предлог да се у Букурешту направи посебно одељење НДАЕБ-а, али за то је потребна промена Статута, а и питање је да ли би се то могло реализовати према нашем закону. Сматра да би било добро да се напише писмо институцијама у региону где би се оне позвале да буду чланови НДАЕБ, односно њихови научни радници.

Проф. др Зорица Васиљевић: Сматра да би било добро да се на интеркатедарским сусретима учесници информишу о раду НДАЕБ-а и да се предложи чланство.

Проф. др Светлана Вукотић: Сматра да је потребно и маркетиншки испратити часопис „Економика пољопривреде“, јер је мало часописа у региону са таквом традицијом и квалитетом.

Председник НДАЕБ, проф. др Радован Пејановић, се захвалио на конструктивним предлозима и закључио седницу Скупштине у 14 часова и 15 минута.

У Београду, 26.03.2018. године

Оверивачи записника:
проф. др Светлана Вукотић
проф. др Рајко Тепавац

Записник водила:
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Original/Review Article

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The abstract should contain a maximum of 150 words. The abstracts should avoid any abbreviations and mathematical formulas.
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1. Purpose
2. Methodology
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Introduction

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Introduction is the first section of an IMRAD paper. It purposes is to state clearly the problem investigated and to provide the reader with relevant background information. State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.

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Sub-headings should be written by font **Times New Roman**, **font size 11**, **bold**, **centred**, only first letter capital, interspace between sub-heading and paragraph above 6 pt (**before 6 pt**), and interspace between sub-heading and paragraph below 6 pt (**after 6 pt**). Please use the writing style presented in this template.

Materials and methods

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For equations and formulas use the Microsoft Equation Editor or addition for equations writing MathType (www.mathtype.com). Use of built-in equation editor within the program Word 2007 is not recommended. Please check if all symbols within the equations/formulas are defined (forthwith after equation/formula). The equations are written using Microsoft Word (MathType); they are consecutively numbered and centered.

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The main conclusions of the study may be presented in a short Conclusions section, which may stand alone or form a subsection of a *Discussion* or *Results and Discussion* section. Conclusions should provide a summary of important findings and their implicants to the area of research that is the forms of the article.

Acknowledgements

Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.). They should be brief.

Conflict of interests

The authors declare no conflict of interest.

References

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3. Mićović, A. (2017). Tourism Development and Evolution of Tourism Related Rules, *2nd International Scientific Conference – Thematic Proceedings II*, Faculty of Hotel Management and Tourism, Vrnjačka Banja, 181-202. Retrieved from http://www.hit-vb.kg.ac.rs/conference/images/thematic_proceedings/2017_II.pdf
4. Stošić, L., & Stošić, I. (2013). Diffusion of innovation in modern school. *International Journal Of Cognitive Research In Science, Engineering And Education (IJCRSEE),* 1(1), 12-24.

5. Domanović, V., Vujičić, M., & Ristić, L. (2018), Profitability of food industry companies in the Republic of Serbia, *Economic of Agriculture*, 65(1), 11-32. doi:10.5937/ekoPolj1801011D
6. The Food and Agriculture Organization of the United Nations (FAO), Retrieved from http://www.fao.org (July 31, 2018)

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Example:

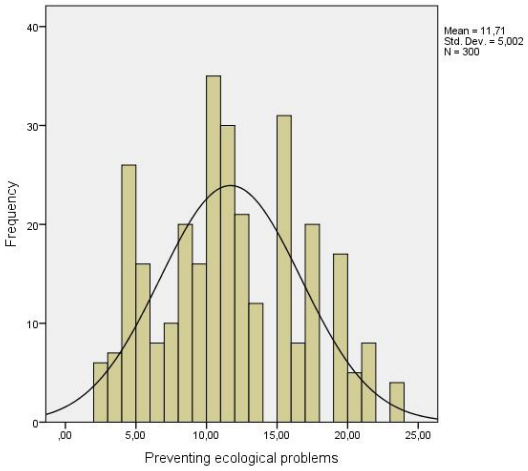
Table 1. The distribution cost of packaged goods from Subotica to retail-store objects

Indicators	Period			Total
	Month 1	Month 2	Month 3	
Distance crossed (km)	12.926	11.295	13.208	37.429
Fuel consumption (litre)	3.231	2.823	3.302	9.356
Value of fuel consumption (RSD)	242.378	211.790	247.653	701.821
Total time spend on touring (hour)	314	266	417	997
Value of total time spend on touring (RSD)	47.048	39.890	62.570	149.508
Number of tours	98	77	102	277
Toll value (RSD)	0	0	0	0
Number of pallets transported (piece)	1.179	976	1358	3.513
Total weight transported (kg)	602.600	429.225	711.116	1.742.941
Vehicle maintenance costs (RSD)	203.858	164.970	224.806	593.634
Lease costs (RSD)	480.938	454.214	565.784	1.500.936
Total sum (RSD)	974.222	870.864	1.100.813	2.945.899

Source: Petrović, 2012

All illustrations whether diagrams, photographs or charts are referred to as Figures. The name and number of figures should be centered on the line above a figure.

Figure 1. Agriculture, value added (% of GDP)



Source: Authors' calculations

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The Balkan Scientific Association of Agrarian Economists, Belgrade, Serbia, Institute of Agricultural Economics, Belgrade, Serbia and Academy of Economic Studies, Bucharest, Romania is pleased to announce that journal **ECONOMICS OF AGRICULTURE** has been accepted for indexing in the ***Emerging Sources Citation Index (ESCI),*** a new edition of Web of Science.

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