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CONTENT

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INSTITUTIONAL INVESTMENT POLICY FRAMEWORKS FOR THE AGRICULTURE OF THE REPUBLIC OF SERBIA

Vesna Miletić[1], Dušan Milosavljević[2], Boban Kostić[3]

Summary

Investments are of great importance to agriculture, which has a special role and place in the overall economic development of the Republic of Serbia. Analyses show unfavorable agricultural credit conditions, which are not in accordance with its role and its importance. The principal aim of this research is to contribute to designing optimal measures of investement policies in the Republic of Serbia.

The current economic and financial crisis during the transition process and the European Union accession process caused lower foreign direct investment inflows. It is necessary to sustain agricultural competitiveness, because it will face reduction of customs barriers and fierce competition in the free European market at the moment of becoming a member of the European Union. This requires institutional support while creating attractive conditions for foreign investments, in other words more favorable credit conditions and bigger budget for investments in agriculture which offers a huge production and export potential. EU accession processes include the liberalization of the agricultural produce market, and at the same time require a secure government support for agriculture in the tradition of developed countries. Therefore, it is necessary to systematically and continuously remove the obstacles during the harmonization process of our agricultural policy and that one of the European Union countries which is characterized by its highly subsidized agricultural production. At the end of this document are given conclusions of conducted research and recommendation for improvement investments to agriculture of Serbia.

Key words: *investments, agriculture, investment frameworks, agrarian budget, credit policy, the Republic of Serbia*

JEL: *Q10, Q18*

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Introduction

The years-long negative tendencies have become worse in the context of world economic and financial crisis. Agricultural producers prefer extensive production and reduce their number of livestock and cultivated surfaces, first of all because of the scarceness and costs of available financial resources. At the same time, it is possible to remark that the process of international integration and modernization of the agriculture of the Republic of Serbia has slowed down. The present crisis in the process of transition and accession to the EU has caused the decrease of consumers' purchasing power, as well as of the influx of direct foreign investments, which requires the creation and application of a new development strategy, especially in the sphere of investments. It is absolutely necessary to apply coordination measures, production instruments, monetary and tax policies in order to overcome the consequences of the years-long crisis in the agriculture of Serbia. We must take into consideration that the development of economy is directly related to the activities of all the other sectors of economy. The basic macroeconomic goals are to stop the outflow and to increase the inflow of direct foreign investments in agriculture and related economic fields. In the EU accession process we must try to harmonize long-term vital economic goals and the interests of agricultural producers.

Research methods

The research was conducted using various research methods and techniques like: induction, deduction, analytical and synthetic descriptive method. Contemporary domestic and foreign literature was used in the paper.

Analysis of investments in Serbian agriculture

The results of the analysis of the last decades show that investments in agriculture represent about 3% of the total investments, while agriculture contributes to an average of 20% of the total newly created value, which is the basic problem that must be solved when formulating the optimal Strategy of Development for the agricultural of the Republic of Serbia. In the beginning of this century, investments registered an insufficient and mild growth. In this period foreign companies have made limited investments in the purchase of individual enterprises and in the creation of commercial companies. At this moment the capital coefficient in agriculture is about 7% lower than the one realized in the total economy of Serbia. That fact imposes the necessity to establish new proportions in investments, according to the importance of some economic branches for the creation of social product. According to these criteria, investment policy must tend to increase the volume of investments in agriculture up to approximately 15% of the total investments. Only in this way it is possible to keep its competitiveness on the free European market, when Serbia will become a full member of the EU, which implies the reduction of customs barriers and the exposure to harsh competition on the free European market. That also implies the creation of conditions for foreign investments, the enhancement of production,

processing and storage capacities, the implementation of a better credit environment and the increase of the agricultural budget, in order to allow investments in the agriculture of the Republic of Serbia. In this way we would make good use of development chances for Serbia, as agriculture can have much higher production and export effects. In this sense, the influx of capitals must be based on the competitive advantages of agriculture, which implies ensuring competitive support to the new investment policy. Foreign investors also require clear rules and ownership structure, so that they could contribute to the introduction of new forms of organization, knowledge and technology in the agriculture of our country. For that reason it is necessary to define support measures for financial programs in the field of agriculture, by means of convenient crediting, development of the financial market, clear juridical regulations and the creation of efficient institutions. Economic logic imposes the increase of resources for development funds, especially in rural development, irrigation systems, protection and arrangement of agricultural land. The new policy must also be supported by diminishing the taxes on company profit, granting exemptions for investments in the procurement of basic means for agriculture and establishing investment duties at auction sales and privatization tenders, in which we must give priority not only to the offered purchase price and the social programs, but also to the amount of proposed investments.

Investments can have special importance in agriculture, due to its huge potential the return of invested resources in a short period of time. That confirms the place and role of agriculture in the total economic development of Serbia. Analyses have confirmed the direct relation between investments and the circulation of the social product, related also to agricultural production. Total investments had growing tendencies after 2001. However, we can remark that investments in agriculture have been at a low level, as they represented 2.7-3.73% of the total investments in the period 2001-2003. The capital coefficient in the agriculture of Serbia moved from 0.011 to 0.019 in the period 1996-2005, while the average value of that index amounted to 0.0147 in the same period.[4] The low investment activity was in fact the lowest in 2001, which is consequence and change of the social-political system. Data show a very low participation of investments in agriculture out of the total number of investments, which is also confirmed by the insufficient number of capital investments in the Autonomous Region of Vojvodina in 2007. The negative trend can also be observed in the agriculture of Serbia during the examined period, which especially confirms the comparison between the realized capital coefficient for agriculture and the total economy. It is necessary to emphasize that the amount of investments in agriculture is seven times lower than the value of the social product that it creates. Of course, the new strategy must solve this problem, because agriculture gives better results than the rest of the economy, due to the influence of natural and biological factors. That is why the new policy of stabilization and development must pay more attention to the level of investments in agriculture, which creates a constant surplus in the exchanges (about 17% of the total export of goods from Serbia).

4 Pejanović, R., Milić, D. (2008): *Investicije u poljoprivredu Republike Srbije*, Ekonomika poljoprivrede, br. 1/2008, IEP, Beograd.

Credit support to agriculture does not match its role and importance. It is insufficient also in the surrounding countries and in the EU and not-stimulating for investor countries. This is why, in the coming period, there can be serious consequences for its competitiveness on the European market. A higher quantity of investments is necessary to ensure a competitive approach to the international market of agricultural products. Among other reasons, the low level of investments has contributed to the backwardness of the agriculture of Serbia compared to developed countries, especially in the technology, production and effectiveness. It is not exaggerated to state that the years-long disinvestment process represents a major problem for the accession of Serbia in the EU. In the existing conditions of low accumulativeness of agriculture and inconvenient crediting conditions, it is necessary that the state supports investment activities in the coming period. The last decade has seen the decline of the otherwise important contribution of agriculture in the Gross Domestic Product. It was 15% in 2004 and dropped to 12,9% in 2006.[5] At the same time, the problem becomes more acute, because the agricultural budget represents a very small part of the budget of the Republic of Serbia and still is at a very low level. In 2004 it amounted to 4.99% and in 2007 to 3.31%.[6] Subvention resources get scarcer, even though the agricultural budget increases.

Efforts by the State to improve crediting conditions for agricultural producers have not given the expected results. This includes credits granted by the Ministry of Agriculture, which were heavily subsidized and distributed through commercial banks in 2004. The resources of the agricultural budget, amounting to 18 billion RSD in 2004, 16.2 billion RSD in 2005, 23.6 billion RSD in 2006 and 21.4 billion RSD in 2007 were no match for the real and economically justified necessities of agricultural production. In the same period of time, subventions burdened the agricultural budget with amounts from 14.3 billion RSD in 2005 up to 17.8 billion RSD in 2006. The total subsidies for agriculture amounted 11 million Euros in 2009.

Crediting resources for agriculture amounted to 2 billion RSD in 2007 and 3.7 billion RSD in 2004. Credit resources represented amounts from 9.3% of the total agricultural budget of 2007 up to 20.8 billion RSD in 2004. These data show a particularly low level of investment resources, as well as their diminishing trend. This period reported a decrease of credit resources within total subventions for agriculture, which amounted to 23.06% in 2004 and 11.8% in 2007. In 2008 short-term credits from budget resources amounted to 1.85 billion RSD, while long-term credits amounted to 1 billion RSD. It was confirmed that ministry resource is no replacement for an agricultural bank, which has a large credit potential, or for a developed bank system, but State support demonstrates it is widely accepted that public support is necessary in the context of the existing crisis, as well as in the process of accession to the EU. In 2004 about 28.000 producers were granted credits from the agricultural budget with an interest rate of 5.5%, amounting to 1.7 billion RSD. Middle term credits, with an interest rate of 3% and deferred refunding terms, were granted

5 European Business-Facts and Figures, 2006, pp.17.

6 Official Gazette of the Republic of Serbia, Nº 115/04 and 58/07.

to 600 households, amounting to 2 billion RSD from the agricultural budget. Crediting conditions have remained unchanged in 2005, when there were granted long-term credits for agriculture, amounting to 2.2 billion RSD, especially for cattle breeding, the acquisition of mechanical means and the creation of orchards a greenhouses. In this year only 18% of the registered households obtained support from the Ministry on the basis of short-term and long-term credits. Only 1.7% of the households in Serbia obtained the long-term credits they needed. In 2006 farmers were granted one-year credits with an interest rate of 5% and a commission of 1% with no currency clause. Long-term five-year credit was granted with an interest rate of 3%, with currency clause and deferred refunding terms up to three years. Such long-term credits were granted in amounts from 5,000 EUR up to 200.000 EUR in RSD counter value. Short-term credits with a total amount of 3.5 billion RSD were granted to 9.6% of households, while short-term credits were granted this year to only 0.6% of the registered households. In 2007 there were used only short-term crediting resources amounting to 3.9 billion RSD, while this year there were crediting problems and therefore long-term credit requests were received starting from August.

Terms and conditions of agricultural loans in Serbia

The specificity of agricultural production in the developed countries, according to economic regulations, is reflected in the credit policy of commercial banks. Such policies respect the seasonal character of agricultural production and the problem of capital circulation in agriculture. Intensive agricultural production, unlike extensive production, requires larger financial investment and because of that modern commercial banks need to have a developed system of selective interest rates, which is not the case in the bank reality of the Republic of Serbia. On the free financial market there are very inconvenient crediting conditions for agricultural production, which do not respect the specificity of agriculture and other economic activities. Interest rate for agriculture are high and do not match profitability rates of this branch of the economy. That is consequence of the high crediting risk, the annual circulation of capitals, the high existing expenses, the influence of natural factors of production and the instability of instruments and measured applied in agricultural policies. The worst crediting conditions are those of small producers, who are the most representative group in Serbia. The main problem is to obtain crediting instruments and guarantees, which is confirmed on the mortgage market. In the analyzed period there were very few available crediting resources, inconvenient crediting conditions and especially difficult conditions to obtain agricultural credits, which is confirmed by the average weighted effective interest rate of banks, which amounted to 15.8% in 2006 (16.56% for short-term credits and 10.09% for long-term credits). In 2009 the total of 7.332 short-term loans were realized (average amount was 291 thousand dinars) and 874 long-term loans (average amount was 27 thousand Euros). The total amount of investments in agriculture was 45 million Euros.

Differences between crediting conditions at different Banks in Serbia an insignificant, which is confirmed in analyses of effective interest rates. Crediting conditions in the surrounding countries heavily indicate how inconvenient crediting conditions are in Serbia, which is

directly reflected on the competitive capacity of agriculture. For example, in the Euro Zone countries the average short-term interest rate amounted to 3.1% and the long-term to 4.1% in 2006. This year, long-term credits in Austria were granted with an interest rate of 4.25% and a refund term of twenty years. The average interest rate for short-term credits amounts to 5.65% in Croatia, 7.66% in Bosnia-Herzegovina, 7.99% in Bulgaria, 6% in Poland and 5.6% in Slovenia. Data show that interest rates in Serbia are much higher than in EU and neighboring countries. This is a consequence not only of the offer and demand relation for credits, but also of investment risks, politic uncertainty, unregulated real estate market, ownership problems, inefficient administration and inconvenient institutional frameworks.

This trend of inconvenient crediting conditions for agriculture has continued in recent times, though there have been unsuccessful attempts to change the inconvenient crediting environment for agriculture and other economic activities through the Development Fund of the Republic of Serbia, leasing arrangements, international crediting institutions and organizations, the Development and Guarantee Fund of the Autonomous Region Vojvodina and local budgets for agriculture. Funds from the Development Fund of the Republic of Serbia cannot be used to credit primary agricultural production and infrastructure, but agricultural industry has access to this fund, just as any other branch of the economy. In 2007 27% of the funds granted by the Development Fund of the Republic of Serbia were destined to agricultural industry. The consequence of this policy is that, due to the activities of funds in Vojvodina, most of the crediting resources have been allotted to primary agricultural production in this region. Leasing arrangements represent one of the ways to finance agriculture, especially the purchase of agricultural equipment. Leasing arrangements have proved to be an elastic and effective way to finance agriculture in Eastern Europe countries. The first steps in the affirmation of this kind of financing were made in the year 2000, but were interrupted, due to the modifications of the Law on Financial Leasing adopted in 2005. Some commercial banks offer leasing arrangements for the purchase of agricultural equipment with a down payment of 5%, rates of 3-5%, expenses of 1% and other specific conditions. The Development Fund of the Autonomous Region Vojvodina was founded in 2002 in order to offer credits for the development of agriculture, food processing industry, entrepreneurship, equal regional development and small and middle-sized companies. The resources of the Fund have been obtained through the privatization process in the territory of the Autonomous Region of Vojvodina. In its five years of existence the Fund has granted credits amounting to 127 billion RSD, out of which 44.5% have been allotted to agriculture, especially to the purchase of agricultural equipment, implementation of quality standards, renovation of long-duration plantations and herds. The Guarantee Fund of the Autonomous Region of Vojvodina was founded in 2003 in order to ensure convenient crediting conditions for agriculture, by issuing guarantees to bank, so that farmers can obtain credits for the purchase of fertilizers, agricultural equipment, import replacement and export preparations. The resources of the Fund come from the privatization budget. The Fund has increased its guarantee capacity, which is possible only in the creation process of a financial market based on the necessities of agriculture. Local administrations in Serbia destine a part of their budget resources to the development of agriculture according to specific criteria.

International credit lines are present only in the processing sector, while primary production is credited with the funds from commercial banks, own resources and agricultural budget.

The analysis of factors that hinder the development of agriculture indicate placement problems for agricultural products and inconvenient credit conditions, which is consequence of the instability and uncertainty of the market, low profitability rates of agricultural production, lack of grace periods, lack of trust in the banking system and especially high interest rates, short refund terms and impossibility to obtain the necessary guarantees, due to the existing problems in the cadastre and the unsolved ownership issues. Such an unstable market, unsolved legal relations and high interest rates have a major influence on inconvenient crediting conditions in the Republic of Serbia.

Crediting conditions influence investment activities in agriculture in the Republic of Serbia, which are no match for the participation of this sector in exports and the creation of social product. Consequences of such inadequately low investments are a more extensive production, the variability of returns, low productivity and efficiency on the market. The adoption of new legal regulations regarding financial markets and credit cooperatives and the implementation of a new crediting system are preconditions for the increase of investment activities in the Republic of Serbia. This implies the adoption of a series of legal regulations under the model of EU countries and a more present role of the State in the creation of a positive political and economic environment for investments. New crediting models must be based on the development strategy for agriculture as a branch of the economy oriented to exports. Even in the present crisis conditions, the State can directly and indirectly contribute to the development of agriculture, especially in the field of investments. Of course, development is not favored by present conditions, which are characterized, according to the reports of the European Bank for Reconstruction and Development, by an increased financial risk, inefficient institutions and administration, un-competitiveness, undeveloped infrastructure, owner relations, an inefficient legal framework and an insufficiently developed banking system.

Optimazation measures for agricultural investments in Serbia

The creation of convenient conditions to attract foreign investments in agriculture implies political and macroeconomic stability, the reform of institutions, the reconstruction of the public sector, the elimination of monopolies, the reduction of public expenditure and the increase of investments in infrastructure, economic and agricultural activities, as well as the development of financial instruments. It is imperative to create an agricultural bank, because investments in agriculture can be financed from the public budget only as a short term solution. Like in the case of developed countries, such agricultural bank must place foreign and national capital in such a way that it will gain a privileged position, given that deposits from state subventions will circulate through this bank. This implies the implementation of a crediting system for agriculture that will offer lower interest rates compared to market rates, as well the creation of State crediting institutions that will establish interest rates in the current year. Such interest rates are usually around 4% compared to the interest rates of

commercial banks. In the U.S., State institutions created under that model approve credits for agricultural producers in convenient conditions. In the same way, developed EU countries offer convenient credit arrangements to their farmers. For these reasons the banking sector gives inconvenient and inadequate support to agricultural production in Serbia. Support through the agricultural budget is also inefficient, because its funds are no match for the importance and potential of agriculture. This situation prevents investments in innovation, exchange of knowledge, technology and equipment, threatening the competitiveness of the sector on the national and international markets, and will certainly escalate when Serbia will be admitted into the European Union, which gives special attention to agricultural policies. The experience of countries that have participated in pre-accession processes shows that it is necessary to remove obstacles in the harmonization process of national agricultural policies with EU policies. During the accession period, it is be necessary to insist on the increase of the agricultural budget, the real importance of agriculture and its contribution to the economy of Serbia. If the situation does not change, it will threaten the competitiveness of producers and processors on the European market, which is characterized by a highly subsidized agriculture. That requires the immediate reform of agricultural policies in order to increase its competitive position and strengthen the institutions that can contribute to develop the efficiency of agricultural production. In this way, agriculture can become a successful and intensive sector of the economy of Serbia. Accession processes require the liberalization of the agricultural foodstuff market, but at the same time the State support for agriculture under the model of EU countries. This issue should be constantly present during the negotiations period, as well as during the accession of the EU in the World Trade Organization. Policies must be oriented to keeping the competitive skills of agriculture in conditions of liberalization. That requires a drastic decrease of customs protection for the agriculture of Serbia, as well as the simultaneous application of permissible instruments based on international standards, which can hardly done in the present context. During the accession period, it is necessary to insist on the creation of conditions to use the pre-accession assistance funds of the EU, especially the IPA, which merge, in fact, diverse earlier programs of the European Union (SAPARD, PHARE, ISPA, CARDS). This program represents a financial assistance instrument of the European Unit for the Western Balkans and Turkey in the period 2007-2013. The creation of the conditions to use the funds of this program requires the coordinated action of state and civil institutions, the definition of necessities, the implementation of high-priority projects, the creation of an administrative framework within EU recommendations, the strengthening of public organizations, the professional formation of personnel and the promotion of European values. At short term, it is necessary to create the conditions to use two of the five components of the IPA program. Reform steps must refer not only to agriculture in a narrow sense, but to the agricultural business as a whole, which employs a large sector of labor forces, contributes with a third of the created production value and produces surpluses in the foreign trade in Serbia. The lack of financial resources represents the basic obstacle for the creation of a modern and technologically developed agricultural business in Serbia. More convenient should ensure the profitability of total investments in this important field of economy. Financing models are based on current capacities, e.i. on the fragmentation of the agricultural foodstuff sector. Small and middle-sized companies from this sector must enjoy

convenient conditions to obtain the financial resources, which are necessary for investments in production, processing and placing of the products. That implies lower interest rates, credit standstills and longer refund terms. It is necessary to internationally promote investments in the agriculture of Serbia in a modern way. It would be helpful that State institution and commercial banks undertake coordinated activities in order to create a guarantee fund for agricultural credits. In coordination with other measures, such step would make possible the decrease of interest rates and the increase of investments in the agriculture of Serbia. The development of this sector implies the establishment of a new system of incentives and export subventions, the formation of specific public funds, an agricultural bank, a new policy of budget reserves, budget financing for infrastructure, new technologies and the reorganization of institutions in defined terms.

The present state requires that the State strengthens its role in the creation of conditions for higher investments in agriculture as one of the main chances of development for Serbia.

Conclusions

The results of the research clearly show the necessity of institutional support in the creation of convenient conditions for investment activity in agriculture, which implies more convenient crediting conditions, an increase of the resources allotted to the agriculture budget, as well as other monetary and tax measures. That way the set goals were accomplished and scientific contribution to defining optimal measures of investement policies in Serbian agriculture was given**.**

Integration processes imply the liberalization of the market of agricultural foodstuff products, but also the existence of adequate State support for agriculture, under the model of developed countries. The influx of capitals must be based on the competitive advantages of agriculture, which imply the institutional support to the new investment policy. That would create development possibilities, because agriculture has a great production and export importance in the Republic of Serbia. That is why it is so important to apply the measures mentioned above in order to support the investment policy in agriculture, mainly through the creation of efficient institutions, modern legal regulations and budget support, as well as through convenient crediting and development of the financial market. It has been confirmed that a higher level of investments in agriculture represents an indispensable precondition for a competitive approach to the international market of agricultural products. Even in the current crisis conditions, the State has real possibilities to enhance investment activities in the agriculture of the Republic of Serbia. In order to overcome the long-term negative tendencies for agriculture, in the context of the global crisis and the accession process to the EU, it is necessary to apply the analyzed new strategy of development, as well as investment policies in the agriculture of the Republic of Serbia.

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INSTITUCIONALNI OKVIRI INVESTICIONE POLITIKE U POLJOPRIVREDI REPUBLIKE SRBIJE

Vesna Miletić[7], Dušan Milosavljević[8], Boban Kostić[9]

Rezime

Investicije imaju ogroman značaj u poljoprivredi, koja ima posebnu ulogu i mesto u ukupnom ekonomskom razvoju Republike Srbije. Analize ukazuju na nepovoljne uslove kreditiranja poljoprivrede, što ne odgovara njenoj ulozi i privrednom značaju. Osnovni cilj istraživanja je da se pruži naučni doprinos u stvaranju optimalnih mera investicione politike u Republici Srbiji.

Postojeća ekonomska i finansijska kriza u procesu tranzicije i pridruživanja Evropskoj uniji je uticala i na smanjenje priliva stranih direktnih investicija. Potrebno je očuvati konkurentnost poljoprivrede, jer će se ona u momentu punopravnog članstva u Evropskoj uniji suočiti sa smanjenjem carinskih barijera i oštrom konkurencijom na slobodnom evropskom tržištu. To zahteva institucionalnu podršku u stvaranju privlačnih uslova za strana ulaganja, odnosno povoljnijih uslova kreditiranja, i povećanju budžetskih sredstava za investicije u poljoprivredu, koja raspolaže sa ogromnim proizvodnim i izvoznim potencijalima. Integracioni procesi podrazumevaju liberalizaciju tržišta poljoprivredno-prehrambenih proizvoda, ali istovremeno i obezbeđivanje državne podrške poljoprivredi po ugledu na razvijene zemlje. Zato je potrebno sistematično i kontinuirano uklanjati prepreke u procesu harmonizacije agrarne politike sa zemljama Evropske unije, koje karakteriše visoko subvencionisana poljoprivredna proizvodnja. Na kraju rada dati su zaključci istraživanja i preporuke za unapređenje investicionih ulaganja u poljoprivredu Srbije.

***Ključne reči**: investicije, poljoprivreda, institucionalni okviri, agrarni budžet, kreditna politika, Republika Srbija.*

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FACTORS ANALYSIS REGARDING THE GROSS PROFITABILITY OF WINE MARKET - CASE STUDY

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Summary

Small vineyard holdings become profitable in a market increasingly globalized. However through a process of structural adjustment supported by external and internal funds, technical modernization is essential in conditions of appropriate training structures, so that it can be used to the full resources available. This provides the vine and wine products a high quality with minimum costs, tailored for the use of modern technologies, with a high labour productivity resulted in a positive economic environment as well as a stable economy which in the end will provide support for a profitable export through efficient sales just like the most vine productive countries.

Key words*: cost, commodity production, price, marketing wine, market*

JEL: *Q12, D24*

Introduction

The efficiency of a vineyard farm within the market economy is assessed through its structure and prices of the commodity output compared with other similar activity units. Their considerable demand of financial resources generates the necessity to achieve a competitive efficiency out of the commodity production as a "sine qua non" condition of survival on the market.

Therefore the factor analysis on the gross efficiency, of the overall commodity production, proves to be an important mean of identification and of capitalization of the internal resources aimed to increase the final economic efficiency due to the analytical possibilities of information.

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Case Study

Based on the data in the Table 1, regarding the production of S.C. Tohani vineyard holding in the years 2008 and 2009, profitability ratios shall be calculated below.

Table 1. Factor analysis on the gross profitability of the overall commodity production achieved by S.C. Tohani vineyard farm during 2009-2010

No.	Indicators	Symbols	Achievement in 2009	Achievement in 2010
1	Commodity production expressed in average selling prices without WATT (revenues on sold production)	ΣQmp	2,463.232	2,945.767
2	Maximum production expressed in production unit costs (expenses afferent to the sold production)	ΣQmc	2,208.614	2,568.471
3	Gross profit afferent to the overall commodity production (rd 1-2)	Pfb	254,618	377,296
4	Gross profitability ratio afferent to the overall commodity production (rd 3x100:2) – in %	Rrb	11.53	14.69
5	Commodity production achieved in 2010 expressed in average selling prices of the precedent year	ΣQm_1p_0 ΣQm_1p_0	x	2,583.507
6	Commodity production used in 2010 expressed in the production unit costs of the precedent year (without VAT)	ΣQm_1c_0 ΣQm_1c_0	x	2,316.456
7	Expenses at 1,000 ron revenues from the production selling (rd 2x1000:1) in ron	Ch 1000/ ΣQmc	896.633	871.761
8	Gross profit at 1,000 ron revenues out of the sold production (1000 – rd7) – in ron	Pfb 1000/ ΣQmp	103.367	128.239

Source: Accounting records of S.C.Tohani S.A.

The used template is based on the following formula:

$\Delta Pfb = Pfb_1 - Pfb_0 \Delta Pfb = Pfb_1 - Pfb_0$ = 377,296 – 254,618=122,678 ron

Out of which due to:

(1) The action of the physical amount of commodity production per product:

$$\Delta P_{jb} = \frac{P_{jb_0} \cdot i \cdot Q_m}{100} - P_{jb_0} = \frac{P_{jb_0} \cdot \frac{\sum Qm_1p_0}{\sum Qm_0p_0}}{100} - P_{jb_0} = \frac{254{,}618 \cdot \frac{2{,}583.507}{2{,}463.232} \cdot 100}{100} - 254{,}618$$

$$= \frac{254{,}618 \cdot *104.88}{100} - 254{,}618 = 267{,}043.35 - 254.618 = +12{,}425.35 ron$$

(2) The actions of the structure of the overall commodity production:

$$\Delta P_{jb(s)} = \left(\sum Qm_1p_0 - \sum Qm_1c_0\right) - \frac{P_{jb_0} \cdot i \cdot Q_m}{100} = 2{,}583.507 - 2{,}316.456 - \frac{254{,}618 \cdot 104.88}{100}$$

$$= 267{,}051 - 267{,}043 = 8$$

(3) The action of the cost on the unit of commodity product:

$$\Delta Pfb(c) = \left(\sum Qm_1p_0 - \sum Qm_1c_1\right) - \left(\sum Qm_1p_0 - \sum Qm_1c_0\right) = (2{,}583.507 - 2{,}568.471) -$$

$$(2{,}583.507 - 2{,}316.456) = 15{,}036 - 267{,}051 = -252{,}015 ron$$

(4) The action of the average selling price (without VAT) per unit of commodity product:

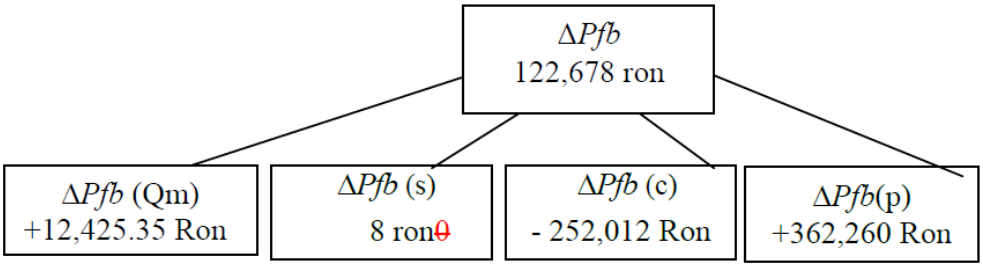
$$\Delta Pfb(b) = \left(\sum Qm_1p_1 - \sum Qm_1c_1\right) - \left(\sum Qm_1p_0 - \sum Qm_1c_1\right) = (2{,}945.767) - (2{,}568.471) -$$

$$(2{,}583.507) - (2{,}568.471) = 377{,}296 - 15{,}036 = 362{,}260 ron$$

$$\Delta Pfb = \Delta Pfb(Qm) + \Delta Pfb(s) + \Delta Pfb(p):$$

122,678 = 12,425.35+8-252,015+362,260 Ron

In terms of synoptic results the factors quantifications are the following:



For the calculation of the gross profitability the following formula is used:

Δ Rrb=Rrb$_1$- Rrb$_0$=14.69-11.53=+3.16

Out of which due to:

The action of the structure of the overall commodity production:

$$\Delta R_{r(s)} = \frac{\sum Qm_1p_0 - \sum Qm_1c_0}{\sum Qm_1c_0} \cdot 100 - \frac{\sum Qm_0p_0 - \sum Qm_0c_0}{\sum Qm_0c_0} \cdot 100 =$$

$$\frac{2{,}583.507 - 2{,}316.456}{2{,}316.456} \cdot 100 - \frac{2{,}463.232 - 2{,}208.614}{2{,}208.614} \cdot 100 = 11{,}53 - 11{,}53 = 0$$

The action of the cost on the commodity product unit:

$$\Delta R_{rb(c)} = \frac{\sum Qm_1p_0 - \sum Qm_1c_1}{\sum Qm_1c_1} \cdot 100 - \frac{\sum Qm_1p_0 - \sum Qm_1c_0}{\sum Qm_1c_0} \cdot 100 =$$

$$\frac{2{,}583.507 - 2{,}568.471}{2{,}568.471} \cdot 100 - \frac{2{,}583.507 - 2{,}316.456}{2{,}316.456} \cdot 100 = 0{,}59 - 11{,}53 = -10{,}94\%$$

The action of the average selling price, without VAT, on the commodity product unit:

$$\Delta R_{r(p)} = \frac{\sum Qm_1p_0 - \sum Qm_1c_1}{\sum Qm_1c_1} \cdot 100 - \frac{\sum Qm_1p_0 - \sum Qm_1c_0}{\sum Qm_1c_0} \cdot 100 =$$

$$\frac{2{,}945.767 - 2{,}568{,}471}{2{,}568.471} \cdot 100 - \frac{2{,}583.507 - 2{,}568.471}{2{,}568.471} \cdot 100 = 14{,}69 - 0{,}59 = +14{,}10\%$$

Δ Rrb= Δ Rrb(s) - Δ Rrb(c) + Δ Rrb(p)
+3.16%= 0 - 10.94% + 14.10

Considering the data in the Table 1 as well as the results of the factor quantifications the diagnosis regarding the efficiency trend can be assessed in both synthetic and analytic terms.

In synthetic terms the diagnosis has an overall character aiming the essence of the found situation. In this context the efficiency trend can be assessed as generally positive as a substantial increase of the gross profit was recorded resulted from the selling of the total commodity production, i.e. 41.18% which represent the basic component of the operation. Thus, the main financial resource for the increase of the development fund as well as for the making up of the legal reserves, the employees' share to the profit and the dividends paid to the shareholders were ensured.

At the same time a significant increase of the gross profitability afferent to the overall commodity production (i.e. 27.41%) which finally means an increase of the profit rate generated by the financial, material, land and human resources used within the vineyard farm in terms of commodity production.

Conclusions

Among the quantified factors, the structure of the commodity production did not influence the profit level which indicates that the unit worked on "the old patterns", and failed to increase the weight of the quality products so that to achieve some higher selling price for the traded production.

The influence of the unitary production cost was negative due to the general unfavourable context which leaded the increase of the purchase prices for the production factors (i.e. fertilizers, fuel, raw materials, services, etc), which is known as the phenomenon of "prices' scissors".

The increase of the gross profit compared to the precedent year, with 122,678 Ron, was achieved mainly based on the increase of the average price of the commodity production, which revealed an increase of the products' quality which made possible finding of a certain category of buyers ready to accept higher prices for a better quality.

The increase of the gross profitability afferent to the total commodity production is considered a fully positive economical-financial outcome only when the profitability was at a competitive level in terms of internal and external market within the given period allowing to cumulate necessary funds to purchase new technology for achieving grapes for wine as well as for reaching a mass industrialized production. Only in this way S.C. Tohani S.A can deal with the harsh conditions of the internal and external market competition.

On the other hand, in analytic terms the diagnosis of the gross profitability afferent to the overall commodity production can gain, through a deep causal investigation at the level of each factor, a rigorously substantiated economical-financial character.

In this context, the correct assessment of the action of the physical amount of the commodity production per product over the gross profit should consider several management coordination as well as the demands on the market economy. In case of S.C. Tohani vineyard, the increase of the physical amount of the commodity production per product with 4.88% determined an increase of the gross profit with 12,425.35 Ron. Such a favourable action of the quantitative factor over the gross profit can be appreciated as fully positive in economical-financial terms only if the following conditions are fulfilled:

The increase of the physical amount of the commodity production per product met the market's demands having consequently an ensured marketplace along with a convenient price. In the case of S.C. Tohani, the increase of the physical amount grounded on the increase of the market's demands while the high quality of the traded products ensured a profitable price for the unit;

The efforts of S.C. Tohani S.A. to increase the physical volume of the production aimed at the same time the increase of the quality in accordance with the international standards and the consumers' demands;

The increase of the physical volume of the commodity production on product took place in different rate depending on the financial resources of the unit as well as the internal and external market demands regarding the high quality red wines.

Regarding the structure of the overall commodity production there was no influence on the amount of the gross profit due to some obsolete market strategies of the employees

working within the marketing department according to which the contracts were renewed without seeking new partners or new products to prospect the internal and external market. Thus, the management of the unit has to consider the allocation of substantial funds for a more rigorous market research in order to see the trends and to meet the consumers' demands.

Regarding the cost per unit of commodity product a negative influence was recorded in amount of 252,015 ron. Among the causes which contributed to the increase of the cost per unit of commodity product we mention **first of all** the unfavourable general context of the economic environment which generated the increase of the price of the production factors, i.e. fuel, fertilizers, pesticides, energy, services etc.

Second, the high cost of the bank credits which the unit has to pay to the banks to ensure the cash flows necessary to vineyard and wine production activities which have a long operation cycle.

Third, we should mention the high cost of the repairs on the tractors and agriculture equipment generated by both the high price of the spare parts and by the frequent need of repairs due to the obsolete condition of the vineyard equipment.

Fourth, an upgrade of both vineyard equipment and processing flow is necessary to improve de farms activity. This upgrade could eliminate the parasite process links which uselessly consume the unit's financial resources as well as saving on the expenses with the employees' wedges.

The diagnosis of the influence of the average selling price (without VAT) on the commodity product unit over the gross profitability should consider both the contribution of this factor on the improve of the profitability of the commodity production and the strategy of the vineyard unit regarding the using of the selling price as a specific factor in the context of the market economy.

Thus, in the case of S.C. Tohani S.A. the increase of the average price on commodity product unit lead to an increase of the gross profit with 362,260 Ron compared to the precedent year as well an increase of the gross profitability with 14.10 %. These data, however, reveal that the vineyard farm which is the subject of our case study recorded increase of the unitary average selling prices (without VAT) at all the commodity products, compared to the precedent year.

In the context of the efforts required by the actual market economy regarding the increase of the commodity production profitability such a favourable situation can be positively assessed only if this was the result of the farm's efforts namely if the increase of the average selling price (without VAT) was due to an efficient structure of the commodity production on sub-units structure (on farms), i.e. on business partners, periods of producing and delivery as well as on quality categories.

The strategy of setting up the selling prices (without VAT) should consider the prices' impact on the market so that the vineyard products to be accessible to the buyers. In this respect the ordinary wine should have a relatively low price to be accessible to the low

income consumers while other wines of high quality D.O.C should have higher prices due to their superior quality and addressed to high income buyers.

At the same time a marketing policy should be consider in terms of setting up some selling price relatively low for the new products aimed to segment of buyers as large as possible and followed by setting up of the best price strategy depending on evolution of the of the demand-offer ratio.

The above mentioned data show that the Romanian viticulture sector, through its natural special advantages, in terms of well trained labour force and enough good material resources, can become a competitive sector on the internal and international market. Therefore, efforts should be focused on setting up production structures enough viable to receive substantial financial support from the state in view of consolidating the private investments within the efficient vineyard farms.

However, given the high degree of fragmentation of the vineyard farms it is impossible to calculate efficiency indicators based on which to judge the extent to which their activity was profitable. Therefore, the government should engage more by introducing appropriate policies to create the necessary conditions, in order to encourage association, land lease and sale of this kind, the funds granted for wine growing through the European Union's and the World Bank's special programmes will be efficiently used, and wine growing will become an attractive and efficient activity.

Small wine farms can become profitable, in an increasingly globalized market, only through a process of structural adjustment supported by internal and external funds, which at this stage it is based on technical modernization under the optimal size structures, so that the available resources can be used to their maximum capacity. For, after all, what is a high productivity? It means studying the market needs in order to know what to produce and at what price to sell, it means optimal endowment with machineries, equipments, technologies, etc.., which enables the procurement of high quality wine products with minimum costs; it means efficient use of well qualified workforce, adjusted to the requirements of modern technology use, with a high labour productivity; it means continuously increasing wine products quality so that the selling price to be accepted by buyers and to sell products as easily; it means a positive economic environment, characterized by a stable economy, in order to provide the population with sound gains to ensure they can consume greater quantities of wine products; it means supporting the sales in the export by appropriate economic leverage, as most wine growing countries do.

During 2000-2010 the dynamics of wine products profitability shows that the activity in the vine growing sector is still rewarding for the wine growing trade companies, as they have optimally sized production areas. As regards the technical endowments with machineries, equipments, modern installations, in the majority of the wine exploitations of the Dealu-Mare vineyards, there is an obvious lagging behind, in that they are worn out physically, through an overtime service, and morally by the emergence of more efficient machineries, both as regards the efficiency, and its capability of ensuring a high

quality. As regards the work force, steps towards a higher qualification are necessary, enabling efficient use of new machines and technologies and increase in the labour productivity as the main factor to production cost minimization.

In terms of efficient marketing, it should be noted that most wine growing trade companies still work after old methods, which allowed them, to a lesser extent, the exploitation of the market opportunities. Therefore, for this vital sector of modern enterprise, decisive steps towards changing the outdated mentalities are required, in order to introduce appropriate marketing strategies in compliance with the requirements of the Romanian viticulture integration in the EU structures.

Thus, it is possible to adapt, in the course of action, to the changing requirements of the buyers, emerging both on the domestic market and at export. This will allow keeping the old markets and their adaptation to new requirements, as well as conquering new markets, thus, providing positive influence on the sales volume, in the sense of increasing them, and on the business partners' structure, in order to obtain favourable prices for the company.

Small wine holdings, which currently fail to use the wine-farming areas, the related production and the work force efficiently, should be encouraged and supported, by appropriate measures, in view of ensuring their association in order to create viable units that can meet the demands of fierce competition. In the integration of the Romanian viticulture in the EU, it is impossible to believe that we would be able to compete and be competitive with wine holdings of countries like France, Italy, Spain, etc., which received significant aid from their countries and from the EU.

The experience of these countries shows that it is possible to establish viable vine holdings provided we pull together all the efforts - both the owners' and state's - so that the funds received from the European Union, the World Bank, etc. be fully and efficiently used. Only in this way, will Romania be able to keep a top ten position as regards its surface and wine production. It would be an error to lose so easily the result of several generations work, as none of the wine growing countries, with similar conditions to ours, missed the opportunity to adapt their viticulture to the requirements of era in which we live.

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HUNTING IN RURAL AREAS OF BACKA

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Summary

The aim of the study was to determine whether hunting, and with which activities in the rural areas, correlate, and whether, as such, may contribute to the development of rural communities in Backa. The used methods in this paper are: fieldwork (systematic observation and interviews), analysis (literature and documentation) of content and statistical methods. The study also revealed that hunting, which is located entirely in rural areas, which are, in fact, the only hunting areas and hunting wildlife habitats, is important and profitable area of business, and that hunting tourism, as the most propulsive part of hunting, is in the correlation and complementary relationship to rural tourism in Backa. To achieve even better integration of hunting in the rural development of Backa, it is necessary to prevent and eliminate the effects of certain limiting factors.

Key words: *Backa, hunting, rural areas, development*

JEL: *Q01, Q57*

1. Introduction

The term «rural area» means the area whose main feature is primarily the use of land for agriculture and forestry. Council of Europe, defines the term «rural area» as «part of the country in the interior or on the coast, which includes smaller towns and villages, where the main part of the territory is used for: a) agriculture, forestry, aquaculture and fisheries, b) economic and cultural activities of the population of that rural area (crafts, industry, services), c) non-urban recreation and leisure activities, and d) for other purposes, such as housing» (Lazic etc. 2007, p. 18). According to Anderson (2003) rural area includes the people, the land in open natural areas and rural areas beyond the immediate economic impact of major urban centers.

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In most cases, rural areas have rich ecosystems and fairly preserved biodiversity, which provides favorable conditions for development of, other than agriculture and forestry, economic activities such as water management, tourism, craftsmanship, urban planning, fishing, hunting, etc. Bačka is an area in Vojvodina (northern Serbia), which represents a rural area[4] with a high level of agricultural production, sufficient level of infrastructure potential and relatively positive demographic trends, with Novi Sad as the administrative, cultural, and educational center. As such, this area has a number of competitive advantages in the field of economy and overall development. Hunting is an economic activity that, at first glance, takes no considerable part in the development of rural areas, and is, in our country, most developed in Backa, which represents one of the most advanced hunting destinations in Europe[5]. Because the areas in which hunting game is grown and used (hunting grounds), are located entirely in rural areas, there is no doubt that hunting is one of the segments of the rural economy, and thus of the rural development.

The aim of this study was to determine whether hunting, and which activities in the rural areas, correlate, and whether, as such, may contribute to the development of rural communities in Backa.

2. Research methodology

In addition to basic scientific and logical processes (analysis, synthesis, induction, deduction, abstraction, generalization, comparison), this research applied the following **scientific methods:** field research (systematic observation and interviews), analysis (literature and documentation) of contents, cost - benefit and SWOT analysis, the statistical method (descriptive statistics). **The sample of the research** are the hunting grounds[6] and overall hunting management in three municipalities in Backa: Ada, Becej and Srbobran, which in recent years participated in the implementation of rural development programs of the European Union aimed at the economic development of local governments (IPA projects of regional cooperation).

3. The concept and importance of hunting

In the literature there are many definitions of hunting. According to the Law on Hunting ("RS Official Gazette"), hunting is the protection, breeding, hunting and harvesting of

4 According to the definition of rurality, Backa as distinctly agricultural region, can be considered rural area, as most of the settlements in Backa, as indicators of population density show, agricultural activity, and the age structure of the population in rural category.

5 This can be concluded from a number of texts on hunting that are of professional character as such. Prentović (2004), Dragin (2005) and others. As a result of respectful hunting areas (hunting grounds) and quality hunting management in Bačka were hunted capital specimens of wild animals, which trophies worn the titles of world and national champions.

6 The hunting area is specified area of land, water and forests, surrounded by natural boundaries, which represents the habitat of wild game, in which the effects of environmental (natural, anthropogenic and other) factors allows its cultivation, protection and sustainable use.

wildlife as a natural resource, and hunting, since the main purpose of hunting includes hunting and trapping of wildlife for the purpose of providing meat, skins and trophies and collecting eggs of game birds. What follows from the previous and other definitions, shows that hunting is not only an element, but the main theme and content of hunting, so it is necessary for this term to be defined more precisely. Instead of quoting of a number of definitions of hunting given by different authors, the definition given by Prentović (2006) seems to be sufficient: "Hunting is a recreational hobby activity with elements of a sport competition of a number of people (hunters) motivated by their strong need for hunting (shooting and trapping) game in order to experience a sort of pleasure and enjoyment, and to obtain certain economic benefits (by hunting) by obtaining the meat, skin, trophies and other parts of the game.

In some definitions of hunting the emphasis is placed on some of its essential features (ecological[7] and economic), so that the hunt, as the main activity of hunting, is not mentioned. In that sense, the (alternative) definition of hunting according to the Law on Wild Animals and Hunting, according to which hunting includes editing and fitting hunting grounds in accordance with the principles of maintaining ecological balance and environmental protection standards, and has special social significance, because the game and hunting areas are natural resources of particular concern. Maric also (2003), in the definition of hunting, puts emphasis on its ecological function.

Selmic and associates (2001) in the definition of hunting favors its economic dimension and define it as "economic activity, which cannot be accurately considered production or service. It includes both terms, because it involves cultivation, preservation and use of harvested game, which could be considered a productive activity and defined as the concept of hunting management. It also, includes hunting tourism, as the most profitable part of the hunting economy, which could be considered to be a service activity." Hunting is an important activity that brings significant economic benefit. In the United States, according to Montgomery and associates, only in 2006, 12.5 million hunting participants, of over 16 years of age, made a turnover exceeding 25 billion dollars. Annual consumption per hunter is 1192 dollars, or $ 110 per day of hunting (Montgomery and Blalock, 2010). The same authors state that other activities besides hunting, especially in rural areas, significantly increase employment, and thus increase the economic income of local communities through the collection of fees for residence and hunting, selling their services and products, and more. According to the data of the Service for the Protection of Nature in New Jersey, USA, (www.state.nj.us / dep / FGW / news / feeincrs) on the basis of the issued licenses to hunt, only in the course of 2000, the state obtained a profit of 3.8 billion U.S. $, and the bulk of the funds was invested in the conservation of nature. According to research by Bohne (Bohne, 2008) trophy hunting in Tanzania, which includes tourism, sports and safari, plays an important role in rural development, because in the period of 1998-2003 the economic profit increased by 347.7%, and rose to nearly $40

7 Ecological function of hunting is reflected in the fact that it is also directed to the protection, preservation and enhancement of habitat conditions for the existence of wildlife, as well as nursing, health care and planned exploitation of wild animals, which can largely preserve the natural environment and biodiversity of flora and fauna.

million, and has a linear trend, with the annual increase of about $162,000 U.S. According to the observations made in Norway (Skonhoft, 2006) reintroduction of the gray wolf in the Scandinavian countries during the last two decades, and his controlled shooting, enabled a significant increase in the revenue for the agricultural population, by reducing the number of mice and collection of fees for shooting.

In addition to environmental and economic aspects, hunting also has a health (recreation and active relaxation in a healthy natural environment), cultural (behavior in the spirit of hunting moral and the code of hunters ethics, artistic creativity inspired by motifs of nature, wildlife and hunting) and educational (education of not only hunters, but the broader population of young people and adults in the spirit of understanding, cultivation and protection of wildlife, nature conservation and preservation of biodiversity) meaning[8]. The importance of hunting is reflected in its contribution to the development of other activities including: agriculture and forestry (encouraging the growth of those types of crops that are used for feeding the game, planting of trees, protection of forest stands and crops from damage done by wildlife, etc.), tourism (through activity of hunting tourism), hospitality (expanding restaurant network and use of game meat in their cuisine), commerce (selling the items of meat, skin, fur, horns, tusks, bones of wildlife, etc.), and other industries, as are travel and telecommunications industry, and also certain industries (for example those involved in the production of hunting weapons, ammunition, equipment, clothing, souvenirs, etc.). The special significance of hunting lies in the fact that modern hunting is conceived and constituted so that it is in the function of sustainable development. It means that hunting which represents a complex activity of managing wildlife populations for their protection, breeding (artificial production, population, health care, nutrition), hunting and rational use, as well as maintaining and improving the habitat conditions in hunting grounds, not only provides the optimum reproducibility of the existing wildlife populations according to the potentials of their habitats (biological and economic capacity of a hunting ground), but also aims to prevent and repair any damage wildlife may cause in a given ecosystem or biotope. Therefore, it does not significantly distort biological diversity and can be characterized as sustainable hunting.

4. Natural-geographical features of Backa[9]

4.1. The geographical position of Backa

Bačka is located in the southern part of the Pannonian Plain and the northwest part of the Autonomous Province of Vojvodina, and occupies an area between 45º 16 ‘north latitude and 20° 37’ east longitude. Its area is 9244 km². The Tisa River separates it from Banat, while the southern border, towards Srem, is the Danube River. The western border represents the part of the state border with Croatia, which extends from Backa

8 The social importance of hunting and functions is discussed in more detail in: Prentović (2006., p. 53-60)

9 The natural geographic features of Backa are considered in more detail in: Prentović, R. I Dragin, A. (2007, p. 166 – 176).

Palanka in the south, along the Danube to the north, to the border with Hungary. The northern border of Backa forms the border with Hungary.

4.2. Physical and geographical features of Backa

Land in Backa is built of sediment middle and upper Pleistocene and Holocene age-river and eolian sediments. It is a plain land, altitude from 76 m to 143 m. There we can underline loess plateau, loess terraces, alluvial plains and sandy soil.

Climate in Backa is steppe continental, with four marked seasons. Summers are hot and dry, and winters are relatively cold. Mean annual temperatures are from 10,5 – 11,2 ^{0}C, and rainfall is about 600 ml. Typical winds are north, northwest and wind cold Kosava.

The most important headwaters are rivers Danube and Tisza, and the Great Backa Canal, rivers Jegricka, Krivaja etc.

In Backa vegetation is cultural-steppe, with very little forests (about 3,5%) and those are mostly black locust, linden, willow, beech and others.

Fauna of Backa, among others, is make from rabbits, deer, wild boars, foxes, jackals, and pheasant, field partridge, pigeons, doves, waterfowl and others.

4.3. Natural resources of hunting in Backa

The main natural resources are game species, as a direct economically exploitable category, and hunting grounds that represent wildlife habitat and areas where all the important activities of hunting management take place (growing, protection and rational use of wildlife through hunt, sale of shot game and its trophies, as well as the sale of live animals and, in particular, hunting tourism).
The hunting grounds of Backa (which are 43) spread over 899,537.2 hectares and are located (by the Regulation on the establishment of hunting areas in the territory of the Republic of Serbia) within three hunting areas: North Backa, South Backa and East Backa. These hunting areas are managed by the following users (Table 1)

Table 1. Users of hunting grounds in Backa

No.	Name of the user	Number of users	Number of hunting grounds	Area of the hunting ground (ha)	Percent of hunting area
1.	Hunters association of Vojvodina (through hunters associations)	26	27	852149	94.73%
2.	Public company "Vojvodinasume"	1	7	33274.6	3.70%
3.	Serbian armed forces (hunting ground "Karadjordjevo")	1	1	6914.6	0.77%
4.	Fishermens grounds	7	7	4662	0.52%
5.	Agricaltural company "Zobnatica" - Backa Topola	1	1	2537	0.28%

Source: Hunting ground`s management

Vegetation structure of hunting areas in Backa is shown in Table 2.

Table 2. Vegetation structure of hunting areas in Backa

No.	Vegetation structure	Area (ha)	Share in %
1.	Forests and forest lands	32,109.03	3.57
2.	Meadows and pastures	47,722.61	5.31
3.	Arable land	719,886.28	80.03
4.	Orchards and Vineyards	14,703.66	1.63
5.	Ponds, swamps and water	14,656.41	1.62
6.	Other land	75,059.27	8.34
Total hunting ground area		889,537.20	100.00

Source: Hunting ground`s management

According to data provided by Prentović and Dragin (2007) funds of major cultivated species of game in Backa are the following[10]:

1. Hunting areas managed by hunting associations: 20,359 deer, 138,917 rabbits, 58,887 pheasants and 9753 partridges;
2. The hunting grounds of the public company "Vojvodinasume": 2,014 elks, 42 of fallow deer, 121 mouflon, 728 deer and 1,525 wild boars;
3. Hunting Ground "Karađorđevo": elk - 400, fallow deer - 300, Virginian deer - 40, mouflon - 200, deer - 200, wild boar - 270, rabbit - 200, pheasant - 300 and partridge - 50.

When the hunting grounds within fishery farms are concerned (where the main cultivated species are waterfowl), data is not shown, because entities that manage wildlife species do not determine or do not show their annual fund in the form of hunting records. The same applies to some other species that are abundant in the hunting grounds in Backa: foxes, wild pigeon, turtle dove, quail, Snipes etc. No data is available for the hunting ground of the Agricultural Enterprise "Zobnatica" from Backa Topola, in which, after the privatization, hunting management has remained private.

The major cultivated species of wildlife in all three hunting grounds ("Pheasant" from Ada, "Becej farms" from Becej and "Pheasant" from Srbobran) are: the deer, rabbit and pheasant. These are the most widely spread types of game in Backa. Numbers of hunting deer and rabbit hunting in the period from 2006 - 2010 are shown in Table 3.[11]

10 Contingent of the cultivated species of wildlife is determined in March each year by the organized counting with adequate methodology. Funds of game are, otherwise, dimensioned by the economic capacity of the hunting ground and are approximated for a longer period of time. It may be reasonable to assume that the current state of the wild game in Backa approximate values shown by the quoted authors.

11 Due to incomplete records of date of users of hunting grounds in this table are not shown the contingent and hunted numbers of pheasant game. Also, in the available records of the harvested game, the distinction between hunters-tourists and local hunters has not been made.

Table 3. Overall number and number of harvested game in the period of 2006 – 2010.

Place		Deer		Rabbit	
	Year	Contingent	Hunted	Contingent	Hunted
Srbobran	2006.	335	44	2650	700
	2007.	392	44	3100	910
	2008.	468	60	3300	1030
	2009.	424	33	4805	
	2010.	541	32	3488	449
Becej	2006.	640	71	7134	588
	2007.	616	76	6910	802
	2008.	680	75	7905	804
	2009.	675	70	7134	588
	2010.	807	76	5360	534
Ada	2006.	395	38	2250	430
	2007.	403	41	2400	515
	2008.	512	44	2400	624
	2009.	694	29	2430	433
	2010.	793	45	2650	571

Source: Hunting association of Vojvodina (according to: Kurjacki – master's thesis)

4.7. Hunting and rural development

The main intention of the modern social and economic courses is a complex development on the basis of the available natural, financial, infrastructural and human resources, in accordance with the necessity to maintain a balance between nature and man, which is defined as "sustainable development." From the aspect of rural areas such development is defined as "rural development" which can be defined as an integrated, territorially rounded rural economy, which consists of a set of interrelated economic activities and other activities, which in addition to primary agricultural production includes manufacturing, forestry, hunting , fisheries, water resources, trade, tourism, craftsmanship, and numerous activities related to regional planning, education and continuous training, protection of human health and ecological balance (Maksimovic, 2010).

Rural areas are rich in biodiversity and ecosystems, so that from that point of view hunting or hunting management may represent a significant contribution to rural development, by the economic as well as social and ecological aspects.

Pursuant to all above mentioned, as well as to the existence of century-long tradition of hunting and hunting ethics in Backa, hunting itself has significantly improved over the recent years. Progress is measured through two major segments of the hunting industry:

- increase in population of high quality cultivated species of wildlife
- hunting tourism promotion, primarily through better marketing access to foreign markets.

There is the necessity of diversification of agriculture in rural areas, while meeting the need of introducing various economic activities in the agricultural activities of households, which thus gain the possibility of additional revenue. The travel industry, or hunting tourism as its selective form, may represent the quickest and most economical way of rural development. So, hunting, or hunting tourism, as one of the most promising tourist industries, represent a possible crucial factor in the development of rural areas, rich in many species of wildlife, unspoiled nature, organic farming, especially where farm and agro-tourism have already been developed over the last twenty years (Dernoi, 1983.; Marsden and Sonnino, 2008)

5. Hunting tourism as a function of rural development

5.1. The concept and basic characteristics of hunting tourism

In the literature there are few relevant definitions of hunting tourism. It seems that the most acceptable is that which under this form of economic activity involves "moving and active staying of tourists-hunters in a specific environment-hunting area, as a part of a healthy natural environment, for hunting (shooting, capturing, watching or recording) game, allowing his actors (hunters-tourists) to satisfy a strong motive (primarily a hobby, leisure activity for some and passion for others). At the same time they pay a fee for the shot game (trophies, meat, leather, etc..), accommodation and food in adequate tourist facilities, and other contracted services, following the valid price lists" (Prentovic, 2008.).

Specificity of demand in hunting, as compared to other forms of tourism, is in its multiple layers, which is based on the specific needs of tourism-hunters, and those are, in addition to hunting, active leisure and recreation; staying in a healthy natural environment; enjoying the natural beauty or the exotic ambience of hunting areas with specific biocenosis and attractive species of flora and fauna, education for successful hunting-tourism activities, etc.. On the other hand, the hunting-tourism product[12], in addition to various and trophy valuable hunting game, assumes other types of services, and above all: accommodation, food, transportation, educational services, cultural-animational and recreational conditions and activities, and others.

As a segment of hunting, hunting-tourism is closely associated with a number of economic and non-economic activities, especially with forestry, agriculture, water management, sports, education, science, and others. This is so because the hunting-tourism in the process of creating a ``product`` leaning on the resources of these area. So, for example, forestry, agriculture and water management provide for hunting, and through it also for hunting-tourism, the necessary spatial and environmental milieu for the existence of wild life, as a main motive of hunting-tourism recreation, which also represent the grounds for carrying out tourism hunting as a major segment of hunting-tourism offer. The listed non-economic activities provide the elements for completing the hunting-tourism offer by including sports facilities, educational, cultural-performances and of scientific-professional character. Hunting-tourism

12 Details on hunting tourism product is discussed in Prentovic (2005, p. 103-161)

gives something back to these (economic and non-economic) activities by enabling them to share in the distribution of income earned through the hunting-tourism sale. Being a part (a segment, selective form) of tourism, hunting-tourism is correlated with industries such as catering, transport, trade, crafts and other. This is because in the structure of the hunting-tourism product lodging services, meals and transportation of tourist-hunters, the supply of various essential items (weapons, ammunition, equipment), souvenirs and providing them with certain services (repairing weapons, equipment, etc..) comprise a significant part of hunters' activities.

5.2. Correlation of hunting and rural tourism

The term ``rural tourism`` has been accepted by the European Union, and as such it applies to all tourism activities in rural areas (according: Lazic and al., 2007). More specifically, it is ``a wide range of activities, services and pleasures provided by farmers and peasants in order to attract tourists to their area in order to create additional income`` (same source). As defined by the WTO (2004.) rural tourism is a complex composed of several segments: natural, rural environment (rivers, lakes, forest), rural cultural and spiritual things (architecture, churches and monasteries), ethno tourism (traditional food, music, customs) and rural activities such as horseback riding, fishing, hunting (Molera and Albaladejo, 2007.).

According to Vujovic et al 2011, economic theory and empery treat tourist as consumer. Economy creates economic behaviour of each person - tourist. Free time and free money resources as two basic initiators in tourism, tourist as consumers realize according to economic activities. Developmental aspects of tourism from the aspect of individuals as consumer-tourist, considers spending of available financial assets and free time, as well as income if person is on side of offer.

Additionally Gajic (2009) found that generally region of Vojvodina has never characterized for mass tourism, although that is a branch of economy which could be potential solution for many problems, before all unemployment. It's known that number of tourists in Vojvodina is not in proper correlation with all anthropogenic and natural resources.

In accordance with the principle of diversification of the economy in rural areas, dealing with tourism can be a very significant segment of the development of local communities (Komppula, 2004.). Rural tourism is the tourism rural areas with all activities that are carried out in there. Nature is the main resource for the development of rural tourism. By the introduction of new non-agricultural activities (especially of rural tourism) additional income can be obtained that will enable the improvement of the quality of life and stop the demographic decline in rural areas (Courthey et al., 2006.). The Tourism Development Strategy of the Republic of Serbia for the period from 2005 to 2010, sets the rural tourism among its medium and long term goals. Rural tourism is treated as an additional important economic sector, which will improve and ensure the sustainable development of rural communities, in order to generate additional income

to the rural population, comprising a number of tourist attractions, services, secondary activities that are provided by rural residents and private households.

Rural tourism includes a wide range of activities, services and pleasures provided by farmers to attract tourists to their area in order to create additional revenue (Hall, Kirkpatrik and Mitchell, 2005.). It serves to stimulate economic growth, increase the possibility of underdeveloped areas, and to improve the living standards of the local population. Rural tourism seems to be a suitable tool for revitalization of abandoned rural areas and ensures their sustainability in the future, by keeping jobs or creating new jobs, increasing the diversity of professions, landscape and nature conservation or support the preservation of rural crafts as a tourist attraction (Brandt and Haugen, 2010.). Rural tourism is often considered a form of tourism that is inherently sustainable, that attracts few visitors, that he does not need a large infrastructure development, and in which tourists are usually genuinely interested in the local culture and tradition. However, if we analyze farm tourism a little more deeply, there are also doubts over the sustainability. The most significant effect that should be explored is the economic profitability of rural tourism services. In fact, the demand is often seasonal, the occupancy rate is low and investments that are required to create or improve facilities for tourists are often high (Getz and Carlsen 2000, Deller, 2009.).

Although rural tourism is seen as an important and promising form of tourism in our country, Kurjacki found that the rural population in Backa is sufficiently interested in providing this type of tourism services (2011). The exceptions to this are households on Backa farm households, which accept rural tourism also dealing with eco and ethno tourism. These households are also known for the production of healthy food in natural conditions and mostly attract a clientele from economically developed countries.

These farm households have preserved environmental values, furniture and memorabilia from the early days of their creation, and they are suitable for active vacation, recreation and fishing, because they are located near waterways. A few households are able to receive tourists. Special feature of this ``farm household`` tourism is reflected in the possibility of preparing food in the old, traditional way, in ``peasant-made, simple`` ovens. For the tourists, hosts organize ``disnotors'', meaning the slaying of pigs, drying meat, making potato quishes and traditional fruit pies and other special dishes of Vojvodina. Hunting tourism, in addition to shooting game and other hunting activities, also has other motivational factors, and contents such as: culture, entertainment, education and other appropriate activities.

Hunting and rural tourism are multiply connected and intertwined, despite the fact that some authors consider hunting tourism an integral segment of rural tourism. Their correlation lies in the fact that their, largely overlapping part, destinations mostly located outside of urban areas, on the one hand, and that their services or activities are carried out in direct contact with nature and through direct use of natural resources, on the other hand. Association of hunting and rural tourism, accept in the physical sense, implicitly, is also present in the utility, receptive segment, potentially. On the other hand, correlation

and complementarity of these two selective forms of tourism, the potential and the real one, are, also, manifested in the domain of supply and demand, as well as in the provision of tourism services.[13]

5.3. Profitability of hunting in observed hunting areas

To determine the profitability of hunting area, as well as to acquire the knowledge whether its economic benefits justify the investment in its future development, the financial statement data of three hunting area users were collected over the five year period (from 2007. to 2011), (Table 4.) and made the *cost-benefit analysis*.[14]

Table 4. Income and Expenses of hunting ground users (in RSD)

Place	Year	Income	Expenses
Srbobran	2007.	1.504.475	1.034.119
	2008.	1.699.350	1.022.850
	2009.	1.422.697	1.005.691
	2010.	1.902.303	1.658.593
	2011.	2.235.200	1.923.500
Becej	2007.	1.657.810	747.619
	2008.	3.597.342	1.421.830
	2009.	2.424.242	1.948.119
	2010.	4.906.549	2.378.055
	2011.	4.985.200	2.875.230
Ada	2007.	2.076.831	1.232.441
	2008.	2.125.721	1.382.743
	2009.	2.283.552	886.189
	2010.	2.848.022	1.180.654
	2011.	2.975.000	2.258.000

Source: Financial statements of hunting clubs from Ada, Becej and Srbobran

Revenues of users of hunting areas mainly consist of revenues from hunting area management, revenues from membership fees and other activities. The revenues from hunting area management are part of the membership of local hunters, the fee for the shooting of wildlife, both resident hunter-tourists, and foreign, income from selling trophies and meat from hunted game, and selling live animals, other direct revenue in hunting tourism (compensation for the organization of hunting for transportation, room and feeding) and others. Membership fees of hunters are divided. One part is for the functioning of the hunting club and other hunting associations, as well as part of the compensation for

13 Detailed correlation of hunting and rural tourism is considered in Prentovic (2008.b.p. 110-121). Otherwise, the space allotted for the writing of this study does not permit a more detailed elaboration of these thesis

14 *Cost-benefit analysis* is a method for determining the profitability of businesses based on their income and expenses, as well as for making investment decisions, which influences the development of specific region of the community or society as a whole (Ivanis, 2010.)

the shot game and for the need to invest in material assets in the hunting area. In addition to these, the most basic resources, revenue is gained by implementation of other, non-core, business activities, for which they are registered HC (Hunting Club) (archery, catering, real-estate, sport and music events, cultural events and other, as well as donations and sponsorships). The expenses of HC include buying and the import of pheasant chicks and adult pheasants, the cost of their care and feeding, as well as other wildlife, the investment and current investments in hunting areas, hunting tourism costs of implementation, the cost of terrain vehicles, the cost of professional services and hunting guard services, and a fee to the state for the use of wild animals. From the table it can be concluded that the revenue (depending on the amount of investment) is significantly higher than the expenditures of the hunting area, and that, as it is indicated by direct economic indicators, users of hunting area have positively operated over the last five years.

6. Conclusion

It is undisputed that hunting, which is correlated with other rural activities, is an important economic activity in rural areas in Backa and also represents a significant opportunity for development of the area. In order for this development opportunity to be realized, it is necessary that versatile and integrated engagement of a large number of subjects not only on local, but also at the provincial and national (state) level, in order to prevent and eliminate certain limiting phenomena, and the following in particular:

1) Illegal hunting and poaching, the negative impact of predators on game, intensive agricultural production, water economy (plastic materials clogging the irrigation facilities), industrial production (contamination of soil, water and air by emissions of waste materials), transport, natural disasters, biological agents (inducers and vectors of infectious diseases and others[15];
2) The damage that game passes to crops and forest stands;[16]
3) Stimulating and motivating rural households to deal with, among other things, certain rural tourism activities, especially the cottage industry in the area of accommodation and meals for tourists, and therefore hunting tourists;
4) Affairs like ``Balkan birds``[17] and the illegal trade of various kinds of game
5) Joint participation of hunting area users, hunting and tourism organizations, as well as local government authorities in promoting and sale of tourism products of the providers of hunting and rural tourism, and the possibility of linking and integrating (starting from

15 About that more detailed is discussed in: Prentovic, R. and Bradvarovic, J. (2008)

16 About that more detailed is discussed in: Prentovic, R. (2006), p. 113-121

17 About that more detailed is discussed in: Puzovic (2002)

the common needs of their clientele[18]), in the domain of tourism demand, as well as in the field of tourism offer, or the provision of tourism services[19], etc..

In order to create optimal conditions in the modern transitional phase our country is going through, to achieve the complete and integrative connectivity and cooperation of the workers in hunting and rural tourism in our rural areas and a better integration of hunting tourism in the process of their development, it is necessary to create the conditions in which not only could the relevant economic and local community subjects be successfully coordinated, but (to the same end) other government institutions of interest for hunting and tourism would be involved and integrated. The same applies to the local government, tourist and hunting organizations, as well as to other interested subjects not only within the local community, but in the region of the Province of Vojvodina and the Republic of Serbia.

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18 It seems that the common needs that determine the demand of potential hunting or rural-tourism clientele those in states of Loren (according to Lazic and others, p. 76) as follow: a) the need for nature, ie. need to live in symbiosis with the original environment, even for a short time; b) the need for the activity or motive for expression of behavior that provide pleasure and enjoyment, and c) the need for playing

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LOVSTVO U RURALNIM PODRUČJIMA BAČKE

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Sažetak

Cilj rada je da se utvrdi da li je lovstvo, i sa kojim delatnostima u ruralnim područjima, u korelaciji i da li, kao takvo, može doprineti razvoju ruralnih zajednica u Bačkoj. U radu su korišćene metode: terenskog rada (sistematsko posmatranje i intervjuisanje), analiza (literaturnih i dokumentacionih) sadržaja i dr. i statistička metoda. Istraživanjem se došlo do saznanja da je lovstvo, koje je locirano u celosti u ruralnim područjima, a koja su, zapravo, i jedini lovni prostori odnosno staništa lovne divljači, značajna i profitabilna oblast privređivanja, a da je lovni turizam kao najpropulzivniji segment lovstva, u korelativnom i komplementarnom odnosu sa ruralnim turizmom u Bačkoj. Da bi se ostvarila još bolja integrisanost lovstva u intencije ruralnog razvoja Bačke neophodno je predupredіti i otkloniti delovanje određenih limitirajućih činilaca.

Ključne reči*: Bačka, lovstvo, ruralna područja, razvoj.*

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THE NUTRITIVE AND ECONOMIC EFFECTS OF AEROBIC TREATMENT OF SOLID MANURE

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Summary

The aerobic treatment of solid manure increases the content of total and easily available amounts of N, P_2O_5, K_2O by 3.76 times on average in comparison with raw solid manure, and makes the maturation time eight time as short, which is significant for several reasons. In this paper, we showed that the price of the substitution of compost derived from aerobic processing is 4.24 times as high in comparison with the price of the substitution of burnt manure derived through anaerobic processing. By applying different dynamic methods for the assessment of investments, a fact was established that investing in the purchase of a machine for the aerobic processing of manure is economically justified and financially acceptable for farms with 19 and more cows.

Key words: *Aerobic treatment, manure, effects, economic justification*

JEL: *Q55*

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Introduction

The procedures of the treatment of solid manure should solve the following problems: the problem of the recycling of pathogens present in animal excrements and bedding; the problem of the recycling of weed seeds resistant to physiological processes in the animal intestinal tract and the process of raw manure fermentation; the problem of the size of the space for the fermentation of raw manure and the storing of mature manure until it is used; the reduction in the consumption of energy for its treatment during fermentation, transport to and distribution on an agricultural plot.

Technical-technological solutions of the means and procedures of the aerobic treatment of manure generate the possibilities of the quick transformation of the present mineral and organic matter into forms easily available to plants. In that manner, the dynamics and intensity of exploiting mineral matters significantly increase. That is what makes the first significant factor of this form of treatment. The second aspect is observed in the significant shortening of the procedure of the maturation of manure, by reducing it from 260-345 days to approximately 45 days (Radivojević, 1993).

The aim of the research is to determine the nutritive values of compost derived from the aerobic treatment of manure as well as the economic effects of manure treatment, in two ways – through the growth of the compost value in comparison with compost derived from anaerobic processing as well as through the assessment of the economic effectiveness and financial acceptability of investing in the purchase of a machine for the aerobic processing of manure.

The material and the method

For the procedure of the aerobic treatment of manure, the self-propelled machine KOMPO MAT – 1, a prototype, was used. The treatment of manure was performed periodically, for the duration of seven weeks (49 days). The dry matter content in raw manure was 22% on average at the beginning. Raw manure was deposited onto the concrete plateau in prismatic piles 3 m wide and 0.8 m high. The length of the prisms is not substantially significant for the treatment. In that time period, each prism was treated 12 times. The work speed of the machine was changed in the interval from 0.1 to 0.7 km/h, (on the 70-m prism-length route, time was measured, and the movement speed was calculated). Raw manure (secretion and wheat straw in the 7lit.:1kg ratio) was formed in the stable in the channel for discharging manure. The initial properties of raw solid manure, whose total mass was 800 t at the moment when it was being introduced into the process of aerobic treatment, are accounted for in (Table 1.).

Table 1. Physico-chemical properties of crude solid manure at the beginning of aerobic care process

Water content (%)	Mineral matter (%)	Organic matter (%)	pH	N (%)	P_2O_5 (%)	K_2O (%)
78.34	2.77	97.22	7.72	0.77	0.36	0.46

During the aerobic treatment of manure, we observed changes in the content of mineral and organic matter in the manure mass; changes in the content of macro-elements; changes in the fertilization properties of manure; the physical and nutritive properties of compost derived from the aerobic and anaerobic fermentation of raw manure (Radivojević et al. 2002a, Radivojević 1996). In order to gain an insight into the economic effects of the aerobic processing of manure, first, the price of the substitution of the compost derived from the aerobic and anaerobic manners was calculated. For that purpose, appropriate mineral fertilizers and their market prices were used, in compliance with the methodology quoted by (Gogić 2009). Then (on the basis of differential calculations) appropriate indicators for the assessment of the economic effectiveness of investing in the purchase of a machine for the aerobic treatment of manure (the net present value, the internal rate of return, the payback period) were calculated for a different number of cows on the farm. Using the mentioned methods, we determined the smallest number of cows on the farm that economically justifies the purchase of the analyzed machine. The paper also analyzes the liquidity (financial acceptability) of this investment by comparing the net cash flow from investment and the amount of the annual annuity.

The results and discussion

During the aerobic processing of manure, a change in its fertilization properties occurred. At the beginning of aerobic treatment, there was 21.66% of dry matter in the total mass of raw solid manure. In the mass of dry matter, there was 97.22% of organic matter and 2.77% of mineral matter. The dry matter content in the amalgamated mass was 25% on average at the beginning of the procedure (Radivojević et al. 2002b). Aerobic fermentation reduced the amount of organic matter by 10.93% (Table 2), and, at the same time, increased the content of mineral matter by the same. Such mineralization of organic matter increased the total content of nitrogen, phosphorus and potassium 3.76 times (from 15.9 to 59.4 kg/m^3), i.e. increased the total nitrogen by 12.7 kg/m^3, total phosphorus by 13.6 kg/m^3, and total potassium by 16.5 kg/m^3 (Table 3).

Table 2. Changes of manure fertilizing properties during aerobic fermentation

Weeks of Care	Water (%)	Dry Matter		pH	Macroelements (%)					
					N		P_2O_5		K_2O	
		Min.mat. (%)	Org.mat. (%)		Total	Soluble	Total	Soluble	Total	Soluble
1	78.3	2.77	97.22	7.92	0.77	0.16	0.36	0.29	0.46	0.27
2	77.6	3.51	96.48	8.31	0.69	0.17	0.36	0.30	0.54	0.31
3	71.6	4.82	95.18	8.75	0.90	0.20	0.46	0.41	0.69	0.34
4	63.3	6.89	93.11	8.79	1.08	0.10	0.73	0.66	0.98	0.54
5	58.2	8.57	91.41	8.74	1.09	0.07	0.80	0.49	1.03	0.55
6	51.4	10.23	89.71	8.46	1.65	0.08	1.50	0.95	1.35	0.59
7	39.0	13.71	86.71	8.31	2.04	0.08	1.79	1.6	2.11	0.61

Apart from that, aerobic fermentation also increased the content of easily available phosphorus by three times, easily available potassium by two times, while the content of easily available nitrogen was reduced by two times, because of the evaporation conditioned by high temperatures during the thermalphilic stage (Table 2). During the conducting of the process of treatment, differences in changes of the most important parameters of composting, such as the physical and nutritive changes in the mass aerobically treated and the mass not subject to aerobic treatment (control) (Table 3), were monitored.

Table 3. Physical and nutritive properties of compost obtained by aerobic and anaerobic crude manure fermentation

Type of fermentation	Fermentation duration	Volume mass (kg /m³)		Water content (%)		Macroelements in compost						
		Raw manure	Compost	Before fermentation	After fermentatio	N		P_2O_5		K_2O		Total NPK
						%	(kg/m³)	%	(kg/m³)	%	(kg/m³)	(kg/m³)
Aerobic	42-49	800	350	78.34	39.01	2.04	71.40	1.79	36.26	2.11	73.85	181.51
Anaerobic	260 - 345	800	870	78.34	72.00	0.4	17.5	10.5	10.5	0.6	21.0	49.00

To determine the values of the compost derived from the aerobic and anaerobic methods, we used the substitution price method. The nutrient matters contained in the compost (nitrogen, phosphorus and potassium) were assessed pursuant to their substitution price from mineral fertilizers. Simultaneously, the market prices for mineral fertilizers as of April 2012 were used for that purpose (Table 4). On the basis of these initial data, as well as the data presented in (Table 2, the substitution price for 1 ton of compost derived from aerobic processing (Table 4) and anaerobic processing (Table 5) was fixed. The initial data as well as the data presented in Table 2 fixed the substitution price for 1 ton of compost derived from aerobic processing (Table 5) and anaerobic processing (Table 6). On the basis of the result in Tables 5 and 6, we can conclude that the substitution price for compost derived from aerobic processing is by 4.24 times as high as the substitution price for compost derived from anaerobic processing. However, in order for us to gain a complete and full insight into the economic effects of the aerobic processing of manure, it is needed that we should gain an insight into costs incurred in that way, too, not just an income growth.

Using the data accounted for, differential calculations for the purchase of a machine for the aerobic processing of manure, and for cattle farms of different sizes (15, 20 and 25 cows), were made. For each farm size, the differential calculation was made as per individual years (for a seven-year time period), which was the basis for determining the economic effectiveness and financial acceptability of investing in the purchase of the observed machine.

Table 4. The types and properties of mineral fertilizers for substitution

Type of fertilizer	Content of nutritive matter (%)	Fertilizer price (EUR/kg)
Nitrogenous (UREA)	46	0.46
Phosphate (0:20:0 Fertil)	20	0.35
Potassic (Potassium sulfate)	50	0.94

Table 5. The substitution price for 1 t of compost derived from aerobic processing

Type of nutritive matters	Content of nutritive matters in 1 t of compost (kg)	Needed amount of mineral fertilizers for substitution (kg)	Price of fertilizer (EUR/kg)	Substitution price for 1 t of compost (EUR)
Nitrogen	20.40	44.35	0.46	20.40
Phosphorus	17.90	89.50	0.35	31.33
Potassium	21.10	42.20	0.94	39.67
Total substitution price for 1 ton of compost				91.39

Table 6. The substitution price for 1 t of compost derived from anaerobic processing

Type of nutritive matters	Content of nutritive matters in 1 t of compost (kg)	Needed amount of mineral fertilizers for substitution (kg)	Price of fertilizer (EUR/kg)	Substitution price for 1 t of compost (EUR)
Nitrogen	5.00	10.87	0.46	5.00
Phosphorus	3.00	15.00	0.35	5.25
Potassium	6.00	12.00	0.94	11.28
Total substitution price for 1 ton of compost				21.53

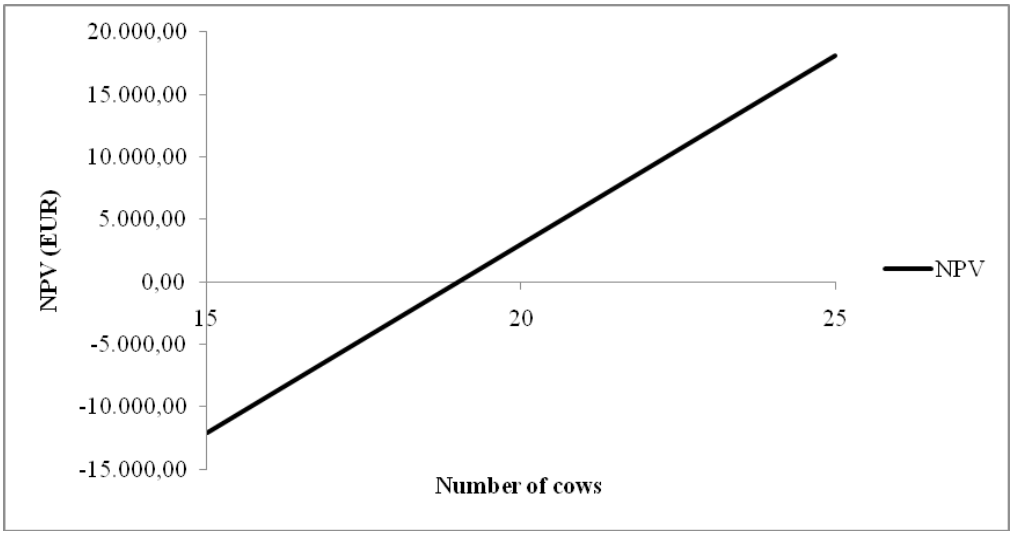
The economic effectiveness of the investment was determined by using the net present value method, the internal rate of return method and the payback method. These methods are the most significant ones in the theory and practice of assessing long-term investments. In case these methods generate opposite results when opting for one of several alternative investments, a priority should be given to the net present value method since (Andrić et al 2005) multiple internal rates of return, bearing no practical significance, can be calculated. As it is stated (Đuričin 2006), the net present value can be accounted for "via a difference between the current value of cash inflows and the current value of cash outflows".

In order to determine the costs of the machine's work for the aerobic processing of manure, as well as in the case of the determination of the economic effectiveness of investing in the purchase of a machine, the following parameters were considered at the beginning: The value of the machine is at 36,000 EUR; The machine's liquidation value is at 3,000 EUR; The usage life of the machine is 7 years; The consumption of fuel (Diesel D-2) is 9 liters per one working hour; The price of the diesel fuel is 1.4 EUR/l; The consumption of lubricants is 5% of the fuel value; The cost of work of a worker is 3.41 EUR/hour; The annual costs of the technical maintenance of the machine are estimated at 12% of the purchase value of the machine; The annual costs of accommodation are at 0.5% of the purchase value; The machine insurance costs are determined in accordance with the legal regulations of the mandatory insurance of agricultural machines at their registration; The annual amount of depreciation is calculated by using straight-line method; The costs of interest per individual years are determined under the conditions of the purchase of the machine for the aerobic processing of manure, financed 50% from equity and 50% from a loan; The loan repayment term is 7 years, the interest rate is 12%, and the loan is repaid in equal annual annuities; For a part of own funds (equity), there is a projection of the interest rate at the amount of opportunity costs (a 5% interest rate on savings deposits with banks); On the basis of the manners and conditions of financing, an 8.50% weighted average cost of capital (WACC) discount rate used for the assessment of the economic effectiveness of an investment by means of dynamic methods is determined; Incomes generated by the purchase of the machine are determined as a difference between the value of compost derived from aerobic processing (after the purchase of the machine)

and compost derived from anaerobic processing (prior to the purchase of the machine); When prices for mineral fertilizers are fixed, incomes from the purchase of the machine depend on number of cows on the farm.

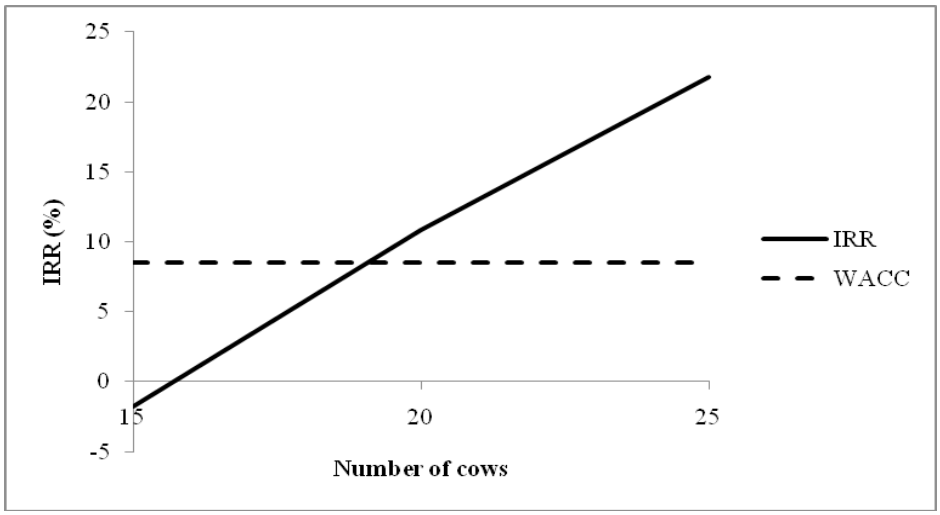
The net present value method justifies the investment on condition that the stated indicator is higher than zero. It can be observed that, when there are 15 cows on a farm, the investment is not economically justified, whereas on a farm with 19 cows, the net present value is equal to zero, which means that this number of cows is the bottom line of economic acceptability for the purchase of the stated machine. On farms with 20 and more cows, the net present value is higher than zero, so the investment in the purchase of the analyzed machine is economically justified (Graph 1.)

Graph 1. The net present value for a different number of cows on a farm



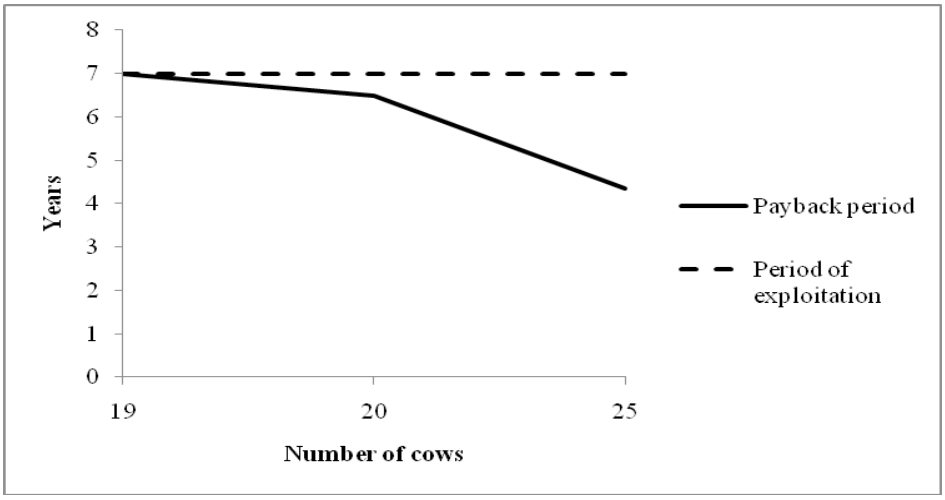
The same conclusion is also reached when applying the internal rate of return, whose amount is compared with an appropriate discount rate (WACC), which, in this case, is 8.50% (Graph 2.). The investment is economically justified if the internal rate of return is higher than the discount rate. It can be observed that, when the purchase of the analyzed machine is concerned, the internal rate of return is equal to the discount rate for the farm size of 19 cows, i.e. it is the point of the economic effectiveness of the investment, which matches the solution generated by the net present value method.

Graph 2. The value of the internal rate of return for a different number of cows



The payback period is considered to be an ancillary method which, in a certain way, expresses the risk of long-term investments (Jackson and Sawyers, 2003), and its results are accounted for in (Graph 3.).

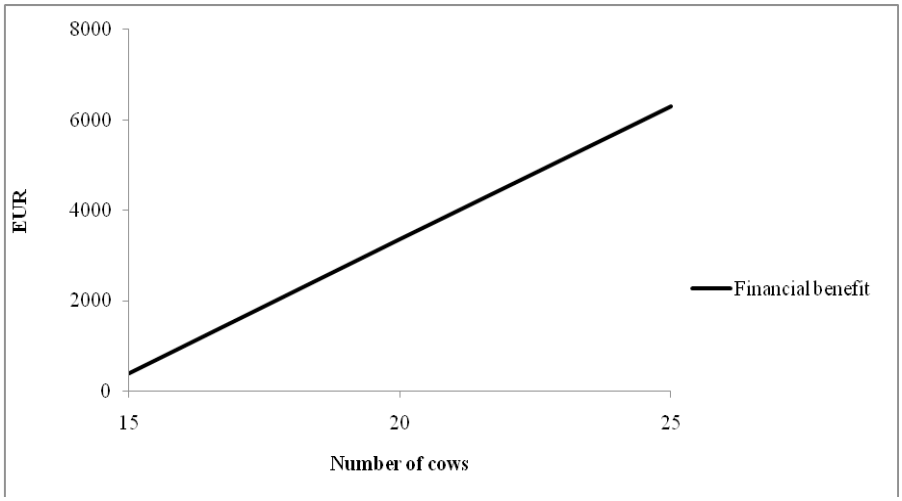
Graph 3. The payback period of the investment for a different number of cows on a Farm



Having in view the results generated through the previous methods, it is obvious that the payback period of the investment for farms with fewer than 19 cows is longer than the time period of its exploitation (7 years).

If there are 20 cows on a farm, the payback period is 6.48 years, whereas on farms with 25 cows, the payback period of the investment is 4.36 years. The investment is liquid (financially acceptable) if its financial benefit is more than zero (Graph 4.). At the same time, a financial benefit is defined as a difference between the net cash flow from an investment and the annual annuity for loan repayment.

Graph 4. The amount of the financial benefit from the investment for a different number of cows on a farm



It can be observed that the financial benefit from the investment for all observed sizes of a farm is above zero, i.e. the investment is financially acceptable. It is the case even with those farms where there are fewer than 19 cows, which means that even suchlike farms would be able to pay back a loan for the purchase of the analyzed machine, although their purchase of the machine would not economically be justified. This is the case because the purchase of the machine has been assumed not to be made fully from the loan, and that only 50% of its value is financed in this way.

It is important to know that it is possible to pay back a loan for the machine because Petrović et al. (2011) determined that most of the farmers consider financing as the most significant barrier for purchasing of machinery. On the other hand, on the basis of research of family dairy farms, Ivanović et al. (2008) concluded that farms which have the biggest total investments in contemporary technical and technological systems achieve more favorable business results. But such investments are impossible without favorable (subsidized) loans.

Conclusion

The analysis of the aerobic processing of manure by means of an appropriate machine (prototype) for that purpose revealed that the process of the aerobic processing of

manure lasts for seven weeks, which is several times as fast as classical anaerobic processing. Also, it was determined that, during aerobic fermentation, and compared with raw solid manure, there is an increase in the total content of nitrogen, phosphorus and potassium 3.76 times. The paper reveals that the substitution price for compost derived from aerobic processing is 4.24 times as high as the substitution price for compost derived from anaerobic processing.

By applying different dynamic methods for the assessment of investments, a fact was established that investing in the purchase of a machine for the aerobic processing of manure is economically justified and financially acceptable for farms with 19 and more cows. So, on a farm with 20 cows, the payback period is 6.48 years, and, if a farm has 25 cows, the payback period is only 4.36 years (while the exploitation life of the machine is 7 years).

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NUTRITIVNI I EKONOMSKI EFEKTI AEROBNE NEGE ČVRSTOG STAJNJAKA

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Rezime

Aerobnom negom čvrstog stajnjaka povećava se sadržaj ukupnih i lako pristupačnih količina N, P_2O_5, K_2O, u odnosu na sirovi čvrsti stajnjak prosečno za 3,76 puta, a vreme dozrevanja skraćuje osam puta što ima višestruki značaj. U radu je pokazano da je cena zamene komposta dobijenog aerobnom obradom 4,24 puta veća u odnosu na cenu zamene zgorelog stajnjaka dobijenog anaerobnom obradom. Primenom različitih dinamičkih metoda za ocenu investicija utvrđeno je da je investicija u nabavku mašine za aerobnu obradu stajnjaka ekonomski opravdana i finansijski prihvatljiva za farme koje poseduju 19 i više krava.

Ključne reči: *Aerobna nega, stajnjak, efekti, ekonomska opravdanost*

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SUSTAINABLE DEVELOPMENT OF THE FARMERS' COOPERATIVE SYSTEM IN AP VOJVODINA

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Summary

On the basis of the systematization of relevant attitudes predominant today with respect to sustainability at the global level, the authors have made a concept of a questionnaire, carried out a survey and paper-presented the results of their research into the attitudes of directors of farmers' cooperatives regarding the socio-economic, legal and ecological aspects of the sustainability of the cooperatives system as "the third sector" of the economy and rural areas in the Autonomous Province of Vojvodina, with a reference to the legal, economic and ecological ambience of business doing performed by cooperatives and other enterprises in the Republic of Serbia – with a special reference to obligations which, when sustainability is concerned, emerge from the need for harmonizing with the European Union's legislation.

Key words: *sustainability, social entrepreneurship, social responsibility, farmers' cooperative system, Vojvodina*.

JEL*:* Q12, Q 32 , Q 57

1. Introduction

The term "sustainability" takes a significant place in the strategies of an ever-increasing number of economic subjects, as is accounted for in the annual UN Global Compact Research (UNGC) conducted in 2010.

Sustainability has greatly evolved from the determinant of "the character of an

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economy as an assistant to the human race and nature, rather than vice versa" (E. F. Schumacher, 1993). Researchers investigating sustainability today believe that the issues determining this concept are of the key importance not only for the future of the ecology of this planet of ours but the present and future successes of the overall economy as well (UNGC, 2010).

In practice, the application of efficient and permanently sustainable strategy of the development of cooperative business is reduced to the following two key questions:

- How do cooperative leaders understand their task and act according to the task?
- How does the way cooperative leaders understand the task match what is really needed for sustainable cooperative business and the cooperative sector of the agro-economy?

If managers in cooperatives are not in full control of the maintenance or destruction of today's and tomorrow's human and natural resources, they can be considered to have a big influence on the creation of sustainable cooperative system and economy in general, especially in rural areas.

The general definition of "economy" is simple: "a system of production, distribution and consumption" (Wordnet, 2010); however, the impact of business which it is exposed to is certainly not simply understandable and clearly defined.

A big change is necessary from "doing business as usual" to the creation of a global economy that will be committed to, rather than opposing to, a long-term sustainable future. A radical approach to development and practical changes within the current manner of business doing is needed. For that reason, starting with incomparably more comprehensive researches in the sustainability of economy in general, this paper should formulate and provide answers to the following questions and dilemmas in the development of a sustainable cooperative sector of agro-economy in Serbia:

- What should a sustainable economy look like from the aspect of the cooperative sector of agro-economy?
- What does the current model of the cooperative sector of agro-economy represent and how is it compared with the idea of a sustainable economy?
- How big is the gap between ideal and real in the sector of the farmers' cooperative system?

While formulating the above stated, the following questions should be paid special attention to:

- What is the role of the farmers' cooperative system in the creation of a sustainable economy from the perspective of the agro-business sector?
- What has been done so far to achieve a sustainable cooperative sector of agro-economy in practice?
- How to assess what it is we need to achieve a sustainable sector of the farmers' cooperative system in Serbia's agro-economy?

2. Research methodology

The research is based on the "mixed method", using quantitative methods to ensure accurate and confidential data through qualitative ideas and conclusions.

Three approaches have been used for that purpose:

Firstly, research includes directors of 40 farmers' cooperatives in the Autonomous Province of Vojvodina. The choice was made on the basis of the list of 100 most successful cooperatives out of 400 cooperatives in Vojvodina's agro-economy which – for the needs of the declaring of the best farmers' cooperatives performed by the Association of Cooperatives of Vojvodina in 2010 – was prepared by means of the software package prepared by informaticians from the "Baćo" Farmers' Cooperative, Vrbas, was used. The basic criteria for ranking the farmers' cooperatives were the following ones: the year of establishment (temporal aspect of sustainability); the number of members of the cooperative, sub-contractors and workers employed (quantitative aspect of the sustainability of human resources); size of the estate cultivated by the cooperative, the value of the property and the annual turnover of the cooperative (quantitative-qualitative aspect of the property-financial sustainability). The questions in the questionnaire are adapted to different levels of education and the managerial experience of the directors of the farmers' cooperatives, and are asked in such a manner to comply with the methodology used in scientific papers analyzing managers' attitudes in the non-agrarian sectors of the economy and in other countries as well, which the similarities and differences of attitudes regarding the sustainable future of the agro-economy's cooperative sector are compared with. The questionnaires with the filled-in answers to the asked questions were sent back by 31 directors of the farmers' cooperatives, which makes 7.26% of the total number of the farmers' cooperatives in AP Vojvodina – excluding those undergoing the bankruptcy proceedings. In order to ensure an appropriate comment and conclusions resulting from the analysis of answers in the filled-out questionnaires, the attitudes about the sustainability of the cooperative agro-business found in available literature and the proposals generated on the basis of the empirical knowledge of researchers investigating the cooperative sector of agro-economy in Serbia and the world are also additionally considered.

Secondly, in interviews, the following pieces of information are collected, especially those about the visions of cooperatives, their strategies on and activities in the promotion and application of sustainability. Both the primary and the secondary researches are set using, first of all, the following sources: Accenturov '2010 UN Global Compact Survey' (UNGC. 2010), the Economist's research (Economist Intelligence Unit. 2007) and 'McKinsey and Company' (Oppenheim et al. 2007). The sources have been selected to ensure the basic materials for covering socio-economic and ecological sustainability, on the one hand, and to provide a more detailed review of the business strategy and business performance, on the other. On the basis of that, gaining a holistic insight into the subject of the research is enabled.

Thirdly, in the paper, we also use the so-far-reached results of researching the sustainability of agriculture (Ševarlić, M., 1999, 2001, 2002, 2003. 2012), (Ševarlić, M., Vasiljević,

Zorica, 2003) and (Veljković, Biljana, Ševarlić, M., 2010), as well as recently intensified researches in the field of the cooperative system and, especially, the farmers' cooperative system in Serbia (Ševarlić, M., Krivkapić Skoko, Branka, Nikolić, Marija, 2007), (Ševarlić, M., Nikolić, Marija, Simmons, R., 2009, 2010), (Ševarlić, M., Nikolić, Marija, 2009, 2010, 2011-a, 2011-b, 2012).

Fourthly, by means of a comparative analysis of all the mentioned, we have confirmed the assumptions of the socio-economic, legal and ecological sustainability of the farmers' cooperative system in Serbia's agro-economy. We consider that this research offers a more detailed analysis of the state and perspective of the sustainable development of the farmers' cooperative system in Serbia. Due to a relatively small number of the surveyed directors of the farmers' cooperatives, the number of the selected indicators of sustainability is also reduced so as to gain an insight into the business trends within the researched sample. For that reason, the results of this research are compared with other researches, for the most part with those in studies gaining a broader insight into the problems of the sustainability of the economy.

The collected primary and secondary data, analyzed by means of descriptive statistics, the assessment of sustainability in business operations based on the values, strategy and business priorities of farmers' cooperatives in Serbia's agro-economy is made.

3. What does sustainability mean?

Today, expressions containing common characteristics, descriptions, relations and, most frequently, temporal determinants are frequently used. Their authors indicate the preservation of human and natural resources, describing their internal relations and the balance between them now and in future (Brundtland (1987), CPSL (2007), "Association of Certified Chartered Accountants" (2010) and "World Business Council for Sustainable Development" (2010). Out of these definitions, the definition contained in the "Dialogue on Economic Sustainability" in the Cambridge Programme for Sustainability Leadership) is the most appropriate one for our research. The definition contains an explanation which concisely describes the balance necessary for a "good economy": "The basic purpose of a good economy is to constantly enhance the welfare of all people now and in future, respecting rightfulness, nature's restraints, through an active engagement of all participants" (CPSL, 2007). This attitude also calls for a full engagement of the society, including the Government, the economy and citizens' associations.

4. Research

In this section of the paper, we account for the results of the research we have conducted in the selected farmers' cooperatives in Serbia's agro-economy, presenting the frameworks of sustainability on the basis of the statements produced by their respective directors and comparing them with what business firms should generally dedicate their efforts to in order to ensure sustainable development.

Once we have defined the core goals of a sustainable economy for the future and recognized the current economic restraints on the way towards it, on the basis of the results of the research (Table 1), we have assessed the fundamental activities carried out by the farmers' cooperatives which can make a contribution to a sustainable agro-economy and economy of AP Vojvodina and the Republic of Serbia.

Table 1. The attitudes of the directors of the farmers' cooperatives regarding sustainability

Item No.	Questions	Possible answers	Percentage
1	Do you think the sustainability issue will be of the key importance for the future success of the business operations performed by your organization?	Yes	46%
		Maybe	43%
		No	11%
2	Which of the following factors do you deem important for making a decision on commencing an initiative to solve some of the problems of sustainable development in the cooperative system and the development of rural areas?	Brand, trust and reputation	29%
		Cost reduction	16%
		Growth of incomes	11%
		Personal motivation	11%
		Engaging employees and employment to a greater extent	11%
		Impact of slow-downed social life on business doing	11%
		Political and legal environments	11%
		Pressure by investors/coop members	0%
3	Which of the stated issues of sustainable growth do you consider to be the most critical for the future success of your cooperative's business operations? You can claim more than just one.	Education	37%
		Poverty	26%
		Health	22%
		Climate changes	9%
		Lack of professionalism on the part of the state organs	6%
		Sex difference and non-discrimination	0%
		Social cohesion	0%
4	In the time period of next 5 years, which stakeholders' group do you think will have the biggest impact on sustainability-related decisions? You can claim more than just one.	Governments	21%
		The media	18%
		The employed	14%
		Workers' organizations and associations	14%
		Investors	8%
		Communities	8%
		Consumers	8%
		NGO organizations	5%
		Regulators	4%
		Suppliers	0%
		Boards and committees	0%
		Other	0%

Item No.	Questions	Possible answers	Percentage
5	Should these questions be completely incorporated in the strategy and business operations of cooperatives?	I agree very much	55%
		I agree	45%
6	Boards and committees should discuss and work on these issues?	I agree	49%
		I agree very much	31%
		I do not agree	10%
		I have no attitude to this issue	10%
7	Cooperatives should take care of those issues through their supply chain as well?	I agree	45%
		I agree very much	35%
		I have no attitude to this issue	12%
		I do not agree	8%
8	Cooperatives should be more active in the agro-economy sector, cooperation and partnership with all participants in attaining the sustainable development goals	I agree	46%
		I agree very much	43%
		I do not agree very much	11%
		I do not agree	0%
		I have no attitude to this issue	0%
9	What are the main obstacles in the implementation of an integrated and strategic approach to sustainability in cooperatives?	Failure to recognize values for all users	26%
		Lack of an efficient communications infrastructure	20%
		Complexity of strategy implementation	11%
		Lack of skills/knowledge of the middle – higher management	11%
		Different definitions and interpretations of sustainability	9%
		Lack of boards' support	9%
		Interpretation difficulties with external groups	5%
		Financial markets' failure to acknowledge sustainability values	5%
		Competitive strategic priorities	4%
		Employees' resistance	0%
10	Will governments and decision-makers increase their interventions regarding the sustainability issue?	I agree	43%
		I agree very much	29%
		I do not agree	14%
		I have no attitude to this issue	14%
11	My cooperative would welcome an increased aid by the government regarding the sustainability issue?	I agree	47%
		I agree very much	43%
		I do not agree very much	10%
		I do not agree	0%
		I have no attitude to this issue	0%

Item No.	Questions	Possible answers	Percentage
12	My cooperative will have an influence on the government to promote a sustainable future?	I have no attitude to this issue	39%
		I agree	33%
		I do not agree	17%
		I do not agree very much	11%
		I agree very much	0%
13	My cooperative will have an impact on the civil society to promote a sustainable future?	I agree	36%
		I have no attitude to this issue	32%
		I do not agree	16%
		I agree very much	16%
		I do not agree very much	0%
14	Should the government provide clear guidelines and be fully supportive of the sustainability concept?	I agree very much	26%
		I agree	26%
		I do not agree very much	26%
		I do not agree	13%
		I have no attitude to this issue	0%
15	Do the majority of consumers demand products complied with the sustainability principles?	I agree	49%
		I do not agree	25%
		I do not agree very much	13%
		I have no attitude to this issue	13%
		I agree very much	0%
		I do not agree very much	0%
16	Is there a need for the investor's estimation of sustainability in long-term investments?	I agree	67%
		I agree very much	25%
		I do not agree	8%
		I have no attitude to this issue	0%
		I do not agree very much	0%
17	Do you consider that the education system should be developing the knowledge and skills needed for future leaders in the cooperative system and the economy in order to enable them to face sustainability challenges in as efficient a manner as possible?	I agree very much	62%
		I agree	38%
		I do not agree very much	0%
		I do not agree	0%
		I have no attitude to this issue	0%
18	Do you deem yourself and the cooperative's management responsible for the attainment of sustainability goals?	I agree	30%
		I do not agree	30%
		I do not agree very much	10%
		I have no attitude to this issue	0%
		I agree very much	30%
19	Do you think you should take sustainability elements into consideration and include them when preparing financial reports?	I agree	60%
		I agree very much	25%
		I have no attitude to this issue	15%
		I do not agree very much	0%
		I do not agree	0%

Item No.	Questions	Possible answers	Percentage
20	Do you consider the recognition of a sustainability concept to be a critical differentiation in staff recruiting?	I agree	86%
		I agree very much	14%
		I do not agree	0%
		I have no attitude to this issue	0%
		I do not agree very much	0%

Source: The calculation made by the authors on the basis of the questionnaires received through researching the attitudes of the directors in the farmers' cooperatives in AP Vojvodina, in the time period from October to November 2011.

4.1. Education

What is needed? The NGC examination comes to a conclusion that 72% of the directors see education as an issue of the world's development which must immediately be responded to in order to ensure a sustainable future (UNGC, 2010).
What have we achieved? Our research is indicative of the fact that concerns of education (37%), poverty (26%) and health (22%) are the most important individual issues concerning the directors of our farmers' cooperatives.

Conclusion: Education is a global issue seen as the fundamental element of the development of a sustainable economy. The farmers' cooperatives also recognize the significance of this theme; however, they frequently invest their resources in education or training programs only to broaden their employees' professional capabilities within their respective cooperatives, and only rarely those of their cooperative members. Everybody agrees that there is a need for additional efforts to be made to reduce poverty; however, the most needed efforts are still those related to true and constant initiatives from within the society to create this goal.

4.2. The Government

What is needed? The UNGC review indicates that 39% of the company directors consider the government to be one of important decision-making factors influencing social expectations for sustainable business doing, whereas 24% of the directors deem the government's regulations to be the main motivational factors leading to sustainability (UNGC).

What have we achieved? Our research demonstrates similar results. The government can be observed as "inefficient"; however, 21% of directors considers Government significant in supporting decisions linked to sustainability of cooperative sector. However, given the problems of the unregulated status of the so-called "social property", the lack of the political will to reach a new act on cooperatives and the second question is whether the representatives of the Serbian Government are willing to be partners for enhancement of the sustainability of the farmers' cooperative system. If they joined forces in a synergy, they could direct their joint forces towards better results in sustainability not only in the farmers' cooperative system but also through the system and the entire agro-economy of Serbia.

Conclusion: The role played by the government in designing an appropriate framework and polices is predominant for the development of a sustainable farmers' cooperative system as a special ownership sector in the Serbian ago-economy and its entire economy. The activity carried out by cooperative leaders can and should be supportive of and encourage the government to increase the application of sustainability. One of the biggest challenges is the one of integrating farmers' cooperatives' long-term business plans in a relatively short-term nature of the government's political electoral cycles – especially when issues related to the associating of cooperatives in order to form cooperative enterprises as a form of vertical integrations in the field of the cooperative system intended for the elimination of numerous intermediaries in a chain "from the tilled field to the dining table" are concerned.

4.3. Long-term strategic planning

What is needed? The review of the UNGC indicates that certain directors believe that recession reduces the speed at which their sustainability strategies and activity plans could be realized, and the majority of them agree that recession has not disturbed their long-term plans in these fields (UNGC). The "Economist's Intelligence Unit" (2007) highlights the fact that companies believe that sustainability will be ensured by different and long-term competitive advantages.

What have we achieved? Our research reveals that there is a need for a precise assessment made by the investor and the government regarding long-term investing in the sector of the farmers' cooperative system. Even 67% of the directors of the farmers' cooperatives "agree" and 25% of them "agree very much" that value of the application of sustainability can contribute to business doing, building reputation and positioning the commodity brand of a cooperative product.

Conclusion: The directors agree upon the fact that the sustainability of the farmers' cooperatives in AP Vojvodina is closely connected with the long-term planning of long-term investments and believe that it can have an impact on the reputation of cooperatives and the positioning of their commodity brand, which would contribute to an increase in the sustainable production of goods for these reasons. So far, farmers' cooperatives must still do business within the economic model significantly restraining this category of subjects in Serbia's agro-economy with respect to their receiving even short-term stimuli, which the government can regulate in a manner complying with the constitutional principle of the equality of all the property and entrepreneurship sectors, i.e. that "Everyone has an equal legal position in the market" – as it is defined by Article 94 of the Constitution of the Republic of Serbia (The Official Gazette of the Republic of Serbia, no. 83⁄2006).

4.4. Rightfulness

What is needed? Researches into a sustainable economy are clearly indicative of the fact that there is an imbalance of possibilities, powers, goods and welfare in the now

economy and that changes related to that are a necessity for the establishment of a rightful society.

What have we achieved? The directors of our farmers' cooperatives understand the need for a more rightful and sustainable economic model where all cooperative members can do business at a profit. Our research indicates that the majority of the surveyed are supportive of the United Nations' Universal Declaration of Human Rights, International Workers' Standards of the International Labor Organization, OECD's Directions for Multinational Companies and the principles of human rights arising from the UNGC. This provides a common framework for communication where they can act.

Conclusion: When "enterprises" belonging to the cooperative sector – which is the usual terminology for cooperatives in European countries and the world, international declarations provide each one of the "five capitals" with the basis for accession to rightfulness. In any case, they cannot fully be dislocated from the current economic model. New values, new ways of thinking and different directions in measuring economic growth are necessary, and declarations at the international level make a contribution to commencing that.

4.5. Responsibility

What is needed? The UNGC research indicates that 93% of company directors consider sustainability to be of an essential importance for their future success. That requires that prosperity and growth should be separated from each other as well as that their negative impacts on the society and the living environment should be alleviated (UNGC). Business circles see this as part of their own responsibility; however, they also know that doing business with awareness can be lucrative in the financial sense.

What have we achieved? The majority of our cooperatives have indicated the same significance in the cases of all the three pillars of sustainability. Their rules of behavior give priority to economic issues and social justice issues. The current economic crisis has shed light on the greediness and selfishness of business in non-cooperative sectors, pointing out a broad gap between what has been said and what has been done, especially in relation to social justice. This has generated a wide mistrust in the model of a liberal economy and an ever-increasing critical approach to production globalization processes and trade liberalization.

Conclusion: Humans, the planet and profits must be balanced with each other. Economic subjects understand that there is an urgent need for an efficient approach to the concept of the Triple Bottom Line. Now, when only growth is valued, the current economic model does not take into consideration the responsibility towards humans and the living environment. Apart from their dedication to the "ultimate product", business circles should defend a sustainable responsibility, especially among all those who are involved in the offer and demand network. This is currently a rare phenomenon in practice; however, it is a possible one.

4.6. Motivation

What is needed? One of the five fundamental conditions enabling us to put things where they should be, which directors believe in, is a regulated environment making clear clues and stimuli for including sustainability in strategies and operations possible (UNGC, 2010).

What is it we have achieved? Our research indicates that 60% of the directors of the farmers' cooperatives believe that the government should ensure a clearer support and clues leading to sustainability. They agree that there is a need to generate more rules, especially those leading to progress towards greater rightfulness and a sustainable financial environment. The directors of the cooperatives we have surveyed expressed different levels of wishes for partnership with the government in order to solve these questions, some of them requiring higher standards, on the one hand, and the others sticking to the now standards, and in that way find a solution to a competitive market for them.

Conclusion: Cooperatives value the existence of clear rules and stimuli in order to include sustainability in their performances. In any case, stimuli are still difficult to transfer towards a financial model based on capital and competition. Businesses' initiatives will remain unnoticed unless governments allow business circles to be autonomous in changing the market.

4.7. The outer side

What is needed? In the UNGC review, the analyst and investor community has essential significance, as directors assert. In any case, it is difficult for companies to make more significant progress towards the implementation of sustainability as an integral part of business doing if the assessment in the review does not take such efforts into consideration (UNGC, 2010).

What have we achieved? Our research indicates that 65% of the directors of the farmers' cooperatives "agree" and 25% of the directors "agree very much" that it is important that data about sustainability and finances be joined together and entered into a common report.

Conclusion: New forms of reporting are significant in the creation of an economic model inclusive of all possible influences on the performance of farmers' cooperatives as a form of social entrepreneurship in rural areas. This will also change the way in which investors and financial analysts calculate a return on invested money.

4.8. Purpose

What is needed? The UNGC review indicates that 78% of directors believe that companies should become engaged in industrial cooperation and partnerships of more shareholders in order to respond to development goals (UNGC).

What have we achieved? In compliance with development goals, the leading question for the surveyed cooperatives is the one referring to their contribution to a development partnership. To them, the majority of the world challenges regarding sustainability should

be solved through multi-participant partnerships. Within the framework of our research, 46% of the directors of the farmers' cooperatives "agree" and 43% of the directors "agree very much" that partnerships should be established with all participants in order to attain the goals of sustainable development. On the one hand, the directors of our cooperatives appear as good ones in establishing a partnership, as it is the case when everybody stated that they were cooperating with other organizations on small philanthropic projects within their respective cooperative acting as a socially responsible one in the local community.

Conclusion: Sustainability will only be achieved through a common vision of all participants in the society. The farmers' cooperatives are aware of the significance of a partnership with an aim to respond to the challenges of the creation of an economically more sustainable cooperative model of business doing. A lot of things are yet to be done in order to make widespread and long-term influences arisen from a common vision visible.

4.9. Values

What is needed? The research of the Dialogue for a sustainable economy indicates that the values supportive of the current economic system can be incompatible with sustainability. In any case, the UNGC (2010) review says that 81% of directors – compared with only 50% in the year 2007 – believe that the questions of sustainability are completely integrated in the strategies and their respective companies' activities.

What have we achieved? The majority of the directors of our cooperatives have stated that "a failure to recognize values for all users" (26%) and "a lack of an efficient communication infrastructure" (20%) represent the main obstacles in the implementation of an integrated and strategic approach to sustainability in farmers' cooperatives.

Conclusion: Sustainability cannot be the only one theme. Those farmers' cooperatives which stick to the principle of sustainability must include the principle in their respective strategies and activities in order to stimulate the development of an economic model of sustainability. The main challenge is to find new manners of business doing so as to maintain the values of sustainability until the economic model of cooperative business has been transformed in a sustainable type. An important segment is to always bear in mind the financial element of the "five capitals" – which is becoming ultimate goal, not a goal per se.

4.10. Measuring

What is needed? The UNGC study indicates that business circles are making progress, and that it is clear that directors are also the ones to be doing their best to establish a more efficient action on the part of the management in their business units by concretely measuring the emission of gas, water and and wastes – as well as non-tangible assets, such as shareholders' trust, reputation and efficient management.

What have we achieved? The surveyed directors of the farmers' cooperatives mainly agree that the Triple Bottom Line (TBL) of economic, natural and social business questions should be included in the strategy and performance of the management. In

the TBL triangle, the living environment tends to be the word which the most attention is paid to in sustainability. The preservation of the living environment is regulated by law, so it is formally legally secured; however, innovations in this field represent competitive advantage.

Conclusion: Sustainability indicators are of essential importance for the valuation of business activities and the creation of a valid sustainability index. Farmers' cooperatives should take the rural economy to new economic measurements valuating the other capitals as an addition to the financial one.

5. Final considerations

The economy of the future and our future are for the most part dependent on what we will do in the present. We have experienced the results of the economic model of unsustainability and we understand negative effects of this model on humankind in the long run very well.

All the data used in the writing of this paper have been cross-referred to each other in order to make them produce a clear picture of the role of business doing in the modeling of a sustainable economy; the type of organization anticipated as necessary for such an economy; and what it is we should do in practice with respect to business doing and the economy.

The conclusions drawn from the research we have conducted are clear. The majority of the directors of the farmers' cooperatives understand and appreciate sustainability as the main guideline for a future economy and its survival in the future. They mainly agree that certain activities are necessary to carry out so as to achieve sustainability; however, there is still a big gap between the consensus about the need for those activities and their implementation.

It is time all companies throughout the world went beyond the boundaries of the now model of business action. They should fully understand the process of sustainability and include the reduction of the influence, not only compensate for their social and natural influence on the processes of sustainability.

It is necessary that uniform and global rules of behavior inclusive of transparency, moral and the most honest of all approaches to communication with social players be created amongst different sectors. Implementing this in an efficient manner should improve the question of education. Leadership in sustainability will then be a factor creating trust and a perspective for a sustainable future.

The reduction of poverty is a broad and sophisticated theme to be transformed into an efficient activity; otherwise, it is no more than just a common statement of intention. Having in mind enormous differences among businesses, companies should dedicate their time and resources both jointly and within their respective industries to finding out a way how to contribute to the achievement of a fair economy.

Education is represented as the main question in the creation amongst the players, and is about to be of essential importance in ensuring equity and its promotion.

The mandatory accounting system with tax incentives and the public acknowledgement of the commodity brand can fully contribute to the ZERO impact program. For that reason, the employed should be trained and stimulated to be one of the two chief players, capable of influencing company decisions on sustainability.

At the national level, too, "Funds for the Planet" should be formed from the percentage of companies' earnings so as to solve social problems and those related to the protection of the living environment incurred by industries' activities. The consortium of the citizens' associations involved in this question should allocate where and how money should be invested.

A sustainable economy requires a new business model as well as a new organizational model in which awards and stimuli should stimulate "an attitude of sustainability", differently from the model with clear production awarding established during the industrial revolution. Sustainability should become part of the strategy of human resources management, where the valuation and appreciation of professional performance are in connection with the total approach based on and around the question of sustainability. Farmers' cooperatives and enterprises from within the agro-economy should form a "pro-sustainable network" amongst all economic subjects from within the same sector so as to create and share knowledge of sustainability. This collective database should help us find solutions and innovations that can bring investments to a maximum and shocks/risks to a minimum. In that manner, cooperatives will create their standard positioning, improve their results and protect their special form of business doing as the new paradigm of a sustainable economy.

The concept "the whole is bigger than the sum of its parts" is the one that farmers' cooperatives must keep in order to maximize their activities. That can be achieved through connecting cooperatives into associations of cooperatives and other modalities of cooperative systems. Simultaneously, it is important that we point out the fact that there is no competitiveness once unsustainability has come to surface because, then, an old cooperative rule that also counts is: one for all and all for one.

Risking finding oneself in a situation when we will not connect our personal and moral values with our professional obligations is the same as a compromise with good results of our business doing and our family's failure. The role of business doing in building a sustainable economy is in connection with our role as individuals. Business doing can and will have an influence on the future of the human race. That will depend on any one of us – our creating and applying necessary changes towards achieving a sustainable future.

Finally, farmers' cooperatives used to be, are and will continue to be in the future the generators of the economic, social, cultural and ecological sustainability of rural areas in AP Vojvodina, i.e. in the Republic of Serbia.

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ODRŽIVI RAZVOJ ZEMLJORADNIČKOG ZADRUGARSTVA U AP VOJVODINI

Miladin Ševarlić,[4] *Vuk Raičević,*[5] *Rade Glomazić*[6]

Rezime

Na osnovu sistematizacije relevantnih stavova koji danas dominiraju u pogledu održivosti na globalnom nivou, autori su koncipirali upitnik, sproveli anketu i u radu prikazali rezultate istraživanja stavova direktora zemljoradničkih zadruga o socio-ekonomskim, pravnim i ekološkim aspektima održivosti zadrugarstva kao „trećeg sektora" privrede i ruralnih područja u Autonomnoj pokrajini Vojvodini, sa osvrtom na pravni, ekonomski i ekološki ambijent poslovanja zadruga i drugih preduzeća u Republici Srbiji i posebno obaveze koje u pogledu održivosti proizilaze iz potrebe harmonizacije sa legislativom Evropske unije.

Direktori zemljoradničkih zadruga se veoma slažu (55%) ili slažu (45%) da održivost treba da bude implementirana u strategiju razvoja i poslovanje zadruga. Istovremeno, pored drugih relevantnih rezultata istraživanja, oni smatraju da će na budući održivi razvoj i poslovanje zadruga najznačajnije uticati obrazovanje (37%), siromaštvo (26%) i zdravlje (22%); a da će na odluke koje se tiču održivosti najveći uticaj imati vlade (21%), mediji (18%), zaposleni (14%) i radničke organizacije i udruženja (14%).

Ključne reči: *održivost, socijalno preduzetništvo, društvena odgovornost, zemljoradničko zadrugarstvo, Vojvodina.*

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CLUSTER DEVELOPMENT IN FUNCTION OF IMPROVING COMPETITIVENESS OF SMEs IN SERBIAN FOOD INDUSTRY

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Summary

Food industry is one of the branches that have the most potential in the Republic of Serbia. Small and medium companies (SMEs) in food industry can improve its competitive ability on the basis of clustering - entrepreneurs get what they had previously lacked: new knowledge, new technology, better access to credit lines, easier market performance, and completion of the production cycle, from primary producers to sell. Creating a cluster corresponds to primary producers who want to gain confidence in manufacturing and its placement. By combining the final clusters or provide the raw material whose quality can be affected.

Key words: *clusters, small and medium enterprises, competitiveness*

JEL: *Q13, D24*

Introduction

Competitiveness is, obviously, important. In a world with limited resources, one would like to see that these are used as efficiently and effectively as possible and thus leading to enhanced living standards for all today and in the future. While there is much agreement on the economic and social importance of competitiveness, it is less clear what exactly competitiveness is and what its most important determinants are. Clustering of firms can lead to spillover of knowledge, stimulating this entrepreneurial function to expand innovation. Within the context of spatial clusters, the effects of unstructured, perhaps unmanaged, knowledge spillovers typically have been confirmed and often assumed to be dependent on entrepreneurial function that exploits opportunities not taken up by

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particular solo enterprises. However, the productivity of collaborations in R&D has been increasingly recognized.[5]

Food production is a significant export potential of the Republic of Serbia, but it is not implemented enough due to the weak competition of the companies and products themselves.[6] There are various factors which obstruct domestic companies to become more competitive and one of them is inadequate government support reflecting the low financial support of the agricultural sector. Agribusiness is the most important industry in the Republic of Serbia, that in the creation of gross state product (GDP) accounts for about 17% as follows: agricultural production 10.6% and food processing industry 6.4%. However, in the overall contribution of agriculture to other sectors of the economy, particularly manufacturers and processors of raw materials and inputs, this share exceeds 40% of total GDP.[7] In 2010, the agrobusiness absorbed colese to 7.8% of all work forces in Serbia, while, for example, within the processing industry there were 17.2% employed people of the workforce.[8]

The Republic of Serbia is rich in natural resources, but the means to be invested into the irrigation, new technologies and etc., are necessary. In the table 1. there are data about certain agricultural products during the year 2010. and it can be seen that the raw materials are dominant. These data warn us of the necessary changes in business of the domestic agricultural which is particularly referred to the food manufacturing process. Namely, domestic producers mostly sell the products as raw materials that are later packed in some European countries and sold as at a much higher price. Therefore, one of the goals for the domestic companies has to be the selling of the technological processed agricultural products, as well as adopting the necessary standards in the food production. One of the most important sectors in forming the BDP in Serbia is the food processing industry. The greatest influence on forming the BDP is based on the manufacturing thru food products, drinks and tobacco with 31, 4%.[9]

Serbia has a margin of production capacity in most of the sectors. Abattoir sector, for example, works with 40% of the capacity, and there is a margin of capacity in the

5 Weaver, R.D. (2008): *Collaborative Pull Innovation: Origins and Adoption in the New Economy*, Agribusiness, 24(3), p. 388-402.

6 Mihailović, B., Cvijanović, D., Hamović, V. (2009): *Analiza investicione i izvozne aktivnosti poljoprivrede Srbije,* Ekonomika poljoprivrede, 56(1), p. 73-85.

7 Privredna komora Srbije (2011): *Privreda u Srbiji,* Beograd. Retrieved from http://www.pks.rs/PrivredaSrbije.aspx?id=13&p=2& [accessed february 2012.]

8 Statistical Office of The Republic of Serbia (2011): *Statistical Yearbook of The Republic of Serbia*. Belgrade. Retrieved from http://www.media.srbija.gov.rs/medsrp/dokumenti/SGS2011_cyr.pdf [accessed june 2012.]

9 Vlada Republike Srbije (2005): *Nacionalna strategija privrednog razvoja Republike Srbije od 2006. do 2012. godine*. Beograd, p. 8.

flour manufacture as well as in the milk production.[10] The greatest part of the unused processed capacities is inherited from the socialistic sector, and due to the outdated technological base it cannot be used. The low level of productivity is also a commonly expressed. The producers who do the best business do not gain the exploitation of the capacities of the 100%. The implementation of the EU standard in the process of the manufacture will only increase the problems with the productivity within the competitiveness of the domestic food manufacturers.[11]

Table 1. Exporting products in 2010[12]

Product	Quantity (in t)
Commercial maize	1.5 million
Commercial wheat	200,000-300,000
Refined sugar	180,000
Baby beef	8,700
Eatable oil	20,000-30,000
Raspberry	80,000
Sherry	25,000

Clusters as a development assumption of competitive ability of the small and medium companies

One of the significant connection forms of the small and medium companies is clusters. Cluster is a geographically determined concentration of similar or complementary businesses with active channels for business transactions, communication and cooperation. The basic goals of clusters activity are:

- Knowledge innovations and the application of the modern managing techniques;
- Determining business standards and forming a successful trade mark;
- Giving counseling services to entrepreneurs and potential entrepreneurs;
- Equipment approach and the approach to business offices;
- Organizing different events/gatherings i.e., seminars within the area of gaining entrepreneur skills;
- Connection to the state organs of the local management, regional and central level, with the function of the development of the private entrepreneurship and competitiveness;
- Connecting the entrepreneurships with the foreign partners, big companies,

10 Vlada Republike Srbije (2005): *Strategija razvoja poljoprivrede Srbije*. Službeni glasnk RS 78/2005. Beograd. Retrieved from http://www.kg-cci.co.rs/pdf/strategije.pdf [accessed february 2012.]

11 Pejanović, R., Cvijanović, D., Njegovan, Z., Tica, N., Živković, D. (2009): *Problemi poljoprivrede Republike Srbije i mere za prevazilaženje krize,* Ekonomika poljoprivrede, 56(2), p. 221-230.

12 Luković, Z. (04.06.2011): *Umesto milijarde, za poljoprivredu godišnje 280 miliona evra*. Novac, Ringier, Beograd.

international organizations, international donors, foundations that finance the development of the civil society (education, development of the specific knowledge, specialization and etc).

Regional clusters (merging) in the last 30 years of the last century have caused a great attention. They represent a concentration of the mutually dependent companies on one geographical area. They are restricted to geographical areas, and they have a great number of companies and employees within a small number of related industrial sectors. In the European countries and USA, regions are being formed whose economy is mostly based on the small and medium companies (Italy: Venice, Friuli–Venezia Giulia, Emilia Romana; Germany: Ruhr Area, Baden-Württemberg, and Freistaat Bayern; USA: California).[13] These regions have made faster progress from the average of the national economies. Regional clusters do not know the national boundaries and they can improve the development of the national economy and the entire regions.

The food and drink manufacturing industry is Europe's second largest manufacturing sector, as measured by value added, food processing is also a relatively fragmented industry with comparatively many small and medium-sized companies, as compared to the U.S. food processing industry and most other EU manufacturing sectors. In the European single market, it may be expected that in the medium run, inter alia, through concentration and the formation of pan-European enterprises a shift of competitiveness will take place and thus leading to strongly performing and product-specific manufacturing and processing industries across the EU territory. This process may have started already. For instance, cross-national merger activities in the EU food and drink manufacturing industry (including tobacco) manufacturing industries have increased strongly during the last decade, according to EU Commission data.[14] In some countries of the European Union (EU) the development of the regional clusters is a new kind of industrial policy, while in others such as Portugal, Denmark and Great Britain there is an initiative for creating the set of clusters and forming the cluster policy. There are two types of clusters:

- The support to the increase of the present or the one to be developed into regional cluster;
- Sharing the knowledge of the industrial development process in the regional clusters, particularly in relation to the information relevant to the general policy spread.

13 For example, accorging to Menrad (Menrad, K. (2004): *Innovations in the food industry in Germany*. Research Policy, 33(6), 845-878.) , the food industry in Germany is characterised by a strong focus on the German market. At first glance, specific regional clusters do not exist in the food industry in Germany. The food industry in Germany fulfils the principle requirements of the NSI approach (which can be described with its four basic concepts: innovation, learning, system and nation). In addition, particularly the knowledge generation system and the co-operation pattern of the food industry in Germany are mainly nationally-oriented.

14 Fischer, C., Schornberg, S. (2007): *Assessing the Competitiveness Situation of EU Food and Drink Manufacturing Industries: An Index-Based Approach*. Agribusiness, 23(4), p. 473-495.

Essentially, the policy of clusters is a simulative link of the local business environment through public-private dialogue, which is defined by common research needs, co-development between contractors and suppliers.

Analysis of cluster organization in different countries of the world looks at different ways of joining the Association of Entrepreneurs. A significant number of clusters in the world have began their own work only on the basis of a simple agreement to work together and exploring opportunities for collaboration between members of the cluster during the first year of existence. Namely, at the very beginning of the clusters are much more significant agreements on joint action and cooperation member companies, rather than defining specific structures for the provision of financial resources. With the development of market economy and the spread of performance in foreign markets, and the clusters are transformed to the direction of establishing a professional association or forming consortia. Experiences show that there are different ways to form clusters:

1. Contract, i.e., an agreement of the mutual actions of the company that form clusters;
2. Establishing the economy associations, i.e., an association of the entrepreneurs of a certain area;
3. Forming consortia.

The first type of organization of the cluster was the agreement. We have already noted that this form of establishing a good clusters only for the initial operation, no longer than one year. After the expiration of one year, it is necessary to transform the cluster into a more formal organization. The agreements are good because they are binding only in meeting the common objectives, but do not carry the long-term character development. Another way is to cluster formation of economic associations - Association branch, founded by the owners of the companies that make up the cluster. It is an association that has the characteristics of the chamber type. The cluster of this type is the higher degree of formal organization in relation to the former and its authority in the field of information, training and promotional activities, as well as appearances at international markets. Funding for the creation of information, training and promotional activities are provided mainly from its own resources, based on fees paid by companies. The problem with this type of cluster organization is the voluntaristic approach; the long term can affect the inadequate development of the cluster. Leaders in the cluster are satisfied with the effect of providing a form of economic associations, primarily to promote their own goals, while smaller cluster members can be marginalized over time.

The literature says little about the wider role of networks and clusters in innovation, of differences between large and small companies, of the effect of alternative distribution channels, or the impact of internationalization.[15] The most complex form of cluster organization is the establishment of joint stock companies where the founders of companies who constitute the cluster and which are limited liability companies. The best way of connecting companies for this purpose is the formation of the consortium. The

15 Traill, B.W., Meulenberg, M. (2002): *Innovation in the Food Industry*. Agribusiness, 18(1), p. 1-21.

Consortium is an unnamed contract that is a product of business practices. Consortium Agreement creates multiple groups of companies, which retain their legal and business personality, which is centered on a business goal. The consortium has assembly and board of directors. The consortium is engaged realizing common tasks, such as the formation of brand, quality management system, development of integrated management systems, innovation activities, research and development, improving the productivity of knowledge, thus with all those jobs and functions that individual SMEs as founders of clusters can deal with. This form of cluster organization aims to continuously provide the financial resources for developing, launching their own funds, applying for a business, profit sharing, etc.

Regardless of the organizational form chosen for the start of the cluster, it is necessary to understand that it will change over time, as the market becomes more successful cluster. The point is - form should follow function of clusters and to foster the development goals of the cluster.

The role of clusters in the improvement process of the competitive abilities of small and medium companies in the Republic of Serbia

The sector of small and medium companies has an important role in the development of the domestic economy. Most of the companies operating in the Serbian market according to official indicators, defined as small and medium enterprises (SMEs). In Serbia, SMEs participate in the total number of enterprises with 99.8% from 65.5% in employment, with 67.6% of the market, with about 36% of the gross domestic product. The total exports of the SMEs sector accounts for 50.2%, in imports of 64% and 51.2% in investments in non-financial sector. Micro enterprises are dominant in the SME sector with a share of 95.6% total and employ almost 50% of the total number of employees.[16]

SMEs development significantly affects the improvement of competitiveness of national economy. SME is acting flexibly develop innovative market, and in some cases made revolutionizing the existing parts of the market. The most important role of the SME sector should be reflected in the development of competitiveness at the level of national economies into the international business functions to improve the local economy. Serbian Government adopted the Strategy of development of competitiveness and innovativeness of SMEs for the period 2008-2013. The above strategies should contribute to further strengthening and effective use of development potential of the SME sector, which will have a positive effect on economic growth in the Republic of Serbia. Such guidance should contribute to increasing competitiveness and exports, further strengthening the innovation capacity of enterprises, employment and the dynamic development of more balanced regional development. On the other hand, a significant part of domestic firms is not ready to enter the international market and the free market competition with international competition. Uncompetitive

16 Službeni glasnik RS (2008). *Strategija razvoja konkurentnosti i inovativnosti MSP za period 2008-2013. godine*. Br.55/05, 71/05-ispravka, 101/07 i 65/08, Beograd.

products can be found in the fact that Serbia is not yet sufficiently developed free market competition. Some features from the past are still occurring as obstacle to development of international business with local businessmen, among them the most important are:

- Insufficient orientation of the production forwards the export;
- Unsynchronized performance of local businessmen;
- Lack of implementation of modern principles of corporate governance, adopting the marketing concept and its application in international business[17] and the like.

Raising the competitiveness of domestic enterprises is possible with the following requirements:

- Privatization;
- Development of small and medium companies (SMEs);
- Continuously update skills of entrepreneurs;
- Introducing new technologies;
- Attracting foreign direct investment.

Improving competitiveness of SMEs implies active use of knowledge, improving the productivity of knowledge and application of modern management techniques. To the small and medium companies failed to achieve adequate performance on the international market, it is necessary to accept the experience of developed countries, which suggests that the association of the most important factor in the internationalization of small and medium companies.

What small and medium enterprises, especially those that are defined as micro enterprises, resources are so special. These companies operate with very limited business resources. So, as a basic feature that management can make to SMEs is the lack of specific resources. The final outcome of this implies that the formation of alliances or alliances need and market reality. In support of the association of SMEs and business associations, clusters as a function of performing successfully in the international market, say the following advantages:

- Association of SMEs in business alliances to achieve synergetic effect of their appearance on the international market;
- Overcomes the problem of poverty of resource;
- Dramatically reduce the cost of servicing the international market, and therefore the business;
- Create the conditions for widespread application of modern management techniques;
- The pace of internationalization of business is significantly faster, with the possibility of further conquest of foreign markets.

The strategy of development of competitiveness and innovativeness of SMEs for the period 2008-2013 was positioned with clusters as an instrument to increase competitiveness in

17 Cvijanović, D., Popović, V., (2002): *Marketinška orijentacija preduzeća uslov razvoja malih i srednjih preduzeća u agrobiznisu Srbije*. Ekonomika poljoprivrede, 49(3-4), p. 129-135.

international markets.[18] According to data from 2008 in Serbia there was 22 clusters, of which in 2008, age 14 clusters received support from the government - Ministry of Economy and Regional Development has provided 52 million dinars of grants for the establishment and development of clusters (31 million are budget resources, and 21 million was a Norwegian donation).[19] According to currently available data[20] in Serbia exists 27 clusters. Of these three clusters are in the establishment - textile cluster LZOTEKS, RE: Crafts - cluster for the revitalization of traditional crafts in Serbia, and cluster Somborski salaši. Clusters are established as a civic association. Of the 27 clusters we have in the second phase of the establishment 12, six of them national - Automotive Cluster of Serbia - AC Serbia, Galena - Cluster for the organized collection and recycling of waste batteries and accumulators, Medical Tourism Cluster, The Agency for Wood - Serbian Wood Processing Cluster, Serbian Film Association – SFA, ICT Network and Auto REC Serbia – Cluster for management of waste vehicles. We also can mention some clusters from the first phase of development - Fashion and Clothing Industry Cluster of Serbia - FACTS, Cluster of Serbian food producers - POLUKS, Vojvodina ICT Cluster, Construction Cluster-Brick, and Agribusiness, etc.

Organizing SMEs is certainly a question of entrepreneurial initiative - entrepreneurs have to find yourself interested in joining, but should not in pursuit of their interests are dissimulated. With the Strategy of development of competitiveness and innovativeness of SMEs the state government has created an institutional framework that will allow uninterrupted association of entrepreneurs, but the question of organization of entrepreneurs is their only issue, however. Entrepreneurs on the basis of private initiatives should be organized as a function of successful market penetration, particularly at the international level. The question of organization of entrepreneurs in the domestic market is under-represented, regardless of the specific improvements that were achieved in the last three years.

Clusters as a form of improving the competitiveness of Serbian companies in the field of agricultural and food industry

Of the total number of clusters formed in the Republic of Serbia, the four clusters are related to agriculture and food industry and they are: BIPO Cluster - Balkan-Black Sea Industry of Agricultural Machine, Sumadijski flower - a cluster of flowers manufacturers, Agribusiness and food producers Cluster - Pollux. The first two clusters are located in the second phase of development from the work of the cluster in the initial period of organized labor, while the other two in the first phase and includes the initial initiative to link the concept of clusters.

18 Vlada Republike Srbije (2008). *Strategija razvoja konkurentnosti i inovativnosti MSP za period 2008-2013. godine*. Službeni glasnik RS, br.55/05, 71/05-ispravka, 101/07 i 65/08, Beograd.

19 Ringier (04.10.2008): *Klasterima u lov na tržišta*. Novac, Beograd, p. 11.

20 www.klasteri.merr.gov.rs [accessed February 2012.]

Table 2, shows the basic data on all four clusters confirm the validity of their formation. Cluster Sumadijski flower has most affiliated companies (134), as well as scientific research and supporting institutions (10) to promote the work of the cluster. For them going BIP cluster with 30 companies and 9 scientific research and supporting institutions. Other clusters are smaller, but this is primarily what they are in the first stage when it is connected to and looking for new interested parties. Scientific research and supporting institutions are effective because they allow cluster members individually what had adequately addressed, and that is: new knowledge, marketing and product design, assistance in the implementation of standards, information on new trends in the sphere of their operations and the like. What is the all-important cluster, but also for the communities in which they work is that they employ many workers, which justify their association.

Table 2. An overview of clusters related to the food industry[21]

	Cluster BIP	**Šumadijski cvet**	**Agro industry**	**Cluster POLUKS**
The number of companies within a cluster:	30	134	18	20
The number of scientific-research supportive institutions:	9	10	3	7
The number of employees:	1.722	780	209	1.099
The overall profit of the companies within a cluster	€32 million	€3.7 million	€3.3 million	€33.3 million

Companies associated in clusters find that it is the biggest problem so far was the lack of trust between the companies and that this constituted an aggravating factor in the merger of trying. So joining the company in a cluster failed to achieve what until now was impossible, and that is freedom in the work of the company. However, the general problem of Serbian clusters is their lack of competitiveness, which hinders their business internationalization. Some clusters have begun to work in terms of improving competitiveness through various activities. Sumadijski flower cluster is aware of past successes and plans to expand the cluster through the association of new companies, not only from Serbia but in the region (Montenegro, Macedonia, Serbian Republic, Bosnia, and Croatia). So this cluster plans to hold the position of the largest organization of florists in the region. Their plans, particularly in favor of the signing of the CEFTA agreement, provide an excellent opportunity for Serbian food industry.

21 www.klasteri.merr.gov.rs

Domestic food producers, who have a quality product, have a problem with the placement of products on the market because here are not certain international quality standards.[22] In fact, manufacturers must take into account the quality of the product because the price for Chinese enterprises cannot be competitive. Therefore, implementation of group standards (HACCP, GLOBALGAP) clustering is an effective way for companies to be qualified to do business in foreign markets.[23] As an independent company it could not submit the financial costs of its introduction. Within the clusters there is Pollux initiative to introduce HACCP food safety systems which are the obligation of all companies in the food industry. This is one of the advantages of clusters in relation to its own business, because it allows for timely information in areas that are necessary for their business. According to the National Strategy for Economic Development of Serbia[24], as one of the most important measures for improving sector competitiveness in the food industry says the introduction of food safety standards, which should ensure the complete safety of food products in all segments of production and processing.

Companies from the food industry who have certificates of quality to them that believe in doing business with EU countries are not enough.[25] Specifically, they argue that to succeed in foreign markets other than the certificate required joint action associated companies as a whole. This just shows what the justification of the Serbian government in stimulating the merger of the clusters is.

Conclusions

One of the problems of the food industry is it's still not enough competition in foreign markets.[26] There are several reasons for this, but most important are: disorganized appearance on foreign markets, lack of funding performance in foreign markets, the continued product quality, lack of certain certificates (HACCP, GLOBALGAP, Halal certification, etc). Therefore, as the need arises for companies joining the cluster as a great way to overcome these problems. This applies particularly to SMEs that are not in the organizational and financial situation to respond to the need to develop competitiveness

22 Đorđević, D., Ćoćkalo, D., Bešić, C., Sajfert, Z. (2010): *Benefits From Implemented Quality Management System – The Research in Serbian Economy*. TTEM – Technics Technologies Education Management, 5(1), p. 189-197.

23 Djordjevic, D., Cockalo, D., Bogetic, S. (2010): *An analysis of the HACCP system implementation-The factor of improving competitiveness in Serbian companies*. African Journal of Agricultural Research, 6(3), p. 515-520.

24 Vlada Republike Srbije (2005): *Nacionalna strategija privrednog razvoja Republike Srbije od 2006. do 2012. godine*. Beograd, p. 47.

25 Đorđević, D., Ćoćkalo, D., Bešić, C., Sajfert, Z. (2010): *Benefits From Implemented Quality Management System – The Research in Serbian Economy*. TTEM – Technics Technologies Education Management, 5(1), 189-197.

26 Pejanović, R., Cvijanović, D., Njegovan, Z., Tica, N., Živković, D. (2009): *Problemi poljoprivrede Republike Srbije i mere za prevazilaženje krize,* Ekonomika poljoprivrede, 56(2), 221-230.

in domestic and foreign markets. In current practice, joining the company in clusters that operate in this area proved to be very successful, which resulted in that some clusters become leaders in the region.

However, to encourage the formation of clusters required the cooperation of several actors in society, such as state, local governments, business associations, etc. Their role is to promote the concept of clusters as well as the initiation of its formation. Special attention should be paid to scientific research and supporting institutions that represent the most important part of the cluster members for providing the necessary knowledge and information that are up to that time were less available.

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18. www.klasteri.merr.gov.rs [accessed February 2012.]

RAZVOJ KLASTERA U FUNKCIJI UNAPREĐENJA KONKURENTNOSTI MALIH I SREDNJIH PREDUZEĆA U PREHRAMBENOJ INDUSTRIJI SRBIJE

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Rezime

Prehrambena industrija predstavlja jednu od grana koja ima najviše potencijala u Republici Srbiji. Mala i srednja preduzeća (MSP) u prehrambenoj industriji mogu da unaprede svoju konkurentsku sposobnost po osnovu stvaranja klastera - preduzetnici dobijaju ono što im je do tada nedostajalo: nova znanja, nove tehnologije, povoljniji pristup kreditnim linijama, lakši tržišni nastup, kao i zaokruživanje proizvodnog ciklusa od primarnog proizvođača do prodaje. Kreiranje klastera odgovara primarnim proizvođačima koji na taj način dobijaju sigurnost u proizvodnji proizvoda i njegovom plasmanu. Udruživanjem u klastere finalni proizvođači obezbeđuju sirovine na čiji kvalitet mogu da utiču.

Ključne reči: *klasteri, mala i srednja preduzeća, konkurentnost*

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Review Article

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OWNERSHIP CHANGES ON ARABLE LAND IN THE REPUBLIC OF SERBIA IN HISTORICAL PERSPECTIVE[1][2]

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Summary

The subject matter of this paper is empirical investigation of the decisions of public policy making on the issue of arable land ownership during the two centuries of Serbian agricultural development. The goal of this investigation was to shed new light on the causes of long term economic backwardness of The Republic of Serbia. Following relevant historical facts that are incorporated in this work, we found constant and common factor to all historical phases of the development of land property rights. Our hypothesis was that frequent and insufficiently transparent changes of land property relations have always negatively affected economic activity because they left no time for strengthening the legal security of property owners. The result of our study is that the problem of ambiguity definition of land property rights in Serbian legislation has created room for inconsistencies in the implementation of agrarian reforms after the First and the Second World War. Special attention is paid to current changes in land ownership that take place within the process of denationalization and restitution of property seized after World War II, which are very slow and also inconsistent themselves. .

Key words: *agrarian reform, denationalization, restitution, ownership transformation, Serbia*

JEL: *P26, Q15*

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Introduction

Contemporary macroeconomic and economic history research respects the opinion of New Institutional Economics (NIE) that the pace of economic growth does not only depend on the effectiveness of use of scarce economic resources but also on the appropriateness and level of development of social and legal rules and norms that underlie the economic activity.[6] This is especially true for the societies in political and economic transition because of possible conflicting interests between the representatives of old and new social and institutional arrangements. Taking into account that the transparency of ownership relations is of fundamental importance for the stability of economic system, the NIE pays special attention to the changes in property rights in he societies in transition [7]

To understand better why The Republic of Serbia has been persistently among least developed European countries in previous two centuries we apply the NIE methodological principles of analysis of relevant historical facts considering frequent changes of land ownership relations. This is the first research on this topic and its goal is to shed new light on the causes of long term economic backwardness of The Republic of Serbia.

One of significant features of economic system of The Republic of Serbia, since liberation from feudal ties of Ottoman Empire at the beginning of the 19th Century until today, has been its frequent changes. Those changes had always affected fundamentally land ownership relations, creating continuously property-legal uncertainty, thus hindering agricultural development. Due to frequent changes of economic system, it has become common that policy makers determine who should be new land owners at times when legal property relations established by previous systemic solutions had not been yet completely defined. That is the reason why many property-legal issues, raised during agrarian reforms that had been undertaken after the First and the Second World War as well as within current changes of political and economic system have remained open until today.

When economic transition has started in The Republic of Serbia in 1990, towards reconstruction of private capitalist ownership relations, the issue of restitution of arable land, ceased by means of restrictive measures of the State in the interwar period had also been raised. General denationalization has been postponed for more than 20 years. In the meantime, certain categories of former land owners were compensated at least partly, through the process of partial restitution. Only when the *Law on Restitution and Compensation* was adopted on September 28th, 2011, formal legal conditions for general denationalization of agricultural land were met in Serbia. [8] This Low does not go in past further than 1945; so many property-legal issues of unfinished interwar agrarian reform still remain unsolved.

6 Ostrom, E. (2005): *Doing Institutional Analysis: Digging Deeper than Markets and Hierarchies*, in C. Ménard, M. Shirley, eds. *Handbook of New Institutional Economics*, (978-3-540-77660-4) Springer, New York, pp. 819-848.

7 North, D. C. (2005): *Understanding the Process of Economic Change,* (978-0-691-11805-5), Princeton University Press, Princeton, p. 36.

8 *Zakon o vraćanju oduzete imovine i obeštećenju*, Službeni glasnik R.S., br. 72/2011 (*Low on Restitution and Compensation*, Official Gazette of the Republic of Serbia, no. 72/2011).

Ambiguities in defining land property relations in the interwar period

Various inherited land property relations and tardiness in ownership transformation had burdened the economy of The Kingdom of Serbs, Croats and Slovenes, later The Kingdom of Yugoslavia during overall interwar period. Basic principle of agrarian reform undertaken immediately after the creation of Yugoslav State in 1918 was that "owner could have as much land as he could process". Despite this principle, numerous large estates from Austro-Hungarian period had survived in northern parts of enlarged Kingdom,, while at the same time inherited feudal land tenant relations had been changed only moderately in southern regions. Having in mind that Kosovo and Metohija, as part of so called Southern Regions became part of Serbia after Balkan Wars (1912-1913) and Vojvodina, as part of so called Northern Regions was annexed to Serbia after the Great War in 1918, agrarian reform was going to affect drastically the agriculture of Serbia.

The aim of agrarian reform after the First World War was to create small private estates, in the tradition of land property relations that existed before the Great War in The Kingdom of Serbia and had been established at times of Prince Miloš Obrenović back in the 19th Century. General pronciples for pursuing the agrarian reform in The Kingdom of SCS were written in February 1919, in *Previous Provisions for the Preparation of Agrarian Reform.*[9] Since during the implementation of agrarian reform these principles had been gradually abandoned, many formally recognized agrarian interested persons were deprived from land.

First, large estates in northern regions were classified according to the right for financial compensation of the owners. This right was meant for all owners of expropriated estates except members of Hapsburg Dynasty, members of dynasties of enemy states and foreigners who were granted the land by Hapsburgs. By *Previous Provisions* it had been decided to allocate expropriated land to farmers who had not enough of it or had no land at all, primarily to invalids, war orphans, volunteers and soldiers who participated in World War I. All larger forest estates had become state property and farmers were granted legal right to trespass, firewood and timber.

In practice, provisory conditions prevailed that had negative impact on agricultural development. [10] By adopting *Regulation on issuing large land holdings under a four-year lease,* general principles of agrarian reform, considering limitations of land maximum, were thwarted particularly in Northern Regions. While the peasants as temporary tenants were further deprived of legal security, since they did not have legal right to become land owners, landlords bargained with the authorities regarding determination of land maximum that could stay permanently in their possession. When *The Law on liquidation of agrarian reform on large estates* was adopted in 1931, it turned out landlords in Vojvodina kept

9 Lekić, B. (2002): *Agrarna reforma i kolonizacija u Jugoslaviji 1918–1941* (86-355-0526-3), Udruženje ratnih doborvoljaca 1912–1918, njihovih potomaka i poštovalaca, Beograd, Javno preduzeće Službeni list SRJ, Beograd, p. 223.

10 Vučo, N. (1958): *Poljoprivreda Jugoslavije 1918–1941,* Rad, Beograd, p. 24.

half of their property of the land that was previously meant for expropriation.[11] Under their pressure, the State authorities had given up narrower and broader land maximum determined at the first place, in line with economic conditions of certain regions, as it had been defined in *Previous Provisions.* Namely, only after *Law on Prohibition of alienation and encumbrance of large land holdings* was adopted on May 22, 1922, land maximum could cover 50 to 500 hectares, depending on the region in question. Then, such defined land maximum had been further relaxed by *The Law on liquidation of agrarian reform on large estates* from June 19th, 1931. At that occasion, it was stipulated that landlord could hold "super maximum for sustaining agricultural production so the estate could stay in size large enough to serve the best to economic development in general."[12]

Second, the colonization process on Kosovo and Metohija had started already in 1913, after Balkan Wars, based on *Regulation on the settlement in the newly liberated areas and annexed to the Kingdom of Serbia.* With the outbreak of World War II, this process was interrupted. After the war, colonization continued but the conditions for obtaining title to inhabited land would be defined only with *Law on settling Southern Regions,* adopted on June 11th, 1931.[13] Also, the abolition of feudal land ownership relations will be formalized only by the *Low on the organization of agrarian relations in former provinces of South Serbia and Montenegro,* adopted on December 5th, 1931[14] Based on these laws, settlers could obtain legal title to land 10 years after the land had been allocated to them. Thus, at the outbreak of World War II, speaking in the sense of property law, agrarian relations in Kosovo and Metohija remained to be completely undefined.[15]

The issue of compensating former owners had been arranged also as late as in 1931 so that all new owners, except volunteers, had themselves to pay compensation to former owners. In that way, temporary lease in Vojvodina had turned to obligation to compensation payments being heavy financial burden to new owners. In order to facilitate compensation payments, the State issued government bonds worth 800 million Dinars, in the name of *Loan for liquidation of agrarian reform in Northern Regions.* At the same time, *Loan for*

11 Gaćeša, N. (1984): *Agrarna reforma i kolonizacija u Jugoslaviji 1945–1948,* Matica srpska, Novi Sad, p. 85.

12 Ljubojević, R. (2011): *Odnosi svojine na zemlji u Jugoslaviji u vreme diktature kralja Aleksandra*, Megatrend revija, Megatrend univerzitet, Vol. 8 (no. 2), pp. 355-378, Beograd.

13 Službene novine KJ, br. 134/1931, 285/1931, 141/1933 (Official Gazette of the Kingdom of Yugoslavia, no. 134/1931, 285/1931, 141/1933).

14 On the basis of this law, tenant relations dating from feudal times had been abolished and feudal estates had been expropriated *Low on the organization of agrarian relations in former provinces of South Serbia and Montenegro*, Official Gazette of the Kingdom of Yugoslavia, no. 285/1931, (*Zakon o uređenju agrarnih odnosa u ranijim pokrajinama južne Srbije i Crne Gore*, Službene novine KJ, br. 285/1931).

15 Jovanović, V. (2006): *Tokovi i ishod međuratne kolonizacije Makedonije, Kosova i Metohije*, Tokovi istorije. Institut za noviju istoriju, vol. 14 (no. 3), pp. 25-44, Beograd.

liquidation of agrarian reform in Southern Regions worth 300 million Dinars was issued.[16] The State paid compensation to owners of expropriated estates through Privileged Agrarian Bank, with 5% government bonds with 30 years repayment period.[17] With the outbreak of the Second World War, realization of compensation payments and disbursement of government bonds had been interrupted.

Restrictive measures of the State on agricultural land after the Second World War

After the Second World War, with the introduction of socialism and centrally planned economy, comprehensive restrictive measures of the State were introduced over private property on the overall territory of Yugoslavia. The land had been taken away from private persons and entities with the aim of creating the state agricultural land fund for allocating to peasants and establishing large state farms.[18]

Restrictive measures of the State, implemented after the Second World War on agricultural land had nullified to a large extent even those partial results of interwar agrarian reform. Small private farms on one hand and large state farms on the other had been created. Property rights of farmers were extremely derogated by compulsory purchase of agricultural products and restrictions in sales of farms. Principles of earlier agricultural reforms were abandoned except, to certain extent, for the principle dating from Prince Miloš Obrenović that "the land belongs to those who work on it."[19]

Unlike interwar agrarian reform that had lasted for years and had not been ended until 1941, restrictive measures of the State on agricultural land implemented after the Second World War were executed relatively quickly. From 1945 to 1950, radical changes in ownership relations occurred on agricultural land due to implementation of restrictive measures of

16 Gnjatović, D. (1991): *Stari državni dugovi – Prilog ekonomskoj i političkoj istoriji Srbije i Jugoslavije 1862–1941* (86-7149-010-6), Ekonomski institut – Jugoslovenski pregled, Beograd, pp. 133-135.

17 Kingdom of Yugoslavia signed bilateral agreements on compensation of foreign citizens whose property had been confiscated within agrarian reform. Such agreements were signed with Hungary, Czechoslovakia, and Romania in Paris in 1930 and with Italy in Neptune in 1930. Restitution Agency of the Republic of Serbia: *History of ownership relations in Serbia*, Beograd, 2011

18 Gnjatović, D. (2007). *Ekonomija Srbije – Privredni sistem, struktura i rast nacionalne ekonomije* (978-86-7747-266-5). Megatrend univerzitet, Beograd, pp. 155-157

19 Article 1 of *Law on agrarian reform and colonization* says *in extenso*: "In the aim of allocating the land to farmers who have no land or do not have enough land, agrarian reform and collonization will be executed on the overall territory of The Fedrative Peoples Republic of Yugoslavia based on the principle: The land belongs to those who work on it". Official Gazette of FPRY, no. 64/1945, 16/1946, 24/1946, 99/1946, 101/1947, 105/1948, 4/1951, 19/1951, 42-43/1951, 21/1956, 52/1957, 55/1957 and Official Gazette of SFRY, no. 10/1965 (*Zakon o agrarnoj reformi i kolonizaciji*, "Službeni list FNRJ", br. 64/1945, 16/1946, 24/1946, 99/1946, 101/1947, 105/1948, 4/1951, 19/1951,42-43/1951, 21/1956, 52/1957, 55/1957, "Službeni list SFRJ", br. 10/1965).

confiscation, agrarian reform and colonization. However, in the course of those changes many issues from interwar agrarian reform remained unsolved.

All property of German Reich and its citizens had been confiscated on the grounds of *Decision of Anti-Fascist Council of National Liberation of Yugoslavia (NKOJ) of November 21st, 1944, on transition to state property of enemy property and sequester (right to seizure) of property that occupying authorities forcibly alienated.* Yugoslavia was also authorized by international law to make decisions on property seizure from Hungary, Bulgaria, Italy and Austria. Decisions on liquidation of property of these countries were part of signed peace treaties. Based on these decisions, Yugoslavia had liquidated the property of Hungary, Italy and Austria. Also, the property has been confiscated from all war prisoners of former Yugoslav army who rejected to return to home country after German capitulation, so they were deprived of citizenship.[20]

Restrictive measures of general character on agricultural land had been implemented on the basis of Federal *Law on agrarian reform and colonization* of August 23, 1945. According to this law, the land has been taken away without any compensation from landlords and private institutions. Smaller farmers were deprived of "surplus" property without compensation as well if they held more than 25 hectares of arable land and 45 hectares of total land area; non agricultural producers lost all land above three hectares. As a result of those measures, the state agricultural land fund of 1,611,867 hectares had been created, of which 407,037 hectares were allocated to 263,000 poor families; 336,047 hectares to 67,000 colonized families; remaining 868,783 hectares served to create state agricultural sector.[21]

Agrarian reform implemented after the Second World War was also intended to solve definitely open legal property issues from unfinished interwar agrarian reform and pursue its financial liquidation. In that respect, the *Law on liquidation of agrarian reform executed until April 6th, 1941 on large estates in Autonomous Province of Vojvodina* was adopted in Serbia.[22] By that law, agrarian interested persons to whom the land has been allocated and had settled on it until April 6th, 1941 were considered as land owners if they were working on the land themselves. Those agrarian interested persons, who have not settled on the land until that date, lost the legal right to hold it.[23] Thus many volunteers from the 1912-1918 wars were deprived from land.

Intricate agrarian relations in Kosovo and Metohija were to be solved by the *Law on the revision of land allocation to colonists and agrarian interested persons in Peoples Republic of Macedonia and Autonomous Kosovo and Metohija Region* of August 3rd, 1945. All feudal tenant relations had been abolished and previous tenants were proclaimed land owners by

20 *Confiscation of enemy propety*, Decision of NKOJ of November 21, 1944, Official Gazette of FPRY, no. 2/1945, 39/1945, 63/1946, 74/1946 (*Konfiskacija neprijateljske imovine*, "Službeni list FNRJ", br. 2/1945, 39/1945, 63/1946, 74/1946)

21 *Ekonomska enciklopedija* (1984), Part Two, Savremena administracija, Beograd, p. 154.

22 Službeni glasnik NRS, br. 9/1947 (Official Gazette of the Peoples Republic of Serbia, no. 9/1947)

23 Restitution Agency of the Republic of Serbia, ibid

Article 3 of this law. Also, those lessors who lived only from agriculture, having no other occupation or they could not live from other occupation, were also proclaimed land owners. In was stipulated by the same law that those colonists who got the land on the territory of Kosovo and Metohija before April 6th, 1941, lost their right to property that had been given to them within the agrarian reform if they could not meat special conditions determined by new authorities.[24] Also, many interwar colonists lost the right for title to land although the land was not taken away from them on the grounds of the above mentioned legal revision. They lost this right later, when the *Law on the treatment of abandoned land of colonists in the Autonomous Kosovo and Metohija Region* has been adopted in 1947.[25] According to this law, colonists lost the title to property if they did not return to live and work on their land until September 30, 1947. However, their return has already been prohibited in prescribed time limit because the *Decision of NKOJ on temporary ban of return of colonists to their previous residences* was then still in force.[26] According to this decision, colonists lost their land if they did not return to their farms until March 6th, 1945. Namely, during the Second World War the majority of settlers, mostly Serbs, had to leave their colonist land. The controversial temporary ban on their return to their farms had in the long run prevented them from exercising their property rights

When the system of self-management has been introduced in 1952, and the fund of state property has been renamed to the fund of social property, new restrictions were made on the disposition of privately owned farms. The *Low on farmland in social property and land allocation to agricultural organizations* of March 27, 1953 determined new land maximum of 10 hectares.[27] Agricultural producers were deprived of "all surplus of arable land above 10 hectares" and that land was transformed to social property. If agricultural households had many members or their farms were of worse quality they could keep 15 hectares in their possession. By the implementation of this law, another 275,900 hectares of arable land had been taken away from 66,459 households and became part of the fund of social property.[28] The State awarded the right to permanent use of the seized land to agricultural organizations in social property.

24 Those special conditions assumed that agrarian interested persons would lose their land if a) private property of arable land was granted to them that was taken away from someone who needed that land back to work on it; b) they settled after 1918 on the land of Albanians who were political emigrants, c) they were not farmers but got the land as police officers, financial clerks for services made to anti-populist regimes d) they gave the land that was granted to them under lease."

25 Official Gazette of the Peoples Republic of Serbia, no. 9/1947; this law was in force until December 20th, 1990.

26 "Službeni list DFJ", br. 13/1945 (Official Gazette of DFY, no. 13/1945).

27 "Službeni list FNRJ", br. 22/1953, 10/1965 (Official Gazette of FPRY 22/1953, 10/1965)

28 *Ekonomska enciklopedija*, p. 155.

Current flows and further directions of the restitution of agricultural land in the Republic of Serbia

Serbia was among last countries that emerged in the region of former Yugoslavia which pursued to the adoption of the law on general denationalization and restitution of private property.[29] Corresponding laws were adopted in Slovenia in 1991, Croatia in 1996, Macedonia in 1998, Republic of Srpska in 2000 and Montenegro in 2004. With the adoption of *Low on Restitution and Compensation* of September 28, 2011 legal grounds for general restitution of private property, seized by communist authorities after the Second World War, were finally established.

The process of partial restitution has started in The Republic of Serbia in 1991, with ownership changes on arable land, with the adoption of *Law on ways and conditions for recognition of rights and the return of land that has become the public property on the basis of the agricultural land fund.*[30] The object of restitution by this law has been "land surplus above 10 hectares" taken away from farmers on the grounds of the *Low on farmland in social property and land allocation to agricultural organizations* of March 27, 1953.

The process of partial restitution has continued in The Republic of Serbia in 2006, again on arable land, with the adoption of the *Law on restitution of property to churches and religious organizations.*[31] The legal right to restitution is given to all churches and religious organizations on the territory of Serbia that were deprived of their property after 1945, without any compensation by the State. It has to be pointed out that it is an extensive operation of property transformation because 819 estates with total area of 53.491 hectares were expropriated from churches and religious organizations in Serbia after the Second World War. [32] "Land surpluses" above 10 hectares were seized from shrines, monasteries, religious institutions and endowments of all kinds, secular and religious. Farms, gardens, vineyards, orchards, meadows and forests were taken away. Only religious institutions of greater historical value were left with up to 30 hectares of arable land and up to 30 hectares of forests. The decisions on how much land would be left to concrete religious institution were made by the minister for agricultural reform later the minister for agriculture.

In 2006, Serbian authorities claimed that the main reason to pursue to partial private property restitution by returning only the arable land instead to general denationalization of all seized private property has been the fact that it was easier to return the arable land

29 Zekić, S., Lovre, K., Gajić, M. (2009): *Transformacija poljoprovrede zemalja Zapadnog Balkana u periodu tranzicije,* Ekonomika poljoprivrede, Institut za ekonomiku poljoprivrede, vol. 56 (no. 2), pp. 187-200, Beograd.

30 Službeni glasnik RS, br. 18/1991, 20/1992, 42/1998 (Official Gazette of RS, no. 18/1991, 20/1992, 42/1998).

31 This law was adopted on May 25, 2006, was in force on June 10, 2006, and has been implemented since October 1st, 2006. Official Gazette of RS, no. 46/2006 ("Službeni glasnik Republike Srbije", br. 46/2006)

32 Gaćeša, N. (1984). *Agrarna reforma i kolonizacija u Jugoslaviji 1945–1948*. Matica srpska, Novi Sad, p. 362, 364.

in its natural shape than residential and commercial buildings, apartments and business premises. In most cases in question it has been dealt with arable land that had remained in social property fund regardless ownership transformation processes in Serbia. Thanks to that fact, it was easier to identify this kind of property than other nationalized property that changed frequently owners during ownership transition in the last 20 years. [33]

Basic principles of the restitution of arable land within future general private property restitution in Serbia, established by the *Law on Restitution and Compensation* are: equal legal treatment of former owners; disposition of their will to initiate the restitution request; protection of legal security of present owners, priority of natural restitution and residual financial compensation.

The principle of equal legal treatment of former owners, being the foundation of all legal norms on property restitution is an expression of the need to underline clearly democratic basis of this segment of property transformation. By complying with the principle of equal treatment, Serbia builds modern European legislation that does not allow any kind of discrimination of restitution beneficiaries.[34]

According to the *Law on Restitution and Compensation,* legal right to restitution of arable land is given to former owners and their legal successors, as well as endowments that have been deprived of their property or their legal successors. This law is also to be implemented on property confiscated from citizens of Serbia after March 9th, 1945, who had been proclaimed national enemies under the condition they are rehabilitated previously, in accordance with the *Low on Rehabilitation.*[35] Legal right to restitution has been denied to persons whose property was confiscated because they were part of occupational forces that acted on the territory of Serbia during the Second World War.

The principle of disposition of will of former owners to initiate the restitution request means that the restitution procedure does not start *ex officio* but exclusively at the request of interested title to the property. Former owners can submit the restitution request in two years period, beginning from March 1st, 2012. The competent authority, being newly created Directorate for Restitution has to conduct the procedure with no delay and to issue a decision on restitution in six months period from the date of legal request. Such hurry is understandable because it is delicate process of dispossession of ones and appointment of other owners. Namely, while such procedure lasts, the property under restitution claim is out of its economic function and, in legal sense it is in insufficiently protected status. So, there is every reason to pursue as

33 Todorović, V. (2008) *Restitucija imovine crkvama i verskim zajednicama u Republici Srbiji*, Pravni život, Udruženje pravnika Srbije, vol. 57 (no. 3-4), pp. 123-145, Beograd.

34 Laura, S. (2010): *Private property issues following the change in political regimes in former socialist or communist countries*, European Parliament, Policy Department Citizens' Rights and Constitutional Affairs, p. 8

35 *Zakon o rehabilitaciji*, "Službeni glasnik RS", br. 33, 2006; br. 92, 2011 (*Law on Rehabilitation*, Official Gazette, no. 33, 2006, 92, 2011)

quickly as possible to general restitution of seized private property in Serbia.[36] However, it is an open issue if newly created Agency for restitution has objective possibilities to reply on all requests of former owners in such a short notice.[37]

The principle of protection of legal security of present owners points to the need to respect the acquired rights. The law guarantees unchanged legal position to present owners of property that is under its jurisdiction. It means that present owners will not become liable parties in restitution process and former owners who cannot come into possession of their property will be compensated by the State.

The principles of priority of natural restitution and residual financial compensation assume that seized property should be returned primarily in its natural shape directly or indirectly with other corresponding property. If direct natural restitution or natural substitution is not possible financial compensation is to be paid under market terms. In this respect, the law provides that the State will issue bonds to compensate former owners. The question of defining the specific conditions under which these financial operations will be conducted remains open.

Conclusion

The process of actual ownership changes on agricultural land in The Republic of Serbia gained general character only in 2011 when the *Law on restitution and compensation has been adopted.* Adhering to the principles upon which this law is based will affect directly the establishment of new ownership relations. Moreover, the stability of the whole economic system will depend on the clarity in defining land property issues. Namely, the key determinant of economic system is the prevailing legal form of property. Observed in modern economic terms, the authority of the holder of title to the land is expressed through possession of natural resources, the appropriation of results of agricultural production and their market exchange. If property rights were returned accurately and quickly to former land owners, the legal security of property would prevail that is a prerequisite for market economy. Otherwise there is a real danger that in the process of restitution many ownership relations on agricultural land remain insufficiently defined as it was the case with interwar and postwar agrarian reform.

36 Stevanović, S,V., Đorović, M.T., Milanović, M.R. (2009): *Uzajamnost nivoa privredne razvijenosti i rezultata tranzicije,* Ekonomika poljoprivrede, Institut za ekonomiku poljoprivrede, vol. 56 (no. 4) pp. 551-563, Beograd

37 It has been estimated that 150,000 persons at least will file the restitution requests. Restitution Agency of the Republic of Serbia, http://www.restitucija.gov.rs/

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SVOJINSKE PROMENE NA POLJOPRIVREDNOM ZEMLJIŠTU U REPUBLICI SRBIJI U ISTORIJSKOJ PERSPEKTIVI

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Rezime

Predmet ovog rada je empirijska analiza odluka nosilaca javnih politika u oblasti svojinskih prava na zemlji tokom dva veka razvoja poljoprivrede Srbije. Cilj ove analize je bio da se baci novo svetlo na uzroke dugoročnog ekonomskog zaostajanja Republike Srbije. Bazirajući se na relevantnim istorijskim činjenicama koje su inkorporirane u ovaj rad, otkrili smo konstantan, zajednički imenitelj svih faza razvoja vlasničkih prava na zemlji.. Naša hipoteza je bila da česte promene svojinskih odnosa na zemlji deluju u dugom roku destabilizirajuće na privređivanje zato što ne ostavljaju vremena za jačanje imovinsko pravne sigurnosti vlasnika. Rezultat našeg istraživanja je otrkiće da je problem nejasnoća u definisanju svojinskih odnosa na zemlji stvarao prostor za nedoslednosti u sprovođenju agrarnih reformi posle Prvog i posle Drugog svetskog rata. Posebna pažnja je posvećena aktuelnim svojinskim promenama na zemlji koje se odigravaju u okviru procesa denacionalizacije i restitucije imovine oduzete posle Drugog svetskog rata, koje su veoma spore i same po sebi takođe nekonzistentne.

Ključne reči: *agrarna reforma, denacionalizacija, restitucija, svojinska transformacija, Srbija*

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SPECIFICITIES OF FRUIT FREEZE DRYING AND PRODUCT PRICES[1]

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Summary

Freeze drying, as relatively new process of drying in vacuum at very low temperatures, ensures the preservation of all thermo labile compounds in the initial raw material, and final low content of moisture provides microbiological stability and permanent preservation of products. Red raspberry, because of relatively high content of water (90%), specific structure of aggregate fruit, characteristic bright colour and flavour, was not preserved up to now by conventional drying.

This paper gives an overview on the two different methods of drying fruits: freeze drying and convective drying.

Raspberry sorts Willamette and Meeker were dried by freeze drying, as well as by conventional drying with warm air of low relative humidity. Freeze drying was performed in the device Christ Alpha I/5 under desublimers' temperature of -55°C and processing temperature of raw material of -35°C. Fruits of the sort Willamette were dried to a final moisture content of 18.86%, and Meeker up to 16.15%. Also, some changes in chemical composition, overall aroma, sensory characteristics, density and volume, water activity, loss of vitamin C, the degree of rehydration of the dried fruit in comparison to fresh one were tested. Gained results show that freeze drying can effectively preserve the chemical composition, volume, colour and aroma of raspberry.

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In the paper of authors from foreign countries the influence of different technologies for the products preservation was tested as freezing, freeze drying (or lyophilisation) and conventional drying. Tests were done with the main goal to determine the qualitative changes on strawberry, raspberry, gooseberry, elder, apricot, sour cherry, apple and cornelian cherry. All preservation technologies have reduced the amount of biologically active compounds, such as vitamin C and phenolic compounds. Related to the chemical composition of fresh fruit, decrease of tested parameters was affected by freezing for 15%, freeze drying for 28-32% and conventional drying for 45-48%.

The process of freeze drying is among one of the methods for preservation of raw materials of plant origin (fruits, vegetables, spices and herbs). Final product has a high nutritional value (as fresh fruits and vegetables). Freeze dried products do require special storage conditions (e.g. absence of light, packaging materials with low gas permeability, inert atmosphere, etc.). In this way dried products represent the basis for instant soups, bakery, dairy and confectionery products.

Key words: *fruit, raspberry, freeze drying, conventional drying, biologically active compounds, quality.*

JEL: *Q16, Q10*

Introduction

Freeze drying is a relatively new technology in the field of preservation of food products. Primarily it was developed for the pharmaceutical industry and drugs drying. For process of freeze drying raspberry first has to be frozen to a temperature usually lower than -30°C (*Janković et al., 2004*). Frozen raspberry is brought into the sublimation chamber where after closing and vacuuming is achieved extremely low pressure, below 10^{-1} bar. Under the influence of high vacuum, ice sublimates in frozen raspberry. Crystals of ice are transferred directly into vapour, thereby avoiding the appearance of liquid phase and migration of dissolved dry matter to the surface. In the pharmaceutical products the moisture content is decreased up to 1 to 5%, depending on the kind of products, while raspberry is dried to the moisture level of 10%. Dried raspberry is packed in gas impervious packaging, vacuum packaging or in package with high level of nitrogen. Freeze drying raspberry can be stored at room temperature in packaging that is light resistant up to 5 years.

In the researches of *Janković et al. (2004, 2006, 2010)*, whole fruits of raspberry sorts' *Willamette* and *Meeker* were freeze drying, with main goal to investigate all changes of volume, density, water activity, loss of vitamin C, the level of rehydration, as well as changes in chemical composition of freeze drying fruit.

Simplified, the freeze drying is a drying process where water is removed (drying of product) by sublimation of ice from previously frozen product (*Vračar et al., 2004*). As the product is dehydrated under vacuum in a frozen state, at temperatures below -30°C, and in the final stage of drying (separation of bound water) temperature under vacuum does not exceed 40°C, product practically preserves its structure and shape, chemical composition,

biologically-physiologically and sensory characteristics (colour, odour, taste). Process of freeze drying is practically done in three main phases:

- Freezing, or sub-cooling of product below its eutectic point (cca. -30°C and lower);
- Dehydration (drying) by ice sublimation under vacuum; and
- Completion of product drying up to moisture content lower than 3% by the normal vacuum drying.

Each of these phases, particularly sublimation, is important for the quality of freeze dried product. Those products are characterized by high porosity and therefore by great surface activity, that results easy absorption of moisture and oxygen. According to many undesirable quality changes caused by adsorption, de-vacuuming of chamber after completion of lyophilisation is performed with an inert gas (nitrogen) and quick packaging into the material that is gas, moisture and light resistant. Freeze dried product could be kept in a nitrogen atmosphere almost indefinitely. Compared to other drying processes, freeze drying has many advantages.

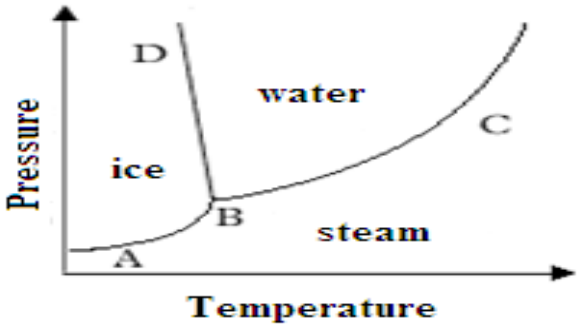
It is well known that fruits and vegetables have many benefits for life and health (*Sipos et al., 2009*). Beside their different and balanced mineral components, there are several organic compounds that are proven from medical aspect. One of the most important effects is their fibber content, which is related to the prevention of coronary arteriosclerosis and other diseases. Nutrients and vitamins dissolve in a product with high moisture content, so they can be easily and effectively used by the human organism. Just through recent decades scientific researches have focused on biologically active compounds, such as microelements and phenolic compounds, that all have antioxidant characteristics too. Although the high content of biologically active compounds was found in tropical and subtropical fruits, traditionally continental fruit also contains significant amounts of these compounds. One of the most important issues in food production is to preserve these valuable compounds. Unfortunately, vitamins, antioxidants, flavour, aroma and other organic compounds are not resistant to heat stresses, so in several traditional technologies of food processing significant loss of final product occurs.

In Serbia exists favourable climate-edaphic conditions for development and further improvement of fruit growing especially on family agricultural husbandries. Usage of given conditions considers previous establishment of suitable ambient for quick recovery of complete agriculture and economy. There is a need for defining of developmental programs based on marketing in accordance with available ecological conditions and requirements from contemporary national and international market (*Vukoje, Milic, 2009*).

Water, as the matter, could be present in all three aggregate states, depending on the temperature and by the constant atmospheric pressure. With increase in temperature water changes its' aggregate state: solid, liquid or gaseous (*Ivančević et al., 2003*). When the temperature and pressure are decreased in controlled conditions, in one moment water can be brought into condition that at the same time is solid, liquid and gaseous. This point at which all three states of water are in equilibrium is called the triple point. Triple point for water is under

temperature of 0°C and pressure of 0.006 bars. At pressure and temperature below the triple point, water in form of ice goes directly to the gaseous state - steam (Figure 1). Process of direct conversion of solid to gaseous phase is called sublimation, and for evaporation and drying has to be used the latent heat of raw material. During this process temperature of raw materials is constant, despite the heat dissipation.

Figure 1. Diagram of the triple point



Man was worried with the problem of preservation at that moment when he wanted to save catch or harvested crops for certain time, because of food security (*Tosić et al., 2003*). Food in its original form contains moisture, which is a good basis for the development of various pathogens. In order to prevent the development of pathogens or to preserve food, various forms of preservation are used: drying, freezing, use of various microbiological and chemical processes, storage in hermetic vessels, etc. Preservation of fruits and vegetables by microbiological, chemical and thermal processes in developed world is becoming much less used, while in expansion is preserving by freezing. There are four basic conditions necessary for the functioning of freeze drying process:

- raw materials must be deeply frozen;
- condensation surface must be at a temperature below -20°C;
- system must be able to provide an absolute pressure of minimum 200 mm Hg;
- existence of controlled heat resources (-40°C and +65°C), which will release the latent heat of sublimation for the transfer of ice into the vapor.

The raw materials are delivered as fresh or frozen. It is stored in the warehouse (cold storage) which is projected to for about 500 t of raw material (it was calculated for frozen peas). It consists of two chambers, one with a constant temperature of -20°C and the second where is around 0°C. In second chamber raw material is prepared for drying (unpacking, spreading on the trays, etc.). The fruits have to be frozen for 24 hours at -20°C. On this way prepared raw material is transported to the dryer, where the drying process by freeze drying lasts from 12 to 24 (48) hours, under conditions of low temperature and high vacuum. Dried product is transported to the department for quality control, where organic and metal impurities are removed. After inspection and sampling, dried product is packed in the final packaging, put on pallets and taken to the warehouse for finished products. Trays

and shelves, where the raw materials were during drying process have to be washed and prepared for the new cycle.

Mitrović and Marković (1996) provide an overview of the development of devices for convective drying of fruits; vegetables and herbs while *Brkić et al. (1998)* give the results of convective drying of sour cherry at batch dryer *Seting*.

The aim of this study was to compare the results of freeze drying fruit with classical convective drying method by several authors.

Material and method

Janković et al. (2010) studied raspberry sorts *Willamette* and *Meeker*, with average diameter of 19.40 mm, average weight of fruit 3.92 g, dark pink, pronounced flavour and aroma characteristic for mentioned varieties. Whole fruits of raspberry were freeze dried.
Raspberries were frozen in classic tunnel under the temperature of -35°C and stored in a chamber at -20°C, until freeze drying. Freeze drying was performed in the device Ehrist Alpha I/5, under the desublimers' temperature of -55°C and processing temperature of material of -35°C, as well as in device Edwards at a temperature of -30°C, pressure of 13Pa and the desorption temperature of 40°C. *Willamette* was dried to the final moisture content to 18.86%, and *Meeker* up to 16.15%. Convective drying is performed in a laboratory apparatus with inlet air temperature of 65°C and relative humidity of 6%.

For the freeze drying process *Vračar et al. (2004)* used the raspberry sort *Willamette* harvest 2003, which was prepared and frozen in cold storage in company Vino-Župa Aleksandrovac. Freeze drying was conducted in company Art-Arom Subotica, in semi-industrial device Usi-Prodi made in France, with a batch of 10 kg under the following conditions: condenser temperature -57°C, temperature at the beginning of sublimation -40°C, final temperature of 30°C, vacuum 10^{-3} mbar, eutectic point was empirically determined, freeze drying lasted for 36 h. Chemical parameters of frozen and freeze-dried raspberry were determined by standard chemical methods (*Vračar, 2001*).

Hungarian researchers have examined the fresh fruit (strawberry, raspberry, gooseberry, elder, apricot, sour cherry, apple and cornelian cherry) purchased on the market in Debrecen (*Sipos et al., 2009*). Identical sample was applied at different food preservation technologies. Apples and apricots were cut into pieces 7-8 mm wide, while other fruit samples were washed and dried by classical method. Freezing was conducted as in households, in commercially available freezers. Fresh fruit was frozen to -18°C and kept 3-7 months. Samples were stored before freeze drying in the refrigerator at the temperature of -18°C. Freeze dryer is produced in company Heto Power Dri PL9000 (Thermo - Fisher Scientific Laboratories, USA). Scale of freeze dryer was from -40 to +42°C at 1 mbar. Convective dryer, ie. laboratory desiccators was made by the company Metefem FTL-2004L (Metefem, Hungary). It worked at 40°C for 1-2 days. Dry samples were stored in closed anti-steam plastic bags. Experiments were repeated for three times.

Results and discusion

Within the chemical analysis of fruit samples dry mater, total acidity, anthocyanins and sugars, pH value and L-ascorbic acid were determined. Chemical analysis of dried fruits was performed after rehydration, *Janković et al. (2010)*. Change of the water content in raspberry during the drying process was measured every hour and it ranged at sort *Willamette* from 82.46 to 18.86% after 48 hours of drying, and at the sort *Meeker* from 81.85 to 16.65%.

Convectively dried fruits had slightly lower content of moisture, 9,9%, while at the same time freeze dried raspberry had 11,59% of moisture. Based on the experience, it was determined that at freeze dried fruit with moisture content lower than 10% comes to coronation, due to the mutual friction of packed fruit. Differences in the content of total acid, glucose and pH values did not differ significantly compared to fresh fruit.

Significant difference was noticed in the content of L-ascorbic acid. Loss of L-ascorbic acid in convectively dried fruit was 63.83%, while in freeze dried was 21.28%, *Janković et al., (2006)*. Although the air temperature in convective drying was not to high, change in the L-ascorbic acid content occurred due to activity of oxygen, enzymes, metal ions and transformation into D form. At freeze dried fruit was expected lower loss of L-ascorbic acid. This can be explained by the fact that was dried whole fruit in which the loss is proportional to the square of the diameter. As according to *Karel*, drying time is increase with the square of diameter (*Janković et al., 2004*).

The loss of anthocyanins in the fruit is affected by the same factors that lead to the reduction of L-ascorbic acid, such as higher temperature, presence of oxygen, enzymes, metal ions, etc. At convectively dried raspberry loss was 52.21%, while in freeze dried it was only 1,80% (*Janković et al, 2006*). According to literature, the degradation of anthocyanins is proportional to the logarithm of temperature and is the major cause of loss of colour at pH 2–4.

In fresh raspberry 25 peaks with retention times of 3.79 to 53.06 was found (*Janković et al, 2004*). Comparing with similar retention times peaks, at convective dried and freeze dried raspberries the decrease or loss of certain peaks was noticed, as well as the loss of flavour. In convective drying loss was 49.86% and in freeze drying 16.85%. The loss of aroma in freeze drying process is inversely proportional to the content of dry matter in fruit, and depends of the rate of freezing. When the rate of freezing is lower large cavities appear in the dried matrix, which leads to fall of vapour pressure above the dried layer and later to lower temperature of sublimation of ice fronts at the same temperature of heater.

As very important indicator of freeze dried fruit quality is the level of reduction of volume and porosity. Based on *King (Janković et al, 2004*), change of freeze dried fruit volume in relation to a fresh is low, from 2 to 15%. If due to bad conduction of the freeze drying process comes to afore mentioned collapse of the matrix, it will be get a product which has a large reduction in volume and low porosity. Gained results show that during the process of freeze drying, reduction in volume is very small, only 6%, so in that way dried fruit by shape can be hardly distinguished from the fresh fruit.

Particularly interesting is the extremely high porosity of the freeze dried raspberry. With more than 85% of porosity it remains on the structure like sponge. High porosity on one hand requires very good protection of dried fruits from oxidative changes, as the border area is enormously large. Therefore, the freeze dried products are packed in gas resistant containers, in the atmosphere of gaseous nitrogen instead of air. On the other hand, high porosity has great importance on the speed and level of rehydration.

The reduction of water activity is the essence in food preservation by drying and freeze drying. Activity of any kind of microorganisms could be inhibited when the value of water activity falls below 0.6. From obtained data could be seen that the water activity in freeze dried raspberry was 0.3 and even lower, which promotes it as not favourable environment for the development of osmosis yeasts. Freeze drying process is conducted at lower temperatures so there were no significant changes in chemical composition of raspberry, and the best indicator for the quality of the applied procedure is change in content of thermo-labile vitamin C or L-ascorbic acid. Gained results show that in freeze dried *Willamette* loss of vitamin C was about 17%, and at *Meeker* about 25%, what was significantly lower compared to other drying processes.

The degree of rehydration represents the ratio between fruit weight that was submerged in water for a period of 24 hours at room temperature and weight of same freeze dried fruit before rehydration. Due to the high porosity freeze dried fruits have a relatively high degree of rehydration. Raspberry cultivar *Willamette* had a rehydration degree of 3.27, and *Meeker* 3.36. A slightly higher degree of rehydration was found in the sort *Meeker*, although its porosity was slightly smaller, and that could be explained by the higher content of pectin within the sort *Meeker*.

Results of chemical analysis of frozen raspberry sort *Willamette* (harvest 2003) gained by *Vračar et al. (2004)*, confirmed many results found in literature. They confirm that raspberry is a fruit with low energy value and significant content of the substances that provide to the organism protection organism, as well as medical and dietary impacts. Colour substances in quantities of 0.21% represent anthocyanins which in acidic environment give red colour. Antioxidants are also important, as they protect the human organism from the cardiovascular disease, cancer and other degenerative diseases of ageing. According to the content of vitamins raspberry is not a significant source, particularly in relation to other berry fruit.

According to results of foreign authors researchers about chemical characteristics of fruits, fresh *Cornelian* cherry and strawberries had the highest content of vitamin C, while the lowest values were in apricot and sour cherry (*Sipos et al., 2009*). Phenols have appeared in high concentration within the blue and violet colored fruits. Because of that it is obvious that the sample of elder showed the highest concentration in the fresh material. Similarly, high value of phenolic content was in cornelian cherry, sour cherry and raspberry, while apricots and apples had its lowest level in fruits.

It was noticed that all tested preservation technologies had a significant impact on the content of vitamin C in fruit. The loss of vitamin C by freezing was in average 193%

compared to fresh fruit, by freeze-drying up to 323%, and by conventional drying up to 45.3%. All samples of fruit showed the same tendency.

Cornelian cherry and gooseberry kept their highest relative content of vitamin C, while older apple and raspberry loosed relatively the highest rate, so starting level of vitamin C did not affect the loss rate. Freeze drying and freezing affected almost the same amount of loss in case of sweet cherry and apricot.

Storage technology also affected the total content of phenols in fruits. In average, different types of treatment caused next losses: freezing 15%, lyophilisation 28.1%, desiccation 48.4%, so the tendencies and rates of changes are similar to the content of vitamin C. Differences in this parameter between the results for different types of fruit are less significant. There were only a few percent differences in reducing the total phenolic content between the different treatments.

Authors from the USA mostly worked on quality of freeze dried products, or they tested the impact of freeze drying on quality of dried fruit products. In Table 1 are given the approximate costs for certain raw materials, as well as the costs of energy, and production and sale prices of freeze dried product, determined by the researchers of the *Van Drunen Farms* – USA. Shown data basically support the attractiveness of this technological concept in economic sense.

In Table 2 are presented the data of certain products which are dried in a drum dryer. By comparison of data from these tables next conclusions could be reached: freeze dried products are in average two or more times expensive on the market; for the freeze drying process is necessary to employ more energy; price of freeze dried products cover the cost of drying and potential profit.

Table 1. Drying of fruits by freeze drying, approximate values (*Van Drunen Farms*)

No.	Culture	Needed raw material (kg)	Price of raw material ($/kg)	Cost of energy ($/kg)	Production cost ($/kg)	Selling price ($/kg)
1.	Bilberry, whole fruit	6.8	2.24	1.43	24.64	25.08
2.	Peach, cubes	11.0	1.69	1.21	33.55	36.08
3.	Cranberry	9.5	1.32	1.32	26.33	27.39
4.	Sour cherry	8.0	1.43	1.43	22.17	22.17
5.	Apple cubes	11.0	1.05	1.65	15.62	16.36
6.	Strawberries, whole fruit	10.5	1.49	1.32	31.04	32.25
7.	Apricot	7.0	1.87	1.43	24.86	30.80
8.	Chestnut	9.0	1.54	1.32	27.03	30.14
9.	Blackberries, whole fruit	7.0	3.30	1.32	33.96	35.20
10.	Pear	9.0	1.98	1.32	31.17	31.17
11.	Lemon, chopped	9.0	2.20	1.40	34.07	34.07
12.	Raspberries, whole fruit	6.5	2.20	1.54	25.52	26.40
13.	Orange, pulp	10.0	1.98	1.54	36.96	36.96

Table 2. Drying of fruits by drum dryer, approximate values (*Van Drunen Farms*)

No.	Culture	Needed raw material (kg)	Price of raw material ($/kg)	Cost of energy ($/kg)	Production cost ($/kg)	Selling price ($/kg)
1.	Blueberry	4.75	1.10	5.50	10.72	11.55
2.	Peach	6.0	2.97	5.72	23.54	24.20
3.	Cranberry	4.5	1.32	6.60	12.54	16.50
4.	Cherry	5.0	1.32	5.50	12.10	12.65
5.	Apple	5.0	0.33	4.29	5.94	5.94
6.	Strawberries	8.0	0.99	6.60	14.52	15.18
7.	Pear	8.6	1.21	6.51	16.91	17.60
8.	Blackberry	5.0	1.38	6.60	13.53	15.40
9.	Raspberries	4.0	2.86	5.28	16.72	17.27
10.	Plum	5.0	1.36	4.40	11.22	11.88

Conclusion

According to the research results about the quality of freeze dried raspberries it could be concluded that freeze drying is a very suitable method for drying of sensitive fruits such as raspberry. The results of all analyzes indicate that the quality of convectively dried fruits in comparation to freeze dried is much worse. Advantage of freeze drying is reflected in better preservation of L-ascorbic acid, for about 54%, anthocyanins, for around 51%, lower loss of total flavour, for about 66%, lower volume reduction, for about 92%, higher porosity, for about 49% and better organoleptic mark, for about 51%. All these advantages of freeze drying are realized due to the drying by sublimation from frozen state under the relatively low temperature within the desorption process.

Freeze dried raspberry has a low water content and low water activity, and could be considered as microbiologically safe and permanently preserved if it is stored in appropriate gas-impermeable containers. The porosity of the freeze dried fruit is over 80%, so at first glance they are very little inconsistent to the fresh fruits. Rehydration of freeze dried fruits is fast and good. Changes in chemical composition are minimal, so higher level of preserved vitamin C, anthocyanins and colored matter is very important. Anthocyanins belong to a group of polyphenols, and they are of great importance in human nutrition (they are included to a group of *free radical catchers* with anti-cancer characteristics).

In freeze dried raspberry of sorts *Willamette* and *Meeker* were not found major differences in physical, as well as, in chemical composition and organoleptic characteristics. *Willamette* has larger and more intensely colored fruits than sort *Meeker*, while *Meeker* has higher content of pectin, so all observed differences can be explained by the differences of the characteristics in initial raw material.

In a survey of foreign authors it was determined the reduced amount of biologically active compounds at eight fruit species, at all processing treatments: freezing, lyophilisation and conventional drying. Level of change in different preservation technologies is similar to content of vitamin C and total phenols. In relation to the chemical composition of fresh fruit, freezing resulted in reduction of investigated parameters for 15%, freeze dried for 28-32%

and conventionally dried up to 45-48%. Therefore, freezing is the most favoured procedure for obtaining of all healthy components, while freeze drying keeps the most natural look of preserved fruit, so after rehydration it was received the original taste and shape of fruit.

In some researchers have come to the conclusion that freeze dried products are in average more expensive on the market (for two or more times), since freeze drying process necessary consume more energy. Despite mentioned price of these products covers the costs of drying and gained profits.

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SPECIFIČNOSTI SUŠENJA VOĆA LIOFILIZACIJOM

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Rezime

Liofilizacija, kao relativno nov postupak sušenja u vakuumu pri vrlo niskim temperaturama, obezbeđuje očuvanje svih termolabilnih jedinjenja u početnoj sirovini, dok krajnji nizak sadržaj vlage obezbeđuje mikrobiološku stabilnost i trajno konzervisanje proizvoda. Crvena malina zbog ralativno velikog sadržaja vode (oko 90%), specifične strukture zbirnog ploda, karakteristične svetle boje i arome, nije do sada konzervisana klasičnim sušenjem.

Malina, sorte "vilamet"i "miker" sušena je postupkom liofilizacije i klasično, toplim vazduhom niske relativne vlažnosti. Liofilizacija je vršena u uređaju "Ehrist alpha I/5", pri temperaturi desublimatora –55°C i radnoj temperaturi materijala –35°C. "Vilamet" je sušen do krajnjeg sadržaja vode do 18,86%, a "miker" do 16,15%. Ispitivane su promene u hemijskom sastavu, ukupnoj aromi, oganoleptičkim svojstvima, gustini i zapremini, aktivnost vode, gubitak vitamina C, stepen rehidracije kod osušenih plodova u odnosu na sveže. Dobijeni rezultati pokazuju da se liofilizacijom može uspešno očuvati hemijski sastav, zapremina, aroma i boja maline.

U radu mađarskih stručnjaka ispitivan je uticaj različitih tehnologija za konzervisanje proizvoda: zamrzavanje, sušenje i sušenje zamrzavanjem (frezze-drying ili liofilizacija). Ispitivanja su obavljena u cilju ustanovljavanja kvalitetnih promena na jagodama, malini, ogrozdu, zovi, kajsiji, višnji, jabuci i drenu. Sve tehnologije konzerviranja smanjile su količinu biološki aktivnih jedinjenja, kao što su vitamin C i ukupni fenoli. U odnosu na hemijski sastav svežeg voća, smanjenje ispitivanih parametara rezultiralo je: 15% zamrzavanjem, 28-32% liofilizacijom i 45-48% sušenjem.

Proces liofilizacije u SAD je jedan od postupaka konzervisanja sirovina biljnog porekla (voća, povrća, začinskog i lekovitog bilja). Finalni proizvod ima visoku prehrambenu vrednost, kao i sveže voće i povrće uz prednost da se lako čuva i da ne zahteva nikakve posebne uslove skladištenja. Ovako sušeni proizvodi su osnova za instant supe, pekarske i mlečne proizvode, kao i za slatkiše.

Ključne reči: *Voće, malina, liofilizacija, sušenje, biološki aktivna jedinjenja, kvalitet.*

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INTELLECTUAL PROPERTY RELATED TO TRADITIONAL AND MODERN AGRICULTURE IN SERBIA[1]

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Summary

Agricultural progress has been the most important factor which leads to humans' civilization. The world has progressed in such a rapid manner that traditional agriculture has aggressively been replaced by modern agricultural approaches and methods. Traditional knowledge and innovations relating to food and agriculture are widespread, viable and sustainable. The subject matter of protection traditional knowledge may include agricultural, environmental and knowledge associated with genetic resources. Protection of the traditional knowledge and results of the modern agriculture, under existing models of intellectual property rights could involve: copyrights, patents, plant varieties, trademarks, geographical indications and appellations of origin. While patents protect new and inventive products and processes, geographical indications protect traditional knowledge and skills associated with certain products which are typically passed down through generations, and have a strong link with the underlying geographical territory.

Key words: *intellectual, property, traditional, modern, agriculture*

JEL: *K49, Q19*

Introduction

A special attribute to protection of traditional knowledge in the field of agriculture is enhanced by adoption of the (Convention on Biological Diversity, CBD, Nairobi, Kenya, 2000) [14]. In the years that followed, the protection of traditional knowledge in many countries is approached in organized and systematic manner. However, dichotomy

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between local, traditional and scientific knowledge is taking a stand for discussions and new researches. Scientific workers and experts are looking for answers to the questions such as: how do traditional and scientific knowledge make an impact to ecology; does organic agriculture provide for sustainable diversity?

Specifically important is to stipulate a relationship between the Convention on Biological Diversity and the Agreement on trade aspects on intellectual property rights, which, among other things, defines patents, trademarks and geographical indications and appellations of origin [11]. As a result thereto, the human environment protection was focused to be of specific care, in providing quality and safe food and the implementation of intellectual property into the development programs subject to elevate the products' value.

Elements of Intellectual Property

Intellectual property (**IP**) is a sum of property and moral rights which protect certain intellectual properties, under the legal terms and conditions and with certain limitations. The intellectual property includes copyrights and related rights and industrial property, patents, trademarks, design protection rights, geographic indications and appellations of origin, protection of plant varieties. According to the Serbian Patent Law [23] and international patent conventions (the Agreement on Trade Related Aspects of Intellectual Property Rights, TRIPS [11] and European Patent Convention, EPC [15]), a **patent** is territorial, exclusively monopolized, and timely limited right to 20 years from the day of patent application filed, recognized as invention in whatever technical field, which is new, with inventive level of approach and industrially applicable. EPC and the Serbian Patent Law have retained the following exceptions of patentability: ''Methods for treatment of the human or animal body by surgery or therapy, and diagnostic methods practiced on the human or animal body; plant and animal varieties and essentially biological processes for the production of plants and animals'', (USA Patent Law doesn't fall in such type of exception [31]). The **trademark** is the right which protects the trademark in trading to different goods, i.e. services of an individual or legal entity against identical or similar goods, i.e. services of other individual or legal entity. The trademark is valid for 10 years but can be unlimited. The longer it is used, the more recognized it is, its value increasing along with the value of goods and services it marks [24]. **Industrial design** means legal protection of exterior (three dimensional or two dimensional) of industrial or craftsman product [25]. According to the TRIPS Agreement the member counties are free to regulate protection of geographical indications at national level, provided it complies with the minimum standards set by TRIPS. As a result, certain countries, such as the US, argued that geographical indications (GI) are sufficiently protected under existing trademark laws, but the European Union demanded *sui generis* protection and the establishment of a multilateral register [1]. According the Law on **geographical indications** of Serbia, the geographical indications are name of origin and appellation of origin. It is used to mark natural, agricultural, foodstuff and industrial products, craftsmanship products and services. The stipulations of the subject law are not applicable to wines and brandies as it is defined by special regulations. Appellations of origin is the appellation which identifies

a certain product as the product from a defined territory (country, region or location), which quality, reputation or other traits can be attributed to its geographic origin where to its production and /or processing and/or preparation are proceeded at a defined and limited region [26]. **Plant varieties** are protected by a special law which regulates rights of plant sort selectors [21].

Protection of Intellectual Property in Modern Agriculture

Inventions in modern agriculture are frequently based on biotechnology [2]. Modern biotechnology, which involves a number of techniques used to convert organically certain biological matters (cells or chains of plant and animal cells, enzymes, plasmids and viruses), transformations in micro-organisms, in plants or animals or to provoke changes of inorganic matters biologically, provides for a vast opportunity to inventions and patent protection. By introduction of alien gene into micro-organism which is a recipient either in fertilized egg or embryo cells, transgenic organisms are generated which could have various useful applications but can also increase risk to human and animal health. The generated transgenic plants became a very lucrative system for the production of biomaterials or pharmaceutical raw materials. By genetic modifications in plants, the yields increase as well as contents of useable matters. The new generated plants are resistant to frost, plant viruses, insects and other pests or tolerant to herbicides. Introduction of patent rights and possibility of technology transfer lead to increasing interest for such projects and more sizeable number of investors involved [7,8].

Cooperation between the World Trade Organization (WTO) and the World Intellectual Property Organization, **WIPO**, led to adoption of the Agreement on Trade Related Aspects of Intellectual Property Rights (**TRIPS**) [11]. TRIPS thus provided for harmonized regulations on international level and affirmation of intellectual property. In the field of patent rights, TRIPS stipulates that patents may be assigned for inventions, either products or procedures, in any field of technologies, if they are new, incorporate inventive level and suitable for industrial application. However, the members of WTO may exclude from patentability (art. 27.4b): plants and animals except microorganisms, essential biological procedures for production of plants or animals except non-biological or microbiological procedures. The members of WTO are to provide protection of plant varieties either by patents or *sui generis* system or by combination thereof. Compared to patent protection of plants and plant varieties, the two systems are accepted worldwide: patent system in the USA which does not recognize exception related to patentability, the patents can protect plant and animal varieties, there is a system to assign patents for plants (The Plant Patent Act) and protection of plant varieties selectors rights [31]; and the system according to the European Convention Patent (ECP) which includes exceptions related to plants and animals varieties patentability whereto the countries define protection of varieties by a separate law [15]. In addition to the regulations contained in the ECP, the adoption of the Biotechnological Directives EC 98/44(1998) is important for the members of the European Union which additionally regulates the subject field [12]. According to the Directives, the biological material isolated from the natural environment or produced by applying technological procedures, can be the subject of innovation although

already present in the nature. The following are not considered patentable: a) plant and animal varieties; b) essential biological procedures for growing and breeding plants and animals. Thereof, in those countries which coordinated their regulations with the European Union, the inventions which refer to plants and animals can be patented if the innovation application is not technically limited to a specific plant and animal variety, i.e. possibility to be awarded patent depends on level of improvement and innovation within the innovation introduced by a human. The biological materials, prior to filing the patent application is to be deposited in the depositary institute according to the Budapest Treaty on international recognition of the deposit of micro-organisms for the purposes of patent procedure [13].

Intellectual property rights (and their realization and valuation) are very important in the field of the agriculture, especially patents, trademarks and geographical indications [4-6]. Intellectual property (IP) valuation is, actually, a conscious process aimed at determining the monetary value of underlying IP assets. There are three generally accepted accounting theories for valuing patents and trademarks: market, cost, and income [6]. Market theory values and asset as the present value ascribed to similar assets in an active public market; the cost theory values an asset by the cost of replacing the asset; and the income theory values an asset by the present worth of the net anticipated economic benefit of the asset. Depending on the legal system granting protection to geographical indications, issues of control and valuation are differently. It is important to say that in the US model of the protection GI, in contrast to trademarks, which are distinctive signs identifying goods of an enterprise and thus not limited by territorial link, geography is at the heart of geographical indications (Marsden 1998). In developing countries, it is important to identify the economic issues relating GI protection on the national and international level, especially their national intellectual and cultural heritage as well as their biodiversity [1], what is especially important for rural development [10].

Patent Related Regulations and Practice in Serbia

Although Serbia is not the member of the European Union, the Law on Patents (2011) [23] is accorded with the ECP and the text of the Law contains certain regulations of the Biotechnological Directive EC 98/44. The regulations of the Law related to the subject of the protection gives a detailed explanation of the biological material. The article 7 it is stipulated: "The subject of the innovation to be protected by patent rights can be a product or procedure, use of the product and use of the procedure". Also, the subject of invention to be patent protected can refer to:

1) Product consisting of biological material or contains biological material;
2) Procedure by which the biological material is produced, treated or used;
3) Biological material which is isolated from natural environment or produced by technical procedures, even if already existing in the nature.

The practice to assign patents in the field of biotechnology by the Intellectual Property Office of Serbia (former Yugoslavia) is coordinated with the practice of the European Patent Office [20]. Therefore, the patent **YU 48600 B** is assigned, for the patent application P-1398/88 , "Procedure for gene transfer in plants" .The patent claims which refer to transgenic

pollen, seeds and product propagation were not accepted since it could derive variety protection. There are three interesting patents of the Serbian inventors (Lazar Avramov and Darinka Stokic) which protect innovations that could contribute to development of organic agriculture and refer to organic fertilizers-substrates which contain: micro-organisms, viruses, microbes, fungi (mildew), enzymes, ferments or matters that being generated or being extracted from micro-organisms or animal materials, titled: "Procedure to obtain substrates to revitalize soil and to stimulate growth and fruitfulness of grapevines" **YU49181 B,** P-543/96; application to fruit trees **YU 49350 B**, P-586/96; with horticultural and garden plants **YU 49351 B**, P/619/96. Attention should be paid to the patent **RS 49990 B**, P-437/01, "DNA sequences related to maize transformant **PV/ZMGT** 32 (**NK603**) and preparations and methods for its detection", protects DNA molecule which contains nucleotide sequences identified as **SEQ ID** no. 7: or **SEQ ID** no. 8.

Plant Variety Protection

Complexity of the procedure to generate new plant varieties, size of investments and economic results issues, a need to regulate the trade of plant reproduction materials, providing intellectual property is protected, had an impact to organize the International Union for Plant Variety Protection (**UPOV**). According to the International Convention on Protection of New Plant Varieties [17], the variety defines a group of plant within a unified taxonomic category of the lowest recognized level, whereas that group, regardless to entirely fulfilled conditions and terms to recognize the rights of the grower, may defined through researches into the characteristics which are the result of genotype or a combination of genotypes; to differ from any other group of plants by expressing at least one of the mentioned characteristics and be considered a unit since it multiplies unchanged. The plant variety is protected, i.e. grower's rights are recognized when it is confirmed by testing that the new plant variety is distinctive (Distinct), uniform (Uniform) and stable (Stable) by applying related DUS growing tests.

Serbia has achieved significant results in creating and protection of new plant sorts but is not yet the member of the UPOV Union [21].

Protection of Traditional Knowledge

In addition to adoption of separate legal regulations for the protection of traditional knowledge, WIPO points to the fact that products based on traditional knowledge can be protected even on the grounds of the existing laws which protect the elements of the intellectual property [30]. Thus, if, apart from the traditional knowledge, the product is innovated, incorporates the elements of new approaches and inventions, it is possible to protect the patent. The product will be trademarked, it can be a protected design but the broad opportunities are in the field are geographic indications and appellation of origin. It is of utmost importance that the national institutes for intellectual property include relevant documentation referent to traditional knowledge into data bases to check states of techniques and thus will prevent to assign patents for innovations based exclusively on

traditional knowledge. There is also a need to put together a national registry of the traditional knowledge based products, to be published and available to the public. Entitled to traditional knowledge have the right based on traditional and modern intellectual property rights since the contents of their knowledge is implemented at both levels. One of the problems in the protection of traditional knowledge/intellectual property is the collectivity in creation and properties of traditional knowledge. The problem could be resolved by guiding activities, i.e. checking the options for collective assignment of the rights by associations, holders of traditional knowledge. The protection and affirmation of the traditional knowledge can substantially contribute to rural development, i.e. development of each local community. In the European Union for agricultural products and foodstuffs exists the legal framework provided by Council Regulation (EC) No 510/2006 (enforced within the EU and being gradually expanded internationally via bilateral agreements between the EU and non-EU countries), promoting and protecting origin-labeled products. Actually, three EU schemes of geographical indications and traditional specialties known as protected designation of origin (PDO), protected geographical indication (PGI), and traditional specialty guaranteed (RSG) promote and protect names of quality agricultural products and foodstuffs [16].

Protection of Geographical Indications in Serbia

The Strategy of intellectual property development of Serbia for the period 2011 to 2015 [18], within the framework of activities, a special accentuation is given to a necessity to finance protection of geographical indications and appellations of origin of traditional and specific products [9]. At the beginning of 2011, 55 products were protected by the geographical indications and appellations of origin in Serbia, wherefrom 40 of them locally (to mention some of them: "Sremska domaca kobasica (Domestic sausage of Srem)", "Sremska salama (Salami of Srem)","Sremski kulen (Spicy sausage of Srem)","Banatski rizling (Riesling wine of Banat)", "Vrsacko sampion pivo (Champion Beer of Vrsac)", "Kladovski kavijar (Kladovo caviar)", "Apatinsko jelen pivo (Jelen beer of Apatin)" "Karlovacki rizling (Riesling wine of S. Karlovci", "Bezdanski damast"). A small number of protected trademarks have authorized users (only 14 of them, among which: "Futog fresh cabbage and sauerkraut", "Krivovirski kackavalj (Hard cheese of Krivovir, "Homoljski med (Homolje honey)", "Valjevski duvan cvarci (Special smoked lardons of Valjevo)", "Svrljiski belmuz (Svrljig hominy)".However, only one of the products is protected in the European Union "Homolje honey" in accordance with the Lisbon arrangement. There is also a public notion that "Futog sauerkraut" is in the international procedure for protection [19]. The Ministry of agriculture, trading, forest and water engineering of Serbia supports the projects which refer to traditional products through protection of geographic appellation of origin but also provides assistance to make them publicly affirmed and commercially available. Such products are, for example: "Leskovacki ajvar (Serbian spread of roasted eggplants & red peppers (or ajvar) from Leskovac)" "Zlatarski sir (Semi-hard cheese of Zlatar)", "Sjenicki sudzuk (Unique beef sausage of Sjenica)", "Sremski kulen (Spicy sausage of Srem)" [27].

Development of Organic Production in Serbia

The organic production understands production of agricultural and other products by applying methods of organic production at all stages, from generating raw materials to final products, their packing, storing. It is based on natural processes and utilization of organic materials. The organic production excludes application of genetically modified organisms and products and use of ionizing radiation. It is not allowed to use synthetic or chemical agents for protection and nutrition of plants, or synthetic drugs, growth stimulants, hormones. The organic production is based on four principles: health, ecology, reliability and care. The integral part of the sustainable production system includes reasonably coordinated environment protection system (healthy environment, biological diversity, respect of biological cycles). The organic product is a certified product which holds the mark, incorporates warranted quality and health safety.

The organic production in Serbia has been developing for the last twenty years [3]. As a beginning of the organized approach to the organic production there could be mentioned the activity of the association Terras from Subotica and the formation of bio-school *Terras* [29]. The Law on organic production (2010) [22] is coordinated with the regulations of the European Union. A national association for organic production development of Serbia was established and titled *Serbia Organic [28]*. In order to stimulate organic production development in organized way there are four regional centers: at Selenca, Valjevo, Svilajnac and Leskovac. The Company "Zdravo Organik" of Selenca has a large number of cooperatives in Serbia, and it is considered to be one of the most modern companies for fruit and vegetable processing in the region, their products are exported to the markets of the European Union, America and Japan. The registered geographic appellations of origin from the regions rich in traditional knowledge and suitable for development of the organic production represent significant potential for the production and marketing of valuable products.

Conclusion

Intellectual property is important not only in the field of modern agriculture based on the science, but also in the field of traditional agriculture. A relationship between modern and traditional agriculture is best seen in the organic production. To protect biodiversity and human environment, production and safe and quality products by respecting principles of sustainable development are possible if applying traditional knowledge and modern scientific achievements. The protection of traditional knowledge, geographical indications and appellations of origin, patents, plant varieties, trademarks, i.e. intellectual property is of importance to establish reputation of the products warrants the quality and enhances product value. In Serbia, the importance of such approach in the development of agriculture is recognized and the goals are reached in organized and systemic manner. At the national level, numerous geographical indications and appellations or origin are applied to protect products which are the result of traditional knowledge but yet more is to be done to commercialize and to affirm them, as well as to protect and market such products, especially in the countries of the European Union.

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ITELEKTUALNA SVOJINA U TRADICIONALNOJ I MODERNOJ POLJOPRIVREDI SRBIJE[5]

Slobodanka Jovanović[6], Sonja Sikora[7], Slobodan Petrović[8]

Rezime

Poljoprivredni napredak je najvažniji faktor koji dovodi do snažnog razvoja civilizacije. Svet je napredovao na takav način da je tradicionalna poljoprivreda brzo i agresivno zamenjena modernim poljoprivrednim pristupom i metodama. Danas su tradicionalno znanje i inovacije, koji se odnose na hranu i poljoprivredu, rasprostranjeni, životni i održivi. Zaštita tradicionalnog znanja može da uključuje znanja iz oblasti poljoprivrede, životne sredine i genetičkih resursa. Zaštita tradicionalnog znanja i rezultata moderne poljoprivrede prema postojećim modelima prava intelektualne svojine može da obuhvata: autorska prava, patente, zaštitu sorti, žigove, geografske oznake porekla i oznake (imena) porekla.Dok pateni štite nove i inovativne proizvode i postupke, geografske oznake porekla štite tradicionalno znanje u odnosu na izvesne proizvode,koje je generacijama proveravano i tipično za određenu geografsku teritoriju.

***Ključne reči**: intelektualna, svojina, tradicionalna, moderna , poljoprivreda*

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FORMER AND FUTURE REFORMS OF COMMON AGRICULTURAL POLICY OF THE EUROPEAN UNION

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Summary

The European Union marks fifty years of existence of Common Agricultural Policy. This policy has been reformed since 1962 to date in accordance with the circumstances prevailing in the Union and diverse impacts from the international market. The fact that the European Union has grown from a union of six states into a union of twenty-seven states is sufficient to justify numerous reform interventions within the Common Agricultural Policy. The aim of the present paper is to analyze the former course of development of the most integrated policy of the European Union, as well as the proposals for its future reform. Considering the obtaining of candidacy for membership and forthcoming actualization of the negotiations between the Republic of Serbia and the European Union in every, accordingly, in the segment of agriculture, the authors of the present paper deem important to perceive the current changes in the European agricultural policy.

Key words: *European Union, Common Agricultural Policy, Reforms, Subsidies*

JEL: *Q18*

Introduction

One of the reasons for the union of European Countries and cornerstone of the European integration – Common Agricultural Policy, is marking its fifty years of existence in 2012. Five decades of certainty in supply of European consumers with agricultural and food products are deemed the most valuable contribution by the Common Agricultural Policy. Nevertheless, the care for providing sufficient food quantities that has kept the citizens of the European Union occupied during the sixty years of the twentieth century was replaced by a tendency towards sustainable use of natural resources and cutting down the negative effects of the climate change.

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The current global circumstances are marked by the accumulated issues related to economic and social development and consequences of a direct economic crisis that has affected the European Union as well. For this reason a new reform of the Common Agricultural Policy is necessary, hence, the marking of fifty years of its existence may serve as an ideal occasion to organize numerous debates on its future and make a significant shift in its orientation. In addition to the entities that are directly or indirectly related to the agricultural sector, the Union has estimated that it would be highly advantageous for the future reforms of the Common Agricultural Policy to involve citizens in the discussions as consumers of agricultural-food products. Accordingly, equal participation in the creation of a new Common Agricultural Policy is taken by: the European Commission, other Union institutions related through their work to the agricultural sector, farmers associations, various non-government organizations and representatives of local rural communities.

Initial aims of the Common Agricultural Policy of the European Union

Considering that the European Union was faced with the deficit of agricultural food products after the end of World War 2, it tried to resolve its food self-sufficiency by applying adequate measures of agricultural policy. It is no wonder, therefore, that the policymakers of main principles and aims of the Common Agricultural Policy were preoccupied in the course of fifty years of the past century with finding, first of all, a way to significantly increase the agricultural production within the European "six". It was impossible to imagine at the time that just a couple of decades later, the key problems in the domain of the agricultural sector will be the growing budget burdens caused by financing of enormous stocks of basic agricultural products.

It is necessary to point out that with the creation, namely, starting of implementation of the Common Agricultural Policy after 1950, an idea was conceived to introduce a multinational cooperation in the domain of agricultural sector in Western Europe, which was actually the first step on the route of development of the Common Agricultural Policy. Encouraged by the success of cooperation within the European Community in the domain of coal and steel, the European Council began negotiations on establishing cooperation and integration in the sphere of agriculture. A debate was launched by presenting proposals of all member countries for the framework of common policy for orienting the development of the agricultural sector. The proposal presented by France that a Common Agricultural Policy needs to protect an increase of production and preservation of economic vitality of family farms with stable prices, not just in the interest of the farmers but also in the interest of consumers, in spite of the numerous disagreements that were clearly exhibited on the line France – Germany received a unanimous support at the Council. This established an initial basis for negotiations which were continued within the Conference on organizing the European market of agricultural products. A Ministerial Conference on food and agriculture was held within the Organization of Economic Co-operation and Development (OECD), with the presence of Great Britain, which was a further shift towards establishing the Common Agricultural Policy.

This was followed by the preparation of the proposal of the Roman Treaty on establishing

the European Economic Community and the Euroatom. Although the position of certain West European countries differed significantly on the issue of Common Agricultural Policy, it was agreed at this meeting, nevertheless, that the main element for the introduction of this common policy would be the elimination of trade barriers between the member countries as well as harmonization of instruments of their agricultural policies.

The European Economic Community was formed by signing of the Roman Treaty by France, Germany, Italy, Belgium, The Netherlands and Luxembourg on March 25, 1957. Article 39 of the Roman Treaty defines the initial goals and principles of the Common Agriculture Policy – CAP. Considering the fact that the Community was producing at the time only 80% of its total needs for agricultural-food products, the initial goals of the Common Agricultural Policy were:

1. raising the productivity based on implementation of technical progress and development of agricultural production based on optimum use of all production factors;
2. ensuring fair standard of living for the farmers;
3. securing market stabilization;
4. securing safety in food supply; as well as
5. securing prices of agricultural-food products acceptable to the consumers.

Three principles of the Common Agricultural Policy were defined in order to realize the subject goals. The first principle, formulated as a principle of *market unity,* meant in practice the removal of customs and other barriers to agricultural-food products in the e between member countries. *Community preference (predominance),* defined as the second principle of the Common Agricultural Policy, implies giving priority to the Community in satisfying the need for agricultural-food products in the form of protection from import. The third principle that serves as a foundation of the agricultural policy of the Community is the *financial solidarity,* namely, common financing of all measures and mechanisms of the Common Agricultural Policy by the member countries.

The Common Agricultural Policy, based on the respective principles, began to be implemented in 1962. It provided numerous positive effects already in the first decade of its implementation. Namely, through implementation of the system of guaranteed prices, import protection as well as market interventions, the Common Agricultural Policy facilitated self-sufficiency in the production of certain agricultural products, market stability and income growth of agricultural producers. However, at the same time, certain negative consequences of implementation of Common Agricultural Policy mechanisms began to show up. Financing of sale of surplus of certain agricultural produce and export subsidies led to rapid growth of budget costs. An extremely protected market and protectionist's price policy led the Community to straining of relations with its traditional trade partners, advocates of liberalism. Considering that the level of paid subsidies was directly proportionate to the scope of production, the differences appeared in the level of income between individual categories of agricultural estates. Furthermore, pronounced intensification of production and implementation of chemical inputs caused a growing devastation of natural resources and environmental problems.

Former reforms of the Common Agricultural Policy of the European Union

Due to accumulation of its negative effects, the first attempts of reforming the Common Agricultural Policy ensued already by the end of the 60ies. The initial steps in the reform, embodied in the documents «Memorandum on reform of Common Agricultural Policy (The Mansholt Plan)» from 1968, then «Program on structural policy in agriculture» from 1972 and «Green paper» from 1985, nevertheless, did not result in significant effects. The first radical changes of the European agricultural policy, conceived and realized in the course of the Uruguay Round of international trade negotiations, was actualized in the form of the MacSharry reform from 1992.

The reform of the Common Agricultural Policy Reform from 1992, called that after the European Commissioner for Agriculture at the time Ray MacSharry, was initiated both by internal as well as external pressures. The irrepressible growth of surplus of individual agricultural-food products, difference in the level of income of individual categories of farmers, high budget expenditures, pressures by the international market, as well as extension of the Community with new members have led to a wide-reaching reform of the Common Agricultural Policy. With the price cut of cereals and beef, payment of compensation of farmers for exemption of land from production (set-aside system) as well as compensation for extensification of cattle production, the MacSharry reform made a significant step in the transition from price to direct support of the European agricultural producers. For the first time in the history of the Common Agricultural Policy the so called accompanying measures intended to stimulate rural development. The effects of the MacSharry Reform, however, were not in accordance with the originally set goals. Although reduced, the prices of individual agricultural-food products were still above the world level, in the surplus production sectors they still remained excessive, and thereby the growth of the budget costs continued. An indication of the solution to the above problems, continuous followers of the Common Agricultural Policy, began to be discerned in the outlines of the new reform known as Agenda 2000.

Adopted by the European Commission at the Berlin summit in 1999, Agenda 2000 represented an action program for a six-year period covering all macroeconomic segments of the European Union, agriculture as well. The priority goals set for the reform of the Common Agricultural Policy within Agenda 2000 are:

1. cutting down the price of agricultural products, in order to meet the requirements of international trade agreements;
2. redistribution of support to agriculture, in order to eliminate obvious differences in the level of income between individual regions and producers;
3. creation of a Common Agricultural Policy that would be acceptable to the citizens, namely, consumers;
4. simplification of measures for managing the agricultural products market, which applies particularly to the new members; as well as
5. creating a model of multifunctional agriculture and securing rural development.

The major turn brought about by the implementation of the Agenda 2000 was defining of a policy of rural development as the "second pillar" of the Common Agricultural Policy (Piccinini and Loseby, 2002). However, this change was just a declarative support by the creators of reforms of rural development. Although the sector of rural development was regulated by norms, the predominant part of the assets was oriented to the "first pillar" of the Common Agricultural Policy, the market support measures.

The unresolved problems from the previous period, pressure by the World Trade Organization and planned "east" extending of the European Union, as well as the changes in preferential consumers inevitably led to further changes in the manner of functioning of the European Agricultural Policy. Nevertheless, one should not forget that the Agenda 2000, as a reform intervention, brought several important novelties. Namely, for the first time the so called environmental principles and sustainable agricultural production appeared as criteria for the use of subsidies. Furthermore, with the Agenda 2000 the term multifunctionality was introduced for the first time in the agricultural policy of the European Union.

Common Agricultural Policy had endured fundamental reform in June 2003, which created long-term perspectives for sustainable agriculture and rural development (Cvijanovic et all, 2011). The reform of the Common Agricultural Policy in 2003, better known under the name Fischler reform (Franz Fischler) was carried out with the goal to continue the changes initiated in the previously implemented reform interventions, in the direction of reduction of measures with distorsive impact on the world market. Particular attention within the Fischler reform was paid to the improvement of implementation of the rural development program. Namely, a new policy of rural development for the period 2007 until 2013 was adopted in 2005 as an integral part of the reform packaged. Still, the changes in the mechanism of support to the producers are deemed key changes introduced by the Reform from 2003. In addition to lowering the intervention prices for certain agricultural-food products, a single farm payment scheme was introduced. Policy modifications under the Common Agricultural Policy Health Check agreement of 2008 followed the direction established in 2003 by further decoupling direct payments, increasing the rate at which payments are modulated and allowing Member States to switch from historical to regional flat area payment regimes (Erjavec and Salputra, 2011).

The single payment scheme, considered the most significant element of the Fischler reform, was introduced in 2005. In practice this scheme means that the farmers are paid subsidies, whose amount does not depend on the scope of production. This in essence eliminates the relation between the production and subsidies (support), and provides the European farmers with greater freedom to behave as market-oriented producers. Therefore, it is within the competence of all member countries to subsidize their farmers, besides the established support on the Union level, or to subsidize them partially or with their own funds, and that until 2008. (Kelch and Normile, 2003). The introduction of the scheme is a unique way conceived to upgrade the environmentally and economically sustainable agriculture. Namely, the criteria based on which the farmer's right to use the payments is determined is upholding the environmental principles, namely, production of safe quality food, providing the welfare and preservation of natural resources. Furthermore,

considering that the support measures that have a negative impact on the stability of the world food market are significantly cut down, it is anticipated that this reform of the Common Agricultural Policy will cause the strengthening of the position of the European Union in the negotiations with the World Trade Organization. As it is obvious from the observed reform course of Mutual Agricultural Policy the essence of changes commencing in 2003 is reflected in transformation of Mutual Agricultural Policy to the Mutual Policy of Sustainable Agricultural and Rural Development (Markovic, 2005). The ultimate objective of creators of that reform is recognized in creation of efficient, and in context of rational utilization of natural resources, sustainable agriculture, together with preservation and improvement of natural resources.

The following step towards modernization and higher degree of market targeting of Mutual Agricultural Policy has been realized during CAP Health Check in 2008. On the 20th of November 2007, Ministers of Agriculture of European Union reached political agreement on universal review of European agricultural policy. That reform included the following:

1. abolition of set aside system;
2. gradual increase of milk quotes up to their complete abolition in 2015;
3. conversion of market intervention to genuine safety net;
4. decrease of direct support and allocation of funds to EAGDF.

All above mentioned measures will lead towards better facing of European agriculture with challenges connected to climate changes, better management of water resources, preservation of biodiversity and green energy production.

Current Common Agricultural Policy of the European Union

Since the beginning of its implementation the Common Agricultural Policy of the European Union passed through several complex reforms. The share of the Common Agricultural Policy in the budget of the European Union, under the influence of internal and external pressures, was reduced by almost 70%, the percentage in the seventies of the past century to 34% in the period 2007 until 2013. The cost reduction of the Common Agricultural Policy is a result in part by the last great expansion of the European Union, namely, the admission of twelve new countries since 2004.

After the last great reform in 2003 the Common Agricultural Policy is presently founded on two main pillars:

1. 1st Pillar – direct payment and market intervention. After the reform of the Common Agricultural Policy conducted in 2003 significant changes took place in the direct payments segment. There is a tendency to gradually eliminate payments related to production and have production free subsidies take up their place. The new model of subsidizing inevitably led to extensification and significant changes in the structure of production because the producers are not stimulated any more in a system of direct payments to realize a greater scope of production. Contrary to the previously established

system of incentive, the system of direct payment is based on the requirements of *cross-compliance*. *Cross-compliance* means that the extent of payment, namely, incentive to the producers depends on the extent to which the producers uphold the rules related to environmental protection, safety of food and welfare of the domestic animals.

A lot of credit for the exceptionally good position of the European Union on the world food market goes to the complex system of market interventions, as an integral part of the Common Agricultural Policy. The support to the producers' income is realized through the implementation of various types of intervention buy offs, withdrawal of the products from the market, but also by implementation of foreign trade regulations. The market interventions system also includes the measures of support of certain agricultural-food products.

2. 2nd Pillar – rural development policy. This pillar of the Common Agricultural Policy and assets from the fund intended for rural development provide the support to structural enhancement and implementation of new technologies ensuing that the living and working conditions in the rural areas of the European Union meet the requirements of the population. Considering that half of the population of the Union lives in rural areas, this segment of the Common Agricultural Policy is deemed extremely important. The three axes of rural development policy include (Visek, 2007):

   - Axis 1. Measures for strengthening competitiveness of agriculture and forestry;
   - Axis 2. Measures for protection of environment as well as the rural areas; and
   - Axis 3. Measures for improvement of quality of life in rural areas as well as measures for stimulating diversification of economy.

In addition to the three axes mentioned above, the Common Agricultural Policy also contains a horizontal axis, that is, LEADER (Liason Entre Actions de Developpement de l'Economie Rurale – Links between actions of rural development). Since its introduction in 2007 the LEADER approach has shown goods results in the area of rural development, and the key to success of this approach lies in great part in its pragmatism. Namely, LEADER is a type of a "tool" in the policy of rural development that provides answers to the questions "how" to do something, and not "what" to do. Considering that this is an approach for links between actions of rural development, LEADER can apply, in fact, to any one of the three axes of rural development.

The financing of the agricultural policy of the European Union is one of the key issues related to functioning and reform of this policy. The Interinstitutional Agreement on Financing the Common Agricultural Policy adopted in May 2006, pertaining to the period from 2007 until 2013 is currently in force. According to this Agreement, the current financial framework consists of six chapters (Živadinović, Milovanović, 2010):

- sustainable development;
- natural resources: agriculture, rural development, environment and fishing industry;
- freedom, security and justice;
- EU as a global player;

- Administration; and
- compensation (for newest expansions of the European Union).

Table 1. Distribution of budget assets of the European Union for the period 2007 – 2013.

Purpose	Budget share (in %)
Sustainable development	44.6
Natural resources: agriculture, rural development, environment, fishing industry	42.5
Fundamental freedoms, security and justice	1.3
EU as a global player	5.7
Administration, etc.	5.9

Source: European Commission Directorate-General for Budget (2010): *The European Union budget at a glance,* Publications Office of the European Union

The importance of agriculture and thereby of the Common Agricultural Policy may be seen in the structure of the European budget. The share of expenditures for the Common Agricultural Policy, which include agriculture, rural development, environment and fishing industry, is second on the list of priorities and amounts to as much as 42.5% of the total European Union budget.

Distribution of assets, presented in Table 2 shows that the expenditures from 2007 until 2013 for the 1st pillar of the Common Agricultural Policy are three times greater than the expenditures for the 2nd pillar in the same period.

Table 2. Budget of the Common Agricultural Policy during the period 2007 until 2013.

Budget purpose	Budget of the Common Agricultural Policy (in billion EUR)
1st Pillar – direct payments and market interventions	293.105
2nd Pillar – rural development	69.750

Source: House of Lords, European Union Committee (2008): *The Future of the Common Agricultural Policy*, 7th report of Session 2007-08, Published by the Authority of the House of Lords, London: The Stationery Office Limited

Although the European Union is advocating the reduction of budget expenditures for agriculture through several of its last reforms, they can still be estimated as relatively high. Namely, out of a total of 141.5 billion EUR of budget assets in 2010, as much as 59.5 billion EUR (42% of the total Union budget) was earmarked for preservation and management of natural resources. This item also includes the costs of rural development, environment and fishing industry, but also for market support and direct payments. The same trend continued in 2011. From a total of 141.9 billion EUR in the budget, 58.7 billion EUR, namely 41% of the budget assets were earmarked for the costs related to the market, direct payments, rural development, environment and fishing industry. The budget draft for 2012 is 147.2 billion EUR, and the assets intended for agriculture and rural development amount to 40.8% of that amount.

The future of the Common Agricultural Policy of the European Union

As the leading world importer of food and the most significant market for sales of agricultural products from the developing countries, the European Union has recently reformed its support system with view to reduction of distorsive effects in the world market. Within the Doha round of multilateral trade negotiations the European Union proposed the elimination of all import subsidies until 2013, as well as significant reduction of import duties on agricultural products.

In spite of the reforms carried out in the several past years, significant reform undertakings are expected only after expiration of the existing funds, namely, in the course of 2013. In the attempt to reconcile the global trends in food production and expectations of domestic consumers the European Union presented several proposals for the future reform of the Common Agricultural Policy. Overcoming of the world food crisis has determined the global attempts to double the food production by 2050 (FAO, 2010) and to take more care of preservation of biodiversity, soil and quality of water resources in agricultural production. The European consumers, on the other hand, expect the Common Agricultural Policy to enable the farmers not just to produce foods, but also that the priorities in such production are preservation of natural resources, securing the welfare of the domestic animals, as well as establishing of economic and social sustainability of rural communities. Due to everything stated above the new Common Agricultural Policy should be conceived so as to enable a sustainable development of agriculture based on innovations, research and dissemination of know-how so as to put the European farmers in a situation to adequately respond to the demands of the future.

The three essentials goals of the Common Agricultural Policy today are: secure supply of food to the European market, preservation of natural resources and balancing the territorial development. In other words, European Union should use strong Mutual Agricultural Policy to provide for smart, inclusive and complete development in rural regions (EC, 2010).The new instruments should make the Common Agricultural Policy of the European Union "greener, more equitable, efficient and effective".

Pursuant to EU strategy established for the period until 2020, substantial changes in structure of both columns of Mutual Agricultural Policy are expected. Substantial changes which will provide for inclusive, sustainable and smart development of rural Europe should be realized in the following manner. In the framework of the first column the "greening" measures are expected as well as redistribution of budget funds in a manner which will provide for uniform regional development. Measures of second column of Mutual Agricultural Policy should be directed to the increase of competitiveness, innovation and much more than now response to the challenges connected to the preservation of environment and climate changes. The following strategic goals of Mutual Agricultural Policy after 2013 are imposed as necessary (EC, 2010b):

- safe procurement of EU markets with food;
- production of healthy safe food with respect of ecological principles; and

- employment growth and preservation of human environment in rural areas of the EU.

Pursuant to the above-mentioned goals future Mutual Agricultural Policy should be sustainable, more simple and efficient. Such policy should provide for uniform development of all regions and higher level of respect for needs and expectation of EU citizens.

The above mentioned alterations of Mutual Agricultural Policy should also be because of increased demands of taxpayers for more efficient utilization of budget funds. European Committee propose for the period from 2014 until 2020, the distribution of EUR 281.8 billion for the first, and EUR 89.9 billion for the second column of Mutual Agricultural Policy. Moreover, the supplement of EUR 15.2 billion is projected for the special purposes (EC, 2011).

Higher efficiency level of Mutual Agricultural Policy in the period after 2013 will be provided for by introduction of new monitoring and evaluation system. Starting from Brussels Conference in 2011, until this date, the discussions on preparation of basis for implementation of supervision system for realization of measures included to the first and second column of Mutual Agricultural Policy were carried out on several occasions. Thereby, in the course of this system implementation the idea is to include to the process of monitoring and evaluation, besides the institutions, the farmers and all other relevant participants in rural regions.

Key changes in Mutual Agricultural Policy after 2013 are the following:

- reduction of risks at the support level between the old and the new members,
- establishment of Single Farm Payment in all member countries until 2028,
- reduction of support to farmers who receive more than EUR 150.000 from European budget (reductions are scheduled from 2014, and that 20% for the amounts of EUR 150.000 to 200.000, 40% for the amounts of EUR 200.000 to 250.000, and 70% for amounts of EUR 250.000 to 300.000),
- 30% of support will be conditioned by ecology care,
- Up to 30th September 2015, the current system of limitation for sugar production will become null and void,
- Higher subventions for young farmers.

A growth of demand for agricultural-food products is expected in the following decades in the world market. On the other hand, the consumers in the European Union are changing their preferences and growingly opt for high quality food products, and demand a broader range of products that allows choice. Considering that the European Union is one of the leading food exports in the world market and that the agricultural sector is a significant segment of the European economy, the reform of the agricultural policy should enable strengthening of agriculture and raising its level of competitiveness.

The promotion of energy efficiency, preservation of land quality, production of biomass and renewable sources of energy, in other words promotion of innovations, should

enable the new Common Agricultural Policy of the European Union to stimulate positive, and reduce the negative impacts on the environment by agriculture.

The fact that agriculture is a predominant activity in rural areas of the European Union imposes the need to provide room in the scope of activities of the Common Agricultural Policy that will motivate young people directly economically to remain in the rural areas. Considering that people are the key potential of any, accordingly also the rural development, emphasis is placed on the importance of strengthening the human capital in rural environments. Providing incentive to young farmers to remain in the village has a direct positive effect on realizing a balanced territorial development, namely, reducing the difference between the rural and urban areas of the European Union. In that context the European Committee propose for the future reconstruction of Mutual Agricultural Policy to implement, starting from 2014 the system where the subvention amount for farmers under age of 40 will be higher for 25% compared to subventions for older farmers. For the commencement of new activity or structural changes of existing activity, the Committee for young farmers created multi form support: staring from subsidized interest rate and bonus for investments, up to grace period for standard implementation.

New concept of Common Agricultural Policy

The new concept of the Common Agricultural Policy was the subject of public debate held on April 12 until June 11, 2010. The respondents were divided into three groups: the general public, namely, the citizens of the European Union, institutions and experts. In addition to the subject participants, the European Network for Rural Development took an active part in the debate. Considering that the year 2013 is considered the turning point in the history of the Common Agricultural Policy, the public debate searched for the answers to several main questions (EC, 2010a):

- Why does the European Union need a Common Agricultural Policy;
- What are the society's objectives from Common Agricultural Policy;
- Why should the Common Agricultural Policy be reformed; and
- What tools are needed for the new Common Agricultural Policy.

Why does the European Union need the Common Agricultural Policy – the majority of respondents in the debate agreed that the previous reforms oriented the Common Agricultural Policy in a good direction. The representatives of the general public particularly pointed out the need to do more, so that this common policy would provide equality to all participants in the food chain, from the producer to the consumer. Furthermore, the need was emphasized to create equality, both for the producers, as well as the consumers in all member countries. The respondents from all three groups agreed that the future Common Agricultural Policy should achieve diversification of the farming system across Europe, particularly in less developed areas.

What do citizens expect from the Common Agricultural Policy – all the respondents in the public debate agreed that the purpose of existence of a Common Agricultural Policy lies in providing:

- safe, healthy food choice at affordable prices;
- sustainable use of the land;
- sustainable rural development; and
- security of supply to the European Union market.

A significant number of respondents emphasized the role of the Common Agricultural Policy in resolving the issue of unemployment in certain rural areas of the European Union. Furthermore, the significance of production of high quality food at affordable prices for the consumer was also stressed.

Why the Common Agricultural Policy should be reformed – the participants in the debate agreed that the future reforms must be carried out because of:

- preventing instability in the food market;
- the need to address the increasing global demand;
- restructuring the payment system and simplifying administrative procedures;
- the need to stress the importance of some non-market items, such as environment, quality and health standards and sustainability in the Common Agricultural Policy;
- adequate response to the effects of climate change;
- strengthening the competitiveness of European agriculture;
- ensuring better coordination with other policies of the European Union in order to provide rural development.

In this segment of public debate, in addition to the above reasons for the reform of the Common Agricultural Policy, some other, not less important issues surfaced issues that require the reform of this policy. These are, first of all, inequality in the implementation of measures of Common Agricultural Policy, as well as problems in functioning of the production chain and supply of the market with food in all twenty-seven member countries of the Union. The several decades' long issue of lack of equity in the economic position of small and large farmers caused a heated debate between the producers. The need was particularly pointed out to reduce the negative impact by the future reform of the Common Agricultural Policy on the position of the developing countries in the world food market.

What tools are needed by the Common Agricultural Policy in the future – the opinions on the instruments of the Common Agricultural Policy were divided within the debate. Namely, on one side the respondents argued that the former system of support of agricultural need not be changed radically, whereas opinion was heard from the other side of the need to introduce only a system of payments that will depend on upholding the principle of sustainable development of agriculture, namely, rational use of natural resources. Nevertheless, the respondents agreed on the issue which instruments would preferably be used in the future. As most important instruments of the new Common Agricultural Policy were pointed out: instruments for market

stabilization, programs of education, strategies of local economic development, strengthening of producers associations.

Although the public debate raised a great number of questions on the future of the Common Agricultural Policy ranging from climate changes and preservation of biodiversity to the new model of payment and impact on the world market, it is, nevertheless, possible to systematize the conclusions of the debate to a certain extent. Namely, the future of the Common Agricultural Policy of the European Union should be marked by the following priorities:

- total, not partial (and formal) reforms with strengthening of cooperation with other common, both internal as well as external European policies;
- ensuring food security of the Union;
- continue to strengthen the competitiveness of the European agriculture through innovations and promotion of research;
- transform market intervention into a modern crisis management tool;
- preserve biodiversity;
- sustainable rural development;
- redefine the structure of two support pillars of the Common Agricultural Policy and clarify their relationship;
- provide adequate resources for financing rural development;
- implement fairer measures in order to enable fairer position to small farmers, less developed regions and new Union members;
- create fair competition conditions between the domestic and imported products;
- avoid discrimination of developing countries in the world market and contribute in the fight against hunger and poverty.

After the discussion in the European Parliament and the European Council, passing of the regulations and documents is expected by the end of 2013. The new reform of the Common Agricultural Policy based on defined rules will begin to be implemented from January 1, 2014.

Conclusion

The Common Agricultural Policy of the European Union is one of the most integrated, albeit not the most expensive European common policy. Considering the extremely high budget costs it is producing, financing of the agricultural policy of the European Union is one of the key issued related to the functioning and reforms of this policy. The fact that the critical position regarding the "cosmetic" character of the former reforms of the Common Agricultural Policy is actually a correct position may also be confirmed by looking at the structure of the European Union budget. Namely, in spite of the tendency of reduction of budget costs for the domain of agriculture and rural development, the Union allocated 42% of its budget for these needs in 2011. Furthermore, the draft of the European budget for 2012 foresees allocation of 40.8% for the same purpose.

During the half century of existence, the Common Agricultural Policy of the European Union was reformed on several occasions. The purpose and the essence of the reform interventions was harmonized, first of all, with the requirements of the Union, its consumers and farmers, but also with the demands set before the Union by the World Trade Organization. The long road from the Common Agricultural Policy (CAP) to the Common Agricultural and Rural Policy of Europe (CARPE) embodied in the MacSharry Reform and Agenda 2000 marked the first decades of its existence. In the past ten years, starting from Fischler Reform to the latest public debates on its future, the European agricultural policy is faced with new challenges. In accordance with the current strategic goals of the European Union it should become "greener, more equitable and efficient". In line with the goals of development strategy of the European Union by 2020 the Common Agricultural Policy during the subject period, should reform so as to provide a sustainable economic and environmental development of agriculture and balanced rural development in all regions of the Union.

The agricultural policy of the European Union until 2014 and its recent reforms is created so as to ensure a production of safe and healthy food with economic strengthening of rural areas and care for environmental protection. Furthermore, the reduction of the budget expenses for agriculture and rural development is the main characteristic of the Common Agricultural Policy during the period 2007 until 2013. The status of the candidate country for EU membership and negotiations awaiting Serbia impose the need to harmonize the national agricultural policy with the Common Agricultural Policy of the European Union. The actual differences between the current agricultural policy of Serbia and the Common Agricultural Policy of the European Union will make the process of adjustment and harmonization extremely complex. In view of the fact that the process of evolution of the Common Agricultural Policy of the European Union is continuous and that reforms will ensue in the following years, the entities participating in creating the agricultural policy of Serbia should be acquainted fully with the trends of development of the European agricultural policy and make adequate efforts for maximum adjustment of our agricultural policy with the development trends.

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DOSADAŠNJE I BUDUĆE REFORME ZAJEDNIČKE AGRARNE POLITIKE EVROPSKE UNIJE

Katarina Marković, Zoran Njegovan, Radovan Pejanović[2]

Rezime

Ove godine Evropska unija obeležava pedeset godina postojanja Zajedničke agrarne politike. Od 1962. godine do danas ova politika je reformisana shodno okolnostima unutar Unije i različitim uticajima sa međunarodnog tržišta. Sama činjenica da je od svog osnivanja do danas Evropska unija od zajednice šest država prerasla u zajednicu dvadesetsedam država dovoljna je da opravda brojne reformske zahvate u okviru Zajedničke agrarne politike. Cilj ovog rada je da analizira dosadašnji tok razvoja ove najintegrisanije politike Evropske unije, kao i predloge za njeno buduće reformisanje. S obzirom na dobijanje kandidature za članstvo i predstojeću konkretizaciju pregovora Republike Srbije sa Evropskom unijom u svim, pa i u segmentu poljoprivrede, autori ovog rada smatraju kao važno sagledavanje aktuelnih promena u evropskoj poljoprivrednoj politici.

Ključne reči: *Evropska unija, Zajednička agrarna politika, refome, subvencije*

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AGRICULTURAL DEVELOPMENT OF NIŠ DEPENDENT UPON SECURE ENERGY SUPPLY

Jelena Petrović[1], Žarko Dimitrijević[2]

Summary

In order to achieve energy stability and sustainable development, it is necessary to secure the energy supply and improve efficiency of energy production and consumption at all levels. The increase of energy production from renewable sources will help deliver secure supply and can be one of the most attractive areas for foreign investment in the territory of Niš. Biomass, which is considered to be the greatest potential renewable source of energy in the city of Nis, has insufficiently been utilised. The authors of the paper highlight the importance of using biomass and consider the issues which arise from substituting conventional energies, such as securing the safety of energy supply, enhanced agricultural development and environment protection.

Key words: *agriculture, supply security, energy, renewable sources of energy (RSE).*

JEL: *K32, Q2*

Introduction

The trend towards replacing conventional sources of energy with renewable ones has improved the position and importance of agriculture in the overall economic development of Serbia. Agricultural production is important for two reasons it contributes to the overall economy delivering a positive social outcome through its contribution to total employment and it is a fundamental pre-requisite for the development of renewable energy. The current development of agriculture in almost all the parts of Serbia is characterized by two facts: the first is that agriculture is declining in gross domestic product as it is being replaced by other economic activities; the second is a consequence of this trend and of the modernization of the production process. Together they result in an absolute and relative reduction of employment and the agriculturally active population. For the improvement of agricultural production,

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the most important is to keep levels of population and agricultural areas as the two main resources.[3]

The fulfilment of all the conditions for agricultural development in the Republic of Serbia and especially in the city of Nis (developed biodiversity with adequate climatic conditions, adequate operating assets, educated and skilled personnel, favourable conditions for scientific method application in practice, etc.) will generate a renewed approach to agricultural production delivering a greater food supply to meet the population's needs and will support the development of biomass as the basic renewable source of energy.

In the city of Nis, biomass is used sporadically and in a traditional way as energy for heating, cooking or water heating. However, by raising agricultural production to a significant level coupled with new investments, biomass can be used in large co-generation plants for electricity and heating energy production and it can serve as a raw material for bio-fuel production. This will result in increased employment rates, social product growth, reduced consumption of fuel from conventional sources of energy and reduced pollution and preservation of the environment.

Nis agricultural production

The city of Nis with about 258,000 citizens is the third largest city in Serbia.[4] Once an industrial and economic centre of the region, it today shares the fate of most cities with similar structure of economy and population in Serbia, namely uncompetitive exports, outdated technology and low productivity.[5] These factors have also affected the development of agriculture.

Table 1. Structure of agricultural land in the city of Nis (in %)

Year	Fields and gardens	Orchards	Vineyards	Meadows	Grasslands
1996	58.97	5.29	11.01	5.49	19.22
1999	58.44	5.25	10.99	5.46	19.86
2000	57.87	5.25	10.88	5.80	20.20
2004	58.65	5.34	10.51	5.05	20.45
2008	56.16	5.07	8.90	5.12	24.74
2009	56.60	4.91	8.79	5.13	24.57

Source: Odsek za statistiku (2006, 2010), Statistički godišnjak grada Niša, Poljoprivreda, šumarstvo i vodoprivreda, Niš.

3 Rajić, Z., Davidov, R., Dimitrijević, B., Mišić, I. (2006): *Upravljanje resursima u kontekstu razvoja poljoprivrede.* Ekonomika poljoprivrede, IEP Beograd, 53(4), pp. 1023-1024.

4 Republički zavod za statistiku (2011*), Popis stanovništva, domaćinstava i stanova u Republici Srbiji,* Ukupno popisana lica, ukupan broj stanovnika prema Popisima 2011 i 2002 i ukupan broj domaćinstava i stanova, Beograd.

5 Gligorijević, Ž., Petrović, J. (2008): *Održivi razvoj turizma na teritoriji grada Niša,* Ekonomika, Društvo ekonomista „Ekonomika", 58 (5-6), Niš, pp. 58.

The city of Niš represents the socio-economically most developed area of southeast Serbia. According to its location and topography, soil and hydrographical characteristics, the city has significant potentials and conditions for the development of agricultural production. The largest uninhabited part of the territory consists of very fertile agricultural land. However, taking into the account the materials that include the term "biomass"[6] (in the context of renewable energy sources) there is a need to adapt the sown species i.e. planted areas.

Data from the table below indicates that the structure of agricultural land in the city of Nis is dominated by fields and gardens. In the observed period, the area covered with fields and gardens was reduced by 2.37%, vineyards by 2.22%, orchards by 0.38%, meadows by 0.36%, while the area covered with grassland expanded by 5.35%. This trend adversely impacts on the potential use of renewable sources of energy and the development of the energy sector in the city.

Although fields are traditionally planted with maize and wheat as the main crops, the production level is not constant (Table 2). The values presented in the table show large annual fluctuations. Thus, total wheat production ranges from 8,000 to 20,000 tonnes, and maize production ranges from 10,000 to 31,000 tonnes. Yields of wheat and corn are below the average yield obtained in Serbia as the result of factors such as field fragmentation, insufficient soil irrigation, growing corn and other vegetables on the same land, outdated machinery, ageing agricultural workforce, poor agricultural policy, etc.[7]

Table 2. Wheat and corn yield in the city of Nis

Year	Total cereal production (in t)	The average yield of wheat on family farms (in kg)	The total production of corn (in t)	The average yield for corn on family farms (in kg)
1996	8,581	2,086	9,737	1,371
1999	16,401	3,089	23,208	3,672
2000	10,395	2,061	9,548	1,471
2004	19,464	3,743	27,459	4,400
2008	15,870	3,777	26,271	4,122
2009	12,238	2,933	26,935	4,295

Source: Odsek za statistiku, (2006, 2010), Statistički godišnjak grada Niša, Poljoprivreda, šumarstvo i vodoprivreda, Niš.

In the past, viticulture represented a significant share of agriculture with about 5,000 acres of vineyards and 3,500 of installed capacities in the four wineries. The wineries closed between 2001 and 2003 as the result of the termination of grape purchase and the occurrence of phytoplasma in vines, consequently the vineyard area in Nis was decreased.

Viticulture and fruit production are faced with numerous problems. The highest recorded number of vines was noted in 1971 and since then it started decreasing, so that in 2009 it

6 Infra, 3.

7 Đekić, S. (2001): *Agrarni menadžment,* Europrint, Niš, pp. 46.

totalled only 20,446. However, grape production was not significantly reduced until 2002, because the yield per vine was 1kg. One exception is low yield achieved in 1999 (Table 3).

Table 3. Viticulture and fruit production in Nis

Year	Vineyards		Apples		Plums	
	Number of fertile vines (1000 pieces)	The yield (in t)	Number of productive trees	The yield (in t)	Number of productive trees	The yield (in t)
1996	26,727	22,554	219,770	4,024	648,477	9,104
1999	25,599	4,730	198,490	2,429	611,950	4,324
2000	25,416	22,049	190,890	2,754	600,758	5,944
2004	24,031	19,442	175,920	2,363	522,915	5,825
2008	20,406	14,325	167,330	1,905	468,820	4,200
2009	20,446	15,794	159,740	2,525	441,010	4,930

Source: Odsek za statistiku (2006, 2010), Statistički godišnjak grada Niša, Poljoprivreda, šumarstvo i vodoprivreda, Niš.

Fruit production is outdated, uncompetitive and not cost effective. Factors that negatively affect the quantity and quality of fruit are:

1) Small and fragmented planted areas,
2) Old planted areas,
3) Limited production of seedlings in the city,
4) The quantity of fruit production depends on climatic conditions,
5) Lack of investment,
6) Inadequate policies in the area of subventions,
7) Lack of modern facilities for processing and packaging.

Nis has very favorable conditions for the development and further improvement of fruit production. Exploitation of given conditions implies creation of a favorable environment for the rapid recovery of agriculture and the economy.[8]

The city of Nis has potential for far greater agricultural production. A significant part of the area is not used for growing crops. The observed part of the area also has good potential for the expansion of crop production. In addition, agricultural production can be expanded to arable land by applying modern technology. Nis is behind other areas and other countries in its use of modern technology in agriculture.

8 Vukoje, V., Milić, D. (2009): *Ekonomski efekti u proizvodnji važnijih vrsti voćaka,* Ekonomika poljoprivrede, Institut za ekonomiku poljoprivrede, 56(3), Beograd, pp.377-387.

Agricultural production and security of energy supply

The availability of a secure energy supply is of strategic importance. Substitution of conventional fuels (coal, gas, oil and oil products) by synthetic raw materials often relies on the provision of other raw materials for the production of substitutes, which are also difficult to obtain. Thus, states often become dependent upon the countries rich in mineral wealth, especially in energy resources such as oil.[9]

Table 4. Dependence of the Republic of Serbia[10] on imported primary energy sources (in %)

Element	2008.	2009.	2010.
Oil and derivatives	85.80	83.77	78.19
Gas	88.54	85.77	83.56
Coal	11.36	8.44	9.58

Source: Republički zavod za statistiku (2008, 2009, 2010), Ukupni energetski bilans Republike Srbije, Beograd.

Reducing dependence can be achieved by reducing consumption and increasing production itself. The basic requirement to reduce consumption is to raise the level of energy efficiency. Potentials of energy savings by raising energy efficiency vary with respect to the observed sectors.

Table 5. The possibility of energy saving by sector

Sector	The potential savings (in %)
Transport	10
Habitation	10-35
The public sector	35-40
The service sector	10-30
Industry	5-25

Source: WBIF, Executive Summary, Financial Support Facilities Available for Energy Efficiency and Renewable Energy in the Western Balkans, November 30, 2011. Available at: http://www.energy-community.org/portal/page/portal/ENC_HOME/DOCUMENTS?library.category=165

The greatest energy savings can be achieved in the housing sector and public sector. The new Law on planning and building[11] has systematically solved the problem of energy efficiency in housing, but only for newly constructed buildings i.e. reconstructed buildings. Namely, the Regulations on Energy Efficiency in Buildings[12] have established energy performance

9 Mrdaković, C., Mihajlović, D. (2008): *Upravljanje energetskim resursima Srbije i spoljnotrgovinska razmena sa Rusijom*, Međunarodni problemi, Institut za međunarodnu politiku i privredu, 60 (4), Beograd, pp. 542.

10 According to the census from 2011 year, 5.24% of the total population of Serbia lives on the territory of Nis.

11 Sl. glasnik RS, br. 72/2009, 81/2009 - ispr., 64/2010 - odluka US i 24/2011.

12 Sl. glasnik RS, br. 61/2011.

of residential buildings which are aimed at increasing energy efficiency i.e. decreasing energy consumption. However there are no equivalent solutions for the public sector or for other sectors. This is considered to be the key to achieving major cost savings (Table 5).

Reducing dependence of the State upon imported energy is possible by increasing its own production, which, when it comes to Serbia, can be done in two ways. The first involves new investments in the production of fossil fuels (coal and oil), which is of very limited nature due to restricted and insufficient resources. Another option is based on investment into projects aimed at obtaining renewable sources of energy. The most effective investment in terms of ensuring security of supply and environmental protection is to invest in agricultural production in order to obtain biomass. In accordance with the Decision on Establishing the Energy Development Strategy of the Republic of Serbia[13], increasing production using renewable sources of energy refers primarily to biomass, hydro potentials of small water flow (with facilities up to 10 MW), geothermal energy, wind energy and solar radiation. The Decision states that the circumstances in Serbia require so-called decentralized production of heat (through combustion of biomass and "collection" of solar radiation) and electricity (by building mini hydroelectric power plants with the power of 10 MW and wind generators of up to 1 MW) to meet the needs of local consumers (villages, cities) and to supply surplus electricity to networks across Serbia. The energy potential of these renewable energy sources is very important and is over 3 M t.en.[14]a year (with the potential of small hydroelectric power plants of about 0.4 M t.en). About 80% of the total potential is in the utilization of biomass, about 1.0 M t.en of which is comprised of wood biomass (wood cutting and timber residue in its primary and/or industrial processing), and more than 1.5 M t.en. of agricultural biomass (agricultural and farming residues including slurry) - with 50% greater potential than the one of wood biomass.

To achieve better utilization of agricultural biomass it is necessary to establish incentives to promote the introduction of modern technologies for biomass and waste combustion, to invest in new facilities and to purchase equipment for the use of renewable sources of energy. It is also important to raise public awareness of the possibility of using renewable energy sources and about the benefits provided by the International Fund for Implementation of Specific Projects. This includes greater involvement of local authorities by showing the positive impact of these activities on employment and development of the local infrastructure.

The city of Nis has already established a Council on Energy Efficiency[15] which aims to manage energy in a more rational way, to reduce the share of fossil fuels in favour of renewable sources of energy, to decrease emissions of green house gases in order to preserve the environment, and, as its basic task, to promote the use of renewable sources of energy, with agricultural biomass representing the greatest overall potential.

13 Sl. glasnik RS, br. 44/2005.

14 Millions tones of oil equivalent.

15 Rešenje o obrazovanju Saveta grada Niša za energetsku efikasnost (Sl. list grada Niša, br. 22/2011).

Biomass as the engine of agricultural production development

Increased agricultural activity in the Nis area would create the conditions which would allow biomass to become a major source of energy. There is no exact economic data about the current feasibility of biomass use but by applying established principles we can conclude that greater available amounts would create favourable conditions for investment in great power plants which would be able to meet most energy needs on the whole territory of the city and beyond.

Table 6. Biomass as a renewable source of energy

Includes:	**Does not include:**
plants and parts of plant	fossil fuels and secondary and by-products produced thereof
energy sources derived from plants or parts of plants, whose entire components and intermediate products were generated from biomass	peat
waste and by-products of plant or animal origin from the agricultural, forestry or fishing industry	mixed municipal waste from private households and similar waste from other origins including biomass fractions derived from mixed municipal waste
Bio-waste	waste wood with the exception of industrial residual wood
gas produced from biomass through gasification or pyrolysis and its secondary and by-products	paper, cardboard
alcohols produced from biomass, whose components, intermediate, secondary and by-products were generated from biomass.	sewage sludge within the meaning of the Sewage Sludge Ordinance (Klärschlammverordnung)
	harbour mud and other water body sludge and sediments
	textiles
	landfill gas
	sewage treatment gas

Source: Ordinance on the Generation of Electricity from Biomass (Biomass Ordinance – Biomasse V), Federal Ministry for the Environment, Nature Conservation and Nuclear Safety of Germany, December, 2011, available at: http://www.bmu.de/english/renewable_energy/downloads/doc/5433.php

The potential of biomass in the city of Nis is large. The basis for this statement is derived from the definition of biomass itself. Biomass is a biodegradable fraction of products, waste and residues in agriculture (including vegetable and animal substances), forestry and associated industries, as well as a biodegradable fraction of industrial and city waste.[16] The Energy Law

16 Directive 2001/77/EC of the European Parliament and of the Council of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity market.

of the Republic of Serbia defines biomass as[17]: ''a biodegradable part of products, waste and residues of biological origin in agriculture (including vegetable and animal substances), forestry and associated industries, as well as a biodegradable part of industrial and communal waste", the contents of which were expanded on the basis of the Decision on adoption of the biomass action plan from 2010 to 2012[18] which states: ''Biomass is a biodegradable matter originating in agriculture, forestry and associated industries and households, which includes: plants and plant parts, plant residues and by-products in agriculture (straw, corn, branches, seeds and nuts), residues of animal origin in agriculture (manure), the remains of plants in forestry (logging residue), biodegradable residues in food and timber industry which do not contain hazardous substances and separated biodegradable fraction of communal waste". Finally, biomass is defined in overseas publications as a renewable source of energy which is comprised of matter composed of plants and plant parts, residues and by-products of plant and animal origin in agriculture, forestry, and commercial production of fish, biological waste, as well as gas and alcohol produced by chemical processes from biomass (Table 6).

From these definitions and the data on biodiversity in the territory of the city, we can conclude that possible increase in production would not have adverse effects on the production of traditionally grown crops, indeed it would be just the opposite. Therefore, it is necessary to extend the existing agricultural production and make it more effective, resulting in larger quantities of matter that can be considered as biomass.

Table 7. Biomass of targeted agricultural crops and equivalent oil value (t/year)

No	Culture	Area (in ha)	Yield (t/ha)	The total biomass (in t)	The equivalent value oil (t/year)
1	Wheat	4,167	2.94	12,250.98	4,083.65
2	Rye	38	2.07	94.39	31.46
3	Barley	568	2.77	1,575.06	525.02
4	Oats	355	2.12	752.25	250.75
5	Corn	6,265	4.30	32,327.40	10,775.78
6	Branches from the orchard	1,905		2,000.25	800.10
7	Grape-vine	3,408		3,237.60	1,295.04
	In total			52,237.93	17,761.80

Source: Authors' calculations based on the data from Odsek za statistiku (2010), Statistički godišnjak grada Niša, Poljoprivreda, šumarstvo i vodoprivreda, Niš.

17 Član 2. stav 1. tačka 3. Zakona o energetici (Sl. glasnik RS, br. 57/2011 i 80/2011 - ispr).

18 Sl. glasnik RS, br. 56/2010.

Apart from the expansion of the existing production, it is also possible to increase agricultural production through ‘’special purpose plantations’’[19]. This involves planting special types of fast growing trees (willow, various types of cane) which are used specifically for the production of biomass matters. This approach is technologically possible and has been achieved in many developed countries, particularly Great Britain[20].

Furthermore, it is considered that the concept of special purpose plantations could include targeted crops which would provide greater benefit than the plantations cultivating types of longer vegetative development. First, the available field would not be exclusively used for the production of biomass, but would also be used for agricultural products which can be offered on the market. Second, by increasing the production of targeted crops, conditions for the upgrade of other industries, especially manufacturing, would be created. Third, employment among agricultural workers would be more regular because of the requirement to grow crops with a shorter vegetation period. Fourth, by growing targeted plants, biodiversity would be much higher.

Table 7 shows current production of targeted agricultural crops in the city of Nis and the equivalent oil value. Based on the energy value of biomass of certain crops, total equivalent oil value is 17,761 tonnes per year. If the production of all crops was increased up to the volume of production which was realised during the nineties in the last century, overall biomass and the equivalent oil value would be about 1.5 times higher.

Table 8. Estimation of total biogas production in the city of Nis

Types of livestock	The number of heads of cattle[1]	Excrement[2] (kg/day)	The total dry matter (kg/day)	Organic matter (kg/ day)	The amount of biogas (Nm^3)
Cattle	3,330	122,328	15,492.6	12,565.8	4,028.07
Pigs	934	20,548	2,521.8	2,521.8	756.54
Poultry	290	7,540	2,291.0	1,682.0	580.00
In total	4,554	150,416	20,305.4	16,769.6	5,364.62

Source: Calculations based on the data from Odsek za statistiku (2010). Statistički godišnjak grada Niša.Poljoprivreda, šumarstvo i vodoprivreda, Niš.

The situation is similar with the production of biogas. Table 8 shows estimates of energy potential of biogas, first of all by taking into consideration the state of cattle, pigs and poultry which was achieved in 2007. Total heat equivalent obtained from the manure is equal to about 120,704 MJ / day. The stated potential would not greatly affect the energy balance, but it would contribute significantly to reducing environmental hazards.

19 Nacionalna strategija za uključivanje Republike Srbije u mehanizam čistog razvoja Kjoto protokola za sektore upravljanja otpadom, poljoprivrede i šumarstva, (Sl. glasnik RS, br. 8/2010), pp. 31.

20 Royal Commission on Environmental Pollution (2004), *Biomass as a Renewable Source*, Biomass Fuels, London, 2004.

Manure can also be used as fodder, for production of earthworms, humus and biogas as well as protein feed by using microorganisms. None of these possibilities have been used sufficiently, so the problem with slurry still exists and it puts livestock production in danger and makes it more expensive.[21]

It is therefore not surprising that farming in Nis is significantly declining (Table 9). In the period from 1960 to 1975, the number of cattle was increased, with the index of 120.8 for the year 1975 when compared to the year 1969. In the period from 1975 to 2007 the number of cattle was reduced, with the index of 34.2 for the year 2007.

Breeding pigs and producing corn both have an important role in supplying the population with meat and meat products. When it comes to pig production it should be noted that changing breed and the transition from fat to meat are important factors. Development of the observed production depends on the development of the slaughter industry. This is dependent upon revitalization of the existing plant, construction of new plants and a growth in the volume of production, i.e. that the decrease of the number of bred pigs is stopped. The index in 2007 was only 24.8.

Table 9. Number of cattle, pigs, sheep and poultry

Year	Cattle		Pigs		Sheep		Poultry	
	Total	Index	Total	Index	Total	Index	Total	Index
1961	10,681	100.0	13,767	100.0	28,880	100.0	102,857	100.0
1965	11,379	106.5	17,576	127.7	23,703	82.1	126,701	123.2
1971	11,184	104.7	20,285	147.3	13,574	47.0	165,496	160.9
1975	12,899	120.8	22,386	163.0	15,900	55.1	242,756	236.0
1991	8,994	85.0	25,357	185.0	10,333	35.6	157,786	154.0
2001	7,636	71.5	17,981	130.6	14,376	49.8	171,339	166.6
2004	6,951	65.1	15,112	109.7	4,310	14.9	109,062	106.0
2007	3,653	34.2	3,416	24.8	4,451	15.4	93,088	90.5

Source: Odsek za statistiku (2010). Statistički godišnjak grada Niša.Poljoprivreda, šumarstvo i vodoprivreda, Niš.

Sheep farming on the territory of Nis is also in an unfavourable position. The number of sheep in 1961 was 28,880, this decreased to 15,900 in 1975 and by 2007 it was only 4,451. The number of female breeding stock and the number of animals per 100 ha of arable land changed alongside with the fluctuation of the overall number of sheep.

Although the highest level of modern technology in livestock production in Nis was achieved in the poultry production, the period from 2000 to 2007 was characterized by a significant decrease in production compared to the previous period. The development of this production was influenced by changes in modern technology and industrial production of poultry and eggs, however an important element which would improve the sustainability

21 Brkić, M. (1993): *Proizvodnja i korišćenje biogasa i biođubriva iz stajnjaka,* Institut za poljoprivrednu tehniku, Poljoprivredni fakultet, Novi Sad, pp. 5-11.

of production was left out thus reducing the overall rate of return. In poultry production the cycle is not long, and with the help of incubators much more meat can be produced than with conventional breeding.[22] If we add income from biomass production, economic sustainability would be viewed in a different way.

Sustainability of agricultural production

The link between agricultural production and energy independence is of a permanent character. The greater agricultural production, the greater the amount of available biomass there is, which in turn improves the conditions for increased energy production and reduced energy dependency. However, for project realisation it is necessary to fulfil two conditions.

First, it is necessary to create a favourable investment atmosphere for investing into facilities for renewable energy. This primarily involves the adoption of new regulations in accordance with the EU whose solutions would help abolish general and specific legal and administrative barriers to exploiting new energy facilities. Regulations which relate to the facility construction in which production of energy would be carried out are considered as general because they are covered by general regulations, common for building other types of facilities. To include energy plant into the existing energy infrastructure in the country, an investor is obliged to fulfil several conditions and to obtain certain approvals and permits apart from procuring necessary equipment and facilities. We consider the complicated and often imprecise procedures for obtaining necessary approvals and permits from the relevant public services (at national or local community level) as particular barriers.[23]

Legal and administrative barriers of special character could be useful to support pure development techniques which ensures agricultural development based on biomass use providing this guarantees the sustainability of development and also meets the second condition, i.e. realization of interdependence of agriculture production and energy stability.

The application of the pure development mechanism protects agricultural land from negligence and abuse of exploitation and at the same time it guarantees the sustainability of agricultural production and application of all environmental protection standards. Pure development mechanism is based on the use of two concepts: "carbon neutrality" and "renewable biomass".[24]The concept of "carbon neutrality" means that the CO2 emissions generated in the process of biomass combustion do not exceed naturally-generated levels, ie .the amount of CO2 released in the process of biomass combustion is equal to the amount

22 Đekić, S. (2001): *Agrarni menadžment*, Europrint, Niš, pp. 66.

23 Dimitrijević, Ž., Ivanović, Đ. M. (2011): *Revoking of legal and administrative barriers for using renewable energy sources in order to increase competitiveness of companies in Serbia,* Proceedings - 16th International Conference of the Series Man and Working Environment Safety of Technical Systems in Living and Working Environment - [STS-11], Univerzitet u Nišu, Fakultet zaštite na radu, Niš, pp. 490

24 Nacionalna strategija za uključivanje Republike Srbije u mehanizam čistog razvoja Kjoto protokola za sektore upravljanja otpadom, poljoprivrede i šumarstva (Sl. glasnik RS, br. 8/2010), pp. 28.

of CO2 used by plants in their growth and development process. Thus, the CO2 released in the biomass combustion process is a part of the natural cycle and biomass is considered to be carbon neutral (because it does not release additional CO2). In this respect, biomass as an energy source is similar to renewable energy sources such as water, wind or solar energy.

The concept of "renewable biomass" relates to the standards of land treatment which generates biomass matter. It is necessary to ensure that after the collection of matter on the treated land the level of carbon is not increased, i.e. the conditions for the emergence of new material are created.

Conclusion

Reducing dependence of the country upon imported energy is also possible by raising its own production, which can be done in two ways when it comes to Serbia. The first involves new investments in the production of fossil fuels (coal and oil), which is of a very limited nature due to insufficient resources. An alternative is investment into projects for obtaining renewable sources of energy. The most promising investment in terms of ensuring security of supply and environmental protection is to invest in agricultural production in order to obtain biomass.

The city of Nis is rich in resources for the development of agricultural production and obtaining agricultural biomass. Increased agricultural activity in the city would provide conditions for biomass to represent a major source of energy. However, for the realisation of the project in such an established interdependence, it is necessary to fulfil two correlative conditions.

First, it is necessary to create a favourable investment atmosphere for investing into facilities for renewable energy, and then ensure the sustainability of agricultural production based on the principle of biomass through a pure development mechanism – by applying the concept of "carbon neutrality" and "renewable biomass". The application of the pure development mechanism protects agricultural land from negligence and exploitation and at the same time it guarantees the sustainability of agricultural production and application of all environmental protection standards.

Increasing agricultural production in the Nis area would increase biomass matter and create the conditions for the production of larger quantities of energy. The production of larger amounts of energy would mean less energy dependence of the city of Nis, and it would also lay the foundation for the application of that pattern to other parts of Serbia.

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SIGURNOST SNABDEVANJA ENERGENTIMA U FUNKCIJI RAZVOJA POLJOPRIVREDE GRADA NIŠA

Jelena Petrović[25], Žarko Dimitrijević[26]

Rezime

Za ostvarivanje energetske stabilnosti jedne države i njen održivi i ravnomerni razvoj neophodno je obezbediti sigurnost snabdevanja energentima i unaprediti energetsku efikasnost proizvodnje i potrošnje na svim nivoima. Povećanje proizvodnje energije iz obnovljivih izvora u cilju obezbeđenja sigurnosti snabdevanja može biti jedna od najatraktivnijih oblasti za strana ulaganja na teritoriji grada Niša. Biomasa, kao najveći potencijalni obnovljivi izvor energije u gradu Nišu, nedovoljno je iskorišćen. Autori u radu ukazuju na značaj korišćenja biomase, koji se prvenstveno ogleda u obezbeđivanju sigurnosti snabdevanja energentima, ubrzanom razvoju poljoprivrede i zaštiti životne sredine supstitucijom konvencionalnih energenata.

Ključne reči: *poljoprivreda, sigurnost snabdevanja, energija, OIE.*

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Review Article

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AGRICULTURAL PRODUCTION, OCCUPATION AND A WAY OF LIFE

Sveto Purić[1], Jelena Purić[2], Anja Savić Gligić[3]

Summary

If you want the best for agriculture, you cannot separate agriculture as a business and agriculture as a way of life. If you do separate them, the question is what will remain from either of the two. If you do not connect them, national food stability is jeopardized, but the question of safety is seriously entered.

Good experiences of others are useful and good, one's own are more useful and better. The food cultivated on the living and working territory of a man suits him the best. The other one, besides the high prices, is the necessary evil. With that, it burdens the balance of payments, instead of surplus, it makes the deficit. Moreover, it does not feel good. Finally, where is the pleasure of occupation in agriculture and animal husbandry?!

Disparity of the production time and working time, seasonal character of the agricultural production and slower capital turnover are a serious reason for this sector to be the subject of a special attention and help by the state, but not a sector with special presence of negligence and nondomestic treatment. Sooner or later you will have to deal with that problem.

Key words: *farming, agricultural production, import, export, business*

JEL*: Q11*

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Introduction

In the year 1937, the then Yugoslavia had 15.137.608 inhabitants on the 247.542 m²[4] area, and the agriculture represented the most important sector of economy. Yugoslavia's first years of existence were marked by the fact that 80% of the inhabitants were engaged in agricultural production, that involvement of the sector in the national income reached to 60%. Unfortunately, in the period between the two world wars, there was an excess of manpower who did not find employment in the undeveloped industry.

Irrespective of the fact that Yugoslavia in the period was mainly agrarian land, the attention to agriculture was not appropriate and in proportion with its significance for economic development of the country, in that period too. Although low cumulative and with slow capital turnover, over long periods of time, the agriculture was to be used for drawing benefits of other inadequate system of parity prices at the expense of agricultural products.

Agricultural production in Yugoslavia

By the available data, it could be said that by the middle thirties of the 20th century the agricultural production in Yugoslavia showed progress. The status was enabled by the well developed livestock, productive years as well as world market circumstances. "Consumption was greater than the offer so agrarian product prices on European market were high. Therefore, the prices in Yugoslavia were also high. As a result, during the period 1923-1924 the average wheat price on our market was 335 and 419 dinars during the period 1924 – 1925 per 100 kilograms. The average corn price was 250 and 219 dinars in that period. These prices, of course benefited the most to merchants, intermediaries and exporters, and the least to manufacturers."[5] Almost a century later, it seems that nothing has crucially changed.

In Yugoslavian agriculture livestock was one of the most important production sectors for it brought significant part of national income. In the entire export, livestock products made a third of its value. In 1937 in Yugoslavia the official list was published recording that in the year the country had 4.169.192 head of cattle, number of pigs was 3.179.661, number of horses 1.248.852, number of sheep 10 millions, about 2 millions goats, over 22 millions of poultry, about 811.738 bee hives manufacturing over 4,5 million kilograms of honey…[6] For example, in that 1937 the Yugoslavia had 17 factories producing canned fish, which was also exported in some amounts.

Limited and restrained development, more various agricultural production, and leaving manpower from agriculture in another profession, was primarily characteristic for agriculture after fifties. Social rural economies and agro-industrial host utility were strengthened, where the production as well as processing until the final product for the market was done. It had

4 Nikolic, M. M. (2008): Trgovina u Srbiji (Trade in Serbia 1804-1957), National library Vuk Karadzic, Kragujevac, p. 353.

5 Ibidem, p. 354

6 Encyclopedie economique des Balkans (1938), Belgrade, p. 56

a "negative effect on agricultural production as well as on processing facility. Separated from realization on the final market consumption, these two segments, and processing were constantly without floating capital and in searching for help in sowing and harvest."[7]

There was too much considering about political questions concerning villages and agriculture, but the main assignment connected to greater production based on greater productivity, saving and better organization, was neglected. The effects of such politics were noticeable on every step (deserted villages, land overgrown with weeds, destroyed livestock, not a sign of youth, old age households dying out, etc.).

In 1953 Law on Agricultural Land Fund of general social properties decreased farmer land fund to 10 hectares of cultivable land, and the excess above that maximum was given to the forming cooperative. The Law on Restitution of Land to peasants in 1990 had no sense or effect. Meanwhile many of the land owners had free schooling, got state scholarships, communal apartments, regular salaries and social insurance. "Instead of the returning the land to the peasants and the certain compensation to others, the land were returned to all of them, although many of the inheritances have never engaged in agricultural production. Well arranged land complex were once again disintegrated and fragmented by commassation and regrouping of holdings."[8]

According Prof. Petar Markovic's opinion, which is agreed by the majority of authors from the same science area, some elementary omissions in politics concerning village and peasantry have risen after 1948, are the following:

a) Forming cooperative is transformed to political action and did not fit to the great majority of peasants. The peasants' attachment to the land has been forgotten (the truth which has maintained the agriculture all this decades in impossible condition on the existing level). All this resulted in the decreased number of livestock, fruit-tree and grape-vines, and after forming cooperatives were disbanded there was nothing but debts and losses.
b) Obligatory redemption, no matter how important, by the way of performing and inflexibility of nutritional products, left peasants without products, and when forced to sell, the peasants even had to buy in order to sell amounts partitioned by the obligatory redemption. Unfulfilled obligations, confiscation of property, could cause significant peasants' political indisposition toward state.
c) With equal right of all inheritor, whether they occupy in agriculture or not, the economical basis of rural economy is decreased, fragmented and separates agricultural producers from agriculture.
d) Agricultural product prices, "through which peasants' work is valued, by the rule were low it did not satisfy peasant labour and a collection for delivered products was often more than a year late. With that open question of working capital for agriculture, very

7 Markovic, J. P., Babovic J. J. (1999): Srbija na pragu novog veka - buducnost sela i seljastva, Belgrade, p.238

8 Ibidem, p. 255

low investments put the agriculture in unequal economical position, which crucially contributed mass escape of villages and agriculture into cities and non-agricultural land."[9] Lot of additional issues, like defect of communal arrangement of village, where separation from gross citizens' income moved from the employment place instead of living place, had as a result the fact that villages were left without roads, telephone connections, waterworks, and usual city conditions. Nutritional industry objects were built in cities but the village remained a raw material base for industry. This is the segment where the strategic error was made. Had they been located in villages, the processing plants would have attached part of the population to village. Transport and residential expenses would have been significantly lesser. Negligence, bad intention, lack of common sense or all these together brought agriculture to this condition. Also, the process of impoverishment and decay of the village, which is began in socialism is much faster after implementation of the transition.[10]

Agricultural production, today, in Serbia

What is the condition today: "In Serbia on every 4,6 million hectares of cultivable agricultural land 10 million tons agricultural products valued about 3,3 billion euro, are being annually produced (in 2006)... Serbia gained $ 1,26 billion (the fifth of its total export) from the food export, in other words, agricultural-nutritional products in 2006, which agriculture classifies into small number of activities with surplus of $ 360 million in exchange with the world."[11] Valuation of mentioned author was that by 2010, with development of rural tourism, Serbia could have doubled food production and with value between 6-7 bil. EUR, and I think it was realistic had it been done properly.

Instead of the expected changes and in accordance with that mentioned result achievement, the production was still declining as well as the export effect. Meanwhile, agriculture was becoming less of a "last resort" in conditions of economical crisis. For example, Serbian Chamber of Commerce data have said that 2009 production of pork in regard to 2008 has 5% decreased, and in 2009 the import of pork and frozen slaughterhouse products of pork has reached 7,338 tons, which has been paid $ 18,2 million.

Table 1. Meat Production by Species in Serbia

Year	Beef	Mutton	Pork	Poultry	Total
1990	139	23	282	104	548
2000	104	19	283	67	473
2005	90	21	253	67	431
2007	95	20	289	70	474
2008	99	23	266	76	464

9 Ibidem, p. 255

10 Živković, D., Jelić, S., Rajić, Z., Peševski, M. (2011): Uticaj tranzicionih procesa na osiromašenje sela i poljoprivrede, Ekonomika poljoprivrede, Vol. 58, br 1, Belgrade, p. 100.

11 Gulan B. (2007): Agrobiznis i seoski turizam u Srbiji, Serbian Chamber of Commerce, Belgrade.

Year	Beef	Mutton	Pork	Poultry	Total
2009	100	25	252	80	457
2010	92	23	269	84	468

Source: RBS

The table clearly shows that the greatest downfalls happened in beef production[12]

Table 2. Import and export of beef

Year	Import		Export	
	kg	USD	kg	USD
1990	266.030	440.500	41.705	162.463
2000	133.003	106.616	4.145.473	8.049.329
2005	0	0	2.213.774	9.446.822
2007	6.290	43.389	9.158.468	38.790.363
2009	3.179	12.534	3.624.915	20.428.856

Source: RBS and SCC

Table 3. Import and export of pork

Year	Import		Export	
	kg	USD	kg	USD
1990	26.553.869	49.622.236	1.445.390	6.466.297
2000	0	0	860.893	1.531.345
2005	1.757.559	3.803.177	33.690	60.350
2007	1.296.004	3.902.748	2.267.785	6.315.737
2009	4.245.640	13.792.139	581.138	2.441.661

Source: RBS and SCC

Table 4. Import and export of poultry

Year	Import		Export	
	kg	USD	Kg	USD
1990	1.482.080	2.065.240	263.581	602.547
2000	2.183.952	1.811.532	279.379	284.901
2005	196.328	213.030	1.213.378	2.350.194
2007	196.133	429.108	2.305.637	5.495.131
2009	376352	821.848	1.676.971	4.753.776

Source: RBS and SCC

12 This is clearly caused by the reduction of the number of cows (from about 1.000.000 in 2000 to about 300.000 today)

In last two decades the number of livestock was declining 2 - 3 % per annual degree. The production of meat declined from 600.000 tons (in the 90s) to 457.000 tons in 2009. Meat consumption per residents in that period was twice smaller. Observed in international range, in meat production we participate with circa 0,17 % and that contribution within European production is circa 1,3 %, which testifies about relatively marginal international significance which was not the case in the past. The reasons for such a bad condition are numerous, but above all the reasons are: disturbed price parity, the loss of markets, impossibility to export in most cases, reduced purchasing power, disturbed financial system and lack of government support, insufficient financial means in agrarian budget, etc.[13]

Where do we go?

Family agricultural rural economy is based on ownership over land as the main resource, and it is entrepreneurially directed, in terms of production most often diversified, it is the activity based on family relying with comparative advantages on open market. Production process becomes coordinated with nature and preserves resources but occupation in agriculture is both business and a way of life. In order to make this our agriculture, and to make in it our agricultural producer, what is needed is: "By the proper stimulating politics it is necessary to increase capacity of domestic production, much more to stimulate export of nutritive agricultural products using various subvention ways. It is necessary to make maximum efforts to bringing back to our country the status of the most privileged nation in international trade in EU."[14]

From the specified demand for agricultural products, also results specific position of these producers' products. The demand for agricultural products is derived because it is defined by relation between consumers and products of higher processing degree. The demand for them also varies from tendency (marginal) towards consumption and savings, and changes in consumer income height, to flexibility offer and demand, comparing to the price changes of agricultural products, the demand for them also varies.

The principle of opportunistic needs imposes the solutions which recommend such production combination of work, capital and land with the greatest contribution. The problem of production structure most often comes to finding the best combination of livestock and vegetable production. That is again dictated by the existence of natural connections between certain plant culture and their effect on the livestock breeding.

13 Arsić, S., Kljajić, N., Vuković, P. (2012): Cattle stock and the analysis of total meat production in the Republic of Serbia, Ekonomika poljoprivrede, Vol. 59, No. 1, 2012, Belgrade, p. 100.

14 Vlahovic, B. (2007): Agrar Srbije na pragu evropskih integracija, Agriculture – Info, Faculty of Agriculture, Novi Sad.

Law of diminishing returns, characteristic for majority of the production processes, is the most obviously and the most drastically showed in agricultural production. There is a phenomenon on rural economy of aspiring to "compensation hardly greater from minimal average expenses, which equals with request of minimal profit. This attitude additionally effects on food offer decreasing and irrational use of resources on national level."[15] Not denying the exactness of the stated, I have to conclude that agricultural producer, inadequate economical politics over years, is brought in the coercion position of uneconomical behavior. It sometimes suits to consumer, but on long terms, undoubtedly, he loses too.

Incongruity of production and working time (because of biological character of agricultural production), where the time of production in agriculture, as a rule, is far longer than the working time; seasonal character of agricultural production; slow capital turnover etc., are characteristics of this sector which further, directly or indirectly reflect on demand as well as on status and way of life of agricultural producer. The rule for agricultural products offer is that it is completely inflexible in a short period of time.[16]

Only in agriculture can be applied so strong an argument that great is better and the small are nicer. Is this a big bite? When capital, property, the size of company etc. overcome the size of the optimal system by the view of organization and economy, the system moves to entropy. Then we say that the corporation outgrew, that it did not control cash flows, that it simply did not control the situation. Most often it brings down like a house of cards, with all the derived consequences.

Rural development "presents complex development of specific rural area based on available natural, material, infrastructural and human recourses which are managed with all due care on keeping the balance between human and nature."[17]

Keeping in mind some experiences, including personal matter, on the mentioned way of development also stands livestock production. From the tradition we could be proud of, to the very modest livestock fund (it does us credit), we took the path of stumbling and losses, of lifting, and new disappointments and came to the dearth and weakness which, in this significant sector, seriously burden us.

While this sector does not live but survives, does not develop but exists miserably in a helpless position crying for help in order to help others, processors as well as state remain deaf and blind. It is time for carelessness and negligence, I would also say for ignorance and ill intentions, to take revenge on everybody. It is obvious that we will pay one way or another.

15 Zakic, Z., Stojanovic, Z. (2008): Ekonomika agrara, Publishing Center, Faculty of Economics Belgrade, Belgrade, p. 121

16 What is sown can be harvested a destroyed breeding stock must wait years to be renewed etc.

17 Ibidem, p. 517

Considering this issue, and also modestly engaging in breeding high milk productive head of cattle (red and black Holstein), also the ones for meat production (by this I think Simental) I came to the economic account which showed:

- milk production, keeping in mind nowadays redemptory price, is a work which brings you loss, or positive zero (with great effort and night-and-day work);
- standard fattening bull calves is making drawback for a while, or the results are not worth mentioning.

Where is the chance that great number of family rural economies operate profitably in order to make this occupation a good combination of success and way of life?

In this moment it seems to me, some highly developed countries are becoming aware of that (which are slowly returning to extensive way of cattle breeding), that beef production in a system cow - calf (without milking), with the use of inexpensive food sources and Simental mottled bull calf, is just good base for crossbreed with fleshy breeds.[18]

Where the economic base for this idea comes from?

Quantity sufficient production of high quality beef, which we have imported more often in recent years, can be enough not only to satisfy domestic consumption but also to provide the export, and in that manner a significant influx of foreign currency. The production can also become a way of surviving for smaller and older rural economies, which can occupy themselves in that age too. In this way demesnes are used optimally (it becomes pasture for all vegetation period) with significant reduction of expenses which are caused by the tilling production, thus enabling neglected and uncultivated lands to function. With all this, there would be a need for new work places (the main production factor – human, became surplus labor in other sectors).[19]

Conclusion

Until the purchase price of milk and livestock, are at an average cost, will not be serious livestock production, or agriculture will be one's profession seriously. What is most important agriculture will not become, and especially cannot stand, as one's lifestyle.

One of the important conclusions is that it would not be possible to achieve significant surpluses of these products, and therefore no capital inflows from export. Unfortunately today and especially tomorrow this level of production will not be insufficient to meet even domestic demand for these basic life products.

18 The author slowly and patiently has been working for some time to educate his neighbours and friends in this issue.

19 For example in European Union 36% total number of cattle is produced in this system; In Germany in this way about 70% total amount of beef is produced, and the state stimulates this system with about 200 EUR per fattened beef, which is the case in neighbouring Croatia.

Doubling the budget for agriculture does not solve the problem. Fundamentally changes, with the priority status of long-term nature, is the beginning of problem solving. Critical investment fund (from both domestic and foreign sources) can be restored in the medium term (from own production) and become a new source of accumulation and investment.

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POLJOPRIVREDNA PROIZVODNJA I ZANIMANJE I NAČIN ŽIVOTA

Sveto Purić[20], Jelena Purić[21], Anja Savić Gligić[22]

Rezime

Poljoprivredu kao biznis i poljoprivredu kao način života, ako se istoj dobro želi nije moguće odvojiti. Ako ih odvojite, pitanje je šta će ostati i od jednog i od drugog. Ako se ne spoje ugrožena je nacionalna prehrambena sigurnost ali se ozbiljno ulazi u pitanje bezbednosti.

Dobra iskustva drugih jesu korisna i dobra, sopstvena su i korisnija i bolja. Organizmu upravo prija hrana dobijena na području na kojem čovek živi i radi. Ona druga je, pored visoke cene, nužno zlo. Uz to opterećuje platni bilans, umesto suficita pravi deficit. A uz to i ne prija. A gde je tu i zadovoljstvo bavljenja poljoprivredom i stočarstvom?!

Nepodudarnost vremena proizvodnje i radnog perioda, sezonski karakter poljoprivredne proizvodnje i sporiji obrt kapitala jesu ozbiljan razlog da ova grana bude predmet posebne pažnje i pomoć od strane države, a ne grana sa posebnim prisustvom nebrige i nedomaćinskog odnosa.

***Ključne reči**: poljoprivreda, poljoprivredna proizvodnja, uvoz, izvoz, biznis*

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Review Article

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EFFECTS OF AERATION ON GROUNDWATER QUALITY FOR IRRIGATION

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Summary

Volatility in agricultural production caused by the reliance on natural factors, and water is one of the basic, which provides greater production. Volatility in agricultural production caused by the reliance on natural factors, and water is one of the basic, which provides greater production.

The authors in their professional praxis have seen that the presence and absence of vadose zone in the upper part of aquifer, with inter-granulary porosity type, is a prerequisite for enhanced concentrations of iron and manganese in groundwater. The natural aeration zone in vadose zone of the upper part of aquifer enables additional enrichment of groundwater with oxygen, which is spent on the account of biochemical processes in the direction of their flow. The absence of this zone in aquifer directly influences higher iron and manganese content in groundwater, often above the permissible concentration in drinking water. In order to eliminate this problem, in this paper proposal of future works were made, different of the usual procedure of hydro geological research. It will be possible to examine the effect of aeration of groundwater in the aquifer, during the preparation of wells from which to irrigate the land.

Key words: *irrigation, unsaturated zone, iron, manganese, aeration, groundwater*

JEL: *Q10, Q25*

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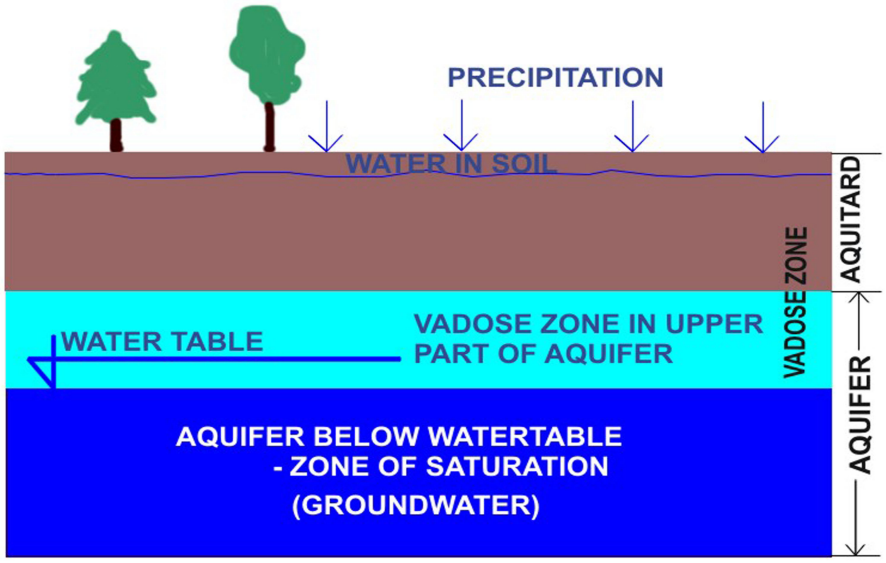
Introduction

Uncertainty that farmers have been following (product prices, capital and inflation rate) indicated their reservations by investing in jobs where long waits to benefit. Pros and cons of investing in irrigation systems can be found in the economic strength of the manufacturer and the state, conditions in the market of agricultural products and capital [5, 6]. Vadose zone is zone above water table, through which water is infiltrated, and in which the pores and cracks in the soil, and rocks are filled with air and partially with capillary water (Fig 1). This work processes the influence of part of the vadose zone which is situated (or is sometimes completely missing) in the aquifer with marked intergranulary type of porosity, i.e. in its upper or higher part on the content of iron and manganese. Namely, in this aquifer zone, natural aeration of the groundwater is made which has a positive influence on its chemical composition. Role of vadose-zone flow process is explained by Harter T. & Hopmans J.W. 2004 [7], Hopmans J.W. and M Th. Van Genuchten, 2005 [8], Rafferty K., 2001[18] and Harter T. 2003 [9].

One major cause of manganese mobilization in aquifers is reductive decomposition and dissolution of compounds such as Mn-OOH and MnO_2. In the normal pH range of groundwater (pH 5 – 8), dissolved iron is present as Fe^{2+}. The main sources of Fe^{2+} include [1-4,12-18]:

- the dissolution of iron (II) bearing minerals;
- the reduction of iron oxyhydroxides (Fe-OOH) present in the sediments e.g., magnetite, ilmenite, pyrite, siderite, iron (II) bearing silicates and clay minerals such as smectites,
- the oxidation of arsenopyrites.

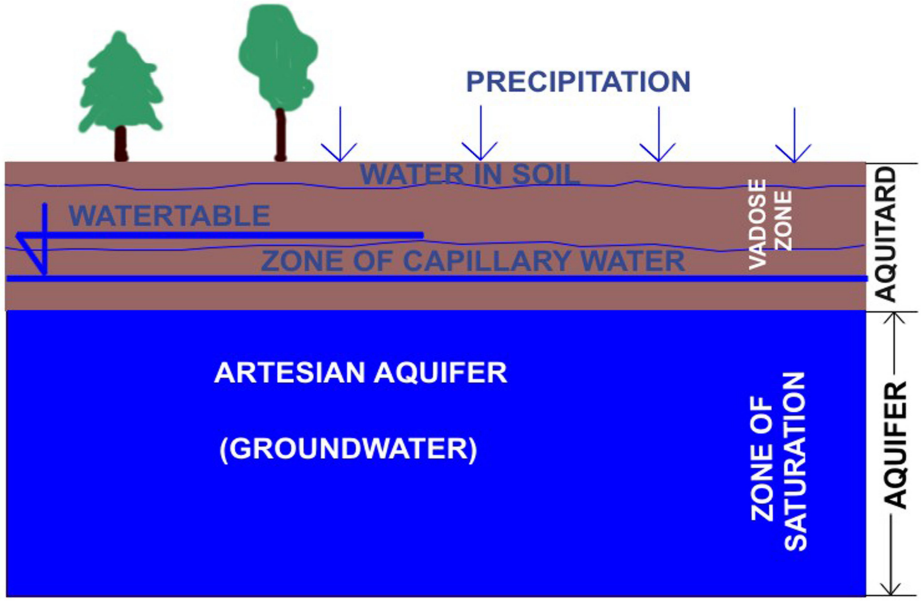
Figure 1. The scheme of the aquifer with present vodose zone in the aquifer itself



If the saturation zone in direct contact with aquitard in overlie of the aquifer, with marked inter-granular type of porosity, i.e. if the aquifer is sub-artesian or artesian (Figure 2), due to biochemical processes, anaerobic conditions are created which generates an increased content of iron and manganese in groundwater.

A good understanding of this influence can help the researchers with planning the research works, the choice of well location and projecting the well for abstraction of groundwater.

Figure 2. The scheme of vadose zone and saturation zone in aquifer with the level of water under pressure



The authors of this paper have noticed in their professional practice on many terrains in Republic of Srpska that the presence or absence of vadose zone in aquifer (zone of natural aeration), just above the water table, influences the content of iron and manganese in aquifers with strong inter-granular porosity type. It is often the case that this water cannot be used for water supply. In aquifers with fractured porosity type, this influence is not present because of the great speed of the groundwater flow, and the short time of retaining water in underground, and little total intensity of biochemical and chemical processes in groundwater.

Many cases with higher presence of iron and manganese and groundwater along with the absence of vadose zone in the aquifer itself, which proves spatial this dependence.

Presence and origin of iron and manganese in the groundwater

Natural conditions in our country are such that there are large areas that are saturated with water, and surface water is lacking. If irrigation systems are used properly and if we have good water quality, then we can expect higher yields, improved product quality, improved physical and chemical properties of soil, microclimate regulation of conditions in which the plant develops in surprising and application of certain agricultural practices. Otherwise, it may cause leaching of nutrients from the soil (error in determining the time of irrigation and irrigation rate), water-logging (due to water saturation, pushing the air out of the soil and leads to suppression of the root system), salinization (if the water has a high salt content) and deterioration of water-physical properties of soil (due to compaction reduces porosity).

Higher level of iron and manganese in water changes organoleptic properties because of sediment, which stands out (orange and brown color), it has an unpleasant smell and the taste of water associates with metal. Iron and manganese react with dissolved oxygen to form insoluble compounds. Therefore, they are usually not found in waters that contain high amounts of dissolved oxygen [13-15,17,18].

Interpretation of origin of these components in certain aquifer is different. The reasons are first to be searched in the existence of local pollutants in the zone of sanitary protection of water source. In certain cases the reasons are searched in mineralogical-petro graphic, i.e. lithological characteristics of terrain, because at first glance it is thought that the rocks, through which water passes are the cause of such an unpleasant the chemical content. However, the most common cases are those with higher presence of iron and manganese in groundwater, where there are no mineral deposits, rich with iron (alluvial, pliocene and pleistocene gravely-sadly aquifers). In sand and gravel, there are different minerals in the structure of grains made from dissolution of primary rocks, their transport and sedimentation in river valley and neogene basin. From the iron minerals, in sand the following can be found: magnetite (Fe_3O_4), siderite ($FeCO_3$), hercinite ($FeAl_2O_4$), jacobsite ($MnFe_2O_4$), franclinite ($ZnFe_2O_4$), chromite ($FeCr_2O_4$), etc. Frequently minerals of menganese are galaxy ($MnAl_2O_4$) and hrodochrosite ($MnCO_3$).

Apart from these, the presence of the following iron-manganese minerals is also possible: axinite, pyralspite, almadine, spessartine, turmaline, etc. Excerpts of dolomite and limestone, and deposited conglomerates, gravel and sand made from transport of these parts, usually contain chemical impurities of iron and manganese.

So, iron and manganese are practically present in all geo-environments, but in groundwater of all these environments, they are not present in higher percentage.

In the area of fractured limestone and dolomite terrains of Herzegovina and Romanija, and the basin of the upper flow of the river Drina, Bosna and Vrbas where the groundwater flow is fast, and where the upper part of aquifer has present vadose zone, i.e. the aquifer is not artesian, ground-waters do not have a higher content of iron and manganese. However, ground-waters of the Pannonia basin rim (in the immediate catchment of the

river basin in the territory of Republic of Srpska) and some aquifers in northern part of Republic of Srpska and Brcko district have higher content of these elements in wider area, in what the authors of this work convinced through their own hydro geologic and hydro chemical research, i.e. based on the results of physical-chemical water analysis results, whose statement is given in this paper.

Correlation of vadose zone existence in aquifers with inter-granular porosity type and iron and manganese content in groundwater

In the following text, the examples of presence or absence of close zone of natural aeration in vadose zone of the aquifer itself are presented, with present air above the level of groundwater, and along with that, the presence of iron and manganese in those aquifers. This type of correlation of two characteristics of aquifer can give contribution to the understanding of existence and intensity of this dependence, i.e. influence.

In the far northeast of Republic of Srpska, in peripheral part of Pannonia basin (Semberija and Posavina), with many years of research and following, we established that groundwater in pliocene gravel and sand sediments from the recharge zone (I) and closer zone (II) in mountainous part of Majevica mountain, have good quality. But, in further zones of ground flow (IV), ground-water have increased content of iron and manganese sometime in some of boreholes in artesian aquifer near river Sava. In Fig. 3 a conceptual hydrogeological model of peripheral part of Pannonia neogene basin, which in the zone far from the recharge zone, does not have vadose zone in the aquifer itself, i.e. there is no natural aeration, so it has anaerobe conditions and by that the conditions for generating higher content of iron and manganese. Figure 3 shows simplified schematic display of the zone of higher iron content in artesian groundwater on the peripheral part of Pannonia basin in the function of nonexistence of vadose zone in aquifer itself, and on the account of consumption oxygen during transport of groundwater

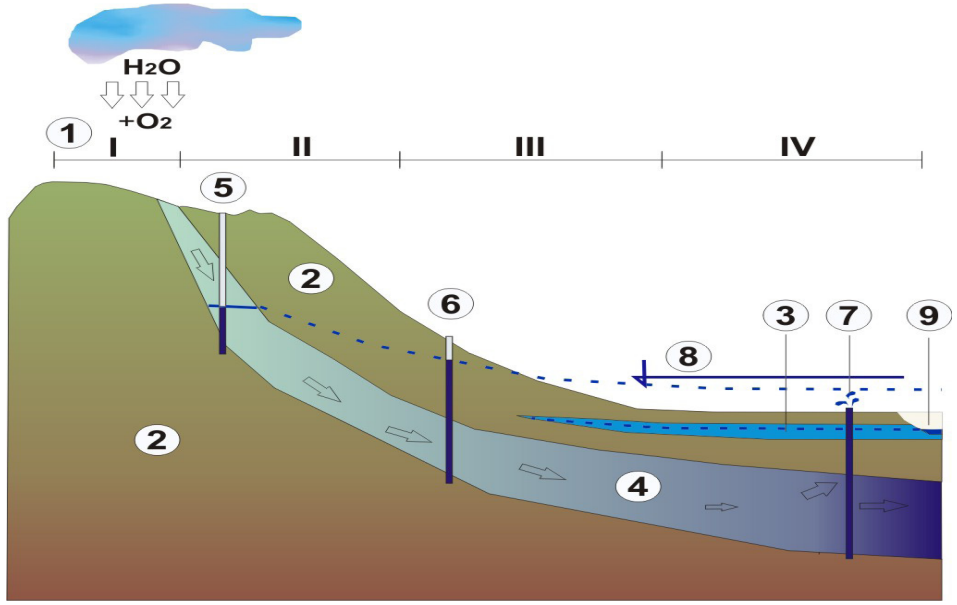
The so-called consumption oxygen in groundwater flow happens because of present microorganisms in water, on the account of biodegradation of organic matters in groundwater and geo-environment, and on the account of chemical processes of oxidation in geo-environment. A rainwater contents average 63,2% nitrogen, 35,0% oxygen and 1,8 % CO_2 [3,7]. That implies high content of dissolved oxygen in groundwater, because in hilly terrains, where pliocene layers have contact with surface, recharge of aquifer is done mainly from rainfall with dissolved oxygen.

In transitional zone (III), i.e. in the first part of groundwater flow, although there is no present vadose zone of natural aeration in the aquifer itself, oxygen dissolved in water is "wasted", so water in that part of aquifer in its physical-chemical characteristics corresponds drinking water.

Spatial distribution of water with different quality is interesting in the same aquifer, from the aspect of drinking water norms.

In the zone closer to the recharge zone of this part of ground water flow, water in its physical-chemical structure, often matches the norms of drinking water, but is microbiologically faulty. In transitional zone it is both physically-chemically and bacteriologically valid. However, om the zone further from the recharge zone, i.e. in the zone where the whole aquifer is in saturation zone, where vadose zone in aquifer is completely missing, water becomes faulty to drink due to higher content of iron, and sometimes manganese, although it is still bacteriologically correct (example of Posavina). Higher content of iron in aquifers is contributed by little speed of underground flow, present marly sediments and peat, as well as low pH [13-15].

Figure 3. Simplified schematic display of the zone of higher iron content in artesian groundwater on the peripheral part of Pannonia basin

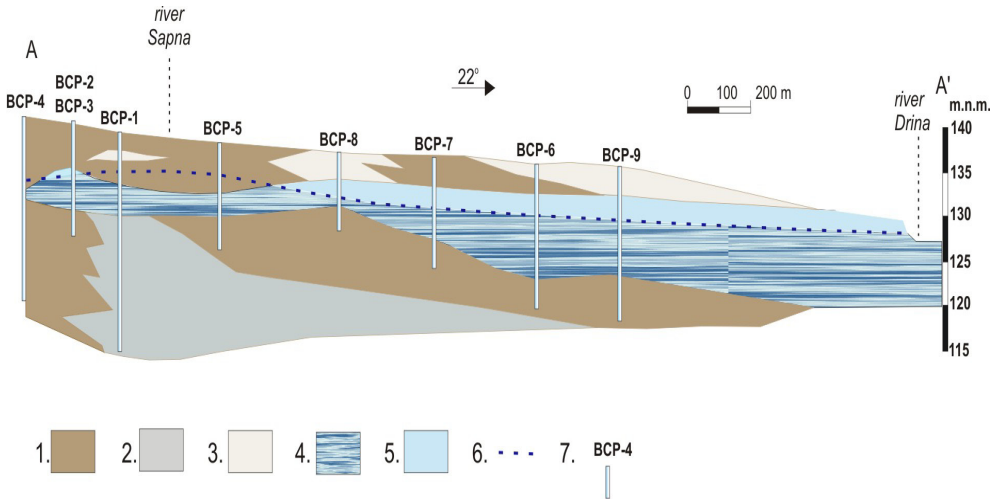


Legend: I Recharge zone, II Zone of good quality of groundwater, III Transitional zone, IV Zone of groundwater with higher content of iron and sometimes manganese, 1 - Infiltration area, 2 - aquitard, 3 - Unconfined aquifer, 4 Confined aquifer, 5 Water well, 6 Nonflowing artesian well, 7 Flowing artesian well, 8 Water table, 9 River.

Higher content of iron near the City of Zvornik (Fig. 4) is recorded in water from piezometer BCP-4 [3,8], concentration 9,8 mg/l and manganese 4,0 mg/l, and in piezometers BCP-7, 6 and 9 in the limits of drinking water [13-15].

This can be explained by presence, i.e. absence of vadose zone and bigger speed of underground flow in the parts of alluvium which is closer to the river Drina.

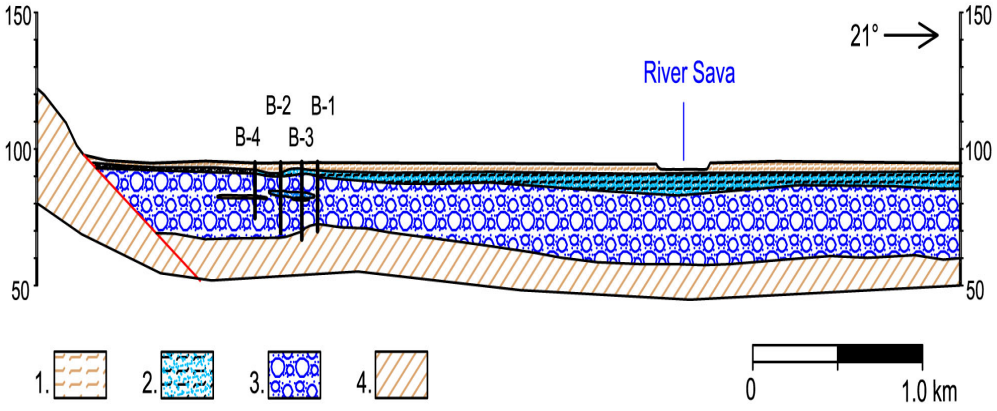
Figure 4. Hydro geological cross section of area near Zvornik with higher content of iron in water in one part of cross hole (borehole BCP-1 where the level of the groundwater is in the zone of clay over layer i.e. there is no vadose zone in aquifer



Legend: 1. Clay, 2. Marl, 3. Sand and sand with clay, 4. Aquifer below the water table, 5. Vadose zone of aquifer, 6. The water table, 7. Borehole

Higher content of iron from 0,72 – 1,7 mg/l and manganese from 0,20 to 1,55 mg/l (Table 1), and occasionally ammoniac in groundwater near Kozarska Dubica (Figure5) is the result of anaerobic conditions in the zones where vadose zone in the aquifer itself is missing (this is determined by boreholes in areas Djolovi and Medjedja).

Figure 5. Cross section of spring Medjedja for water supply of Dubica – the whole aquifer in saturation zone i.e. below the water table



Legend: 1. Clay, 2. Clay and sand with clay below the water table (zone of saturation), 3. Sandy gravel, 4. Underlie aquifer

Table 1 shows the values of iron and manganese content in groundwater at the fourteen different locations in river basin of rivers Drina, Bosna, Ukrina, Vrbas, Sana and direct basin of Sava. The authors of this work have established the same dependence.

Table 1. Display of results of analyses of content of Fe, Mn in quaternary age aquifers in the neogene basins of Republic of Srpska

Location	Name of water well/borehole	Age of aquifer: 1. Quaternary (alluvial or terrace sediments) 2. Pliocene or pleistocene(pl)	River basin	Fe (mg/l)	Mn (mg/l)	Presence of vadose zone in aquifer itself +/-
PS Mejdan at City of Zvornik	B-1	al	Drina	max 0,1	max 0,01	+
Čelopek near City of Zvornik	BČP-1	al	Drina	9,80	4,00	-
Čelopek near City of Zvornik	BČP-6	al	Drina	0,08	0,00	+
Kozluk near City of Zvornik	VEB-1	al	Drina	max 2,80	max 0,10	-
Brodac near City of Bijeljina	B-1	pl	Sava	0,57	0,00	-
PS Grmić near City of Bijeljina	*	al	Drina	max 0,1	max 0,01	+
PS Plazulje near City of Brčko	*	al	Sava	max 2,00	max 0,35	-
EFT Stanari near City of Doboj	BS-12	pl	Ukrina	max 3,27	max 0,30	-
PS Rudanka near City of Doboj	*	al	Bosna	max 0,2	max 0,01	-
PS in City of Brod	*	al	Ukrina	max 4,00	max 0,07	-
PSRafinerija Modriča	*	al	Bosna	max 0,2	max 0,01	+
"Stirokard" City of Srbac	BS-2	al	Vrbas	1,70	0,05	-
PS Međeđa City of Koz. Dubica	*	al	Sava	max 1,70	max 1,55	-
Mira in City of Prijedor	BM-2	pl	Sana	max 1,74	max 1,75	-

* - group of wells

The results of correlation with presence, i.e. absence of vadose zone in the aquifer itself shows the clear connection between the lack of vadose zone and higher content of ions in water. This influence is present in such degree that water cannot be used for water supply without previous treatment.

In alluvium of bigger rivers such as the river Sava, the river bed is carved in clay and alluvial gravel and sand which often have no direct connection with significant aquifer in depth of several tens of meters because of clay aquitard layers between them. Recharge of deeper aquifer happens, most frequently upstream, and it is far tens of kilometers from exploitation well. Great lengths of the underground flow from the zone of recharge as well as in regimes of artesian aquifer of peripheral parts of big neogene basins, slow water replacement, biochemical processes and aquifers, and the lack of vadose zone in the aquifer itself are a precondition for higher content of iron and manganese.

The consumption of oxygen in a slow groundwater flow because of biochemical processes happens as well in this type of aquifer, by the bio-degradation processes of organic matters, presence microorganisms in groundwater, and by chemical processes of oxidation in aquifer.

Such is the case in most part of Cities of Brcko, Samac, Brod and Gradiska.

This work also shows aquifers from alluvial and terrace's gravel and sand in which vadose zone is present in upper part of aquifer, so the content of iron and manganese in groundwater is in limits of drinking water (PS Mejdan, Čelopek - Zvornik, Grmić at Bijeljina, Refinery Modriča, PS Rudanka near City of Doboj).

Depending on the manufacturer's production orientation, economic and technical opportunities, climate and soil should endeavor to supply technology and favorable water-air regime, contribute the maximum use of cultural practices, efficient use of water and reduce operating and maintenance costs of the system. Probably, the most difficult task for manufacturers is to provide financial resources because it is an investment that has a long implementation period and a long payback period. The length of the implementation period in addition to natural factors affect the possibility of providing funds and equipment, its cost, and the state of the market for agricultural products. Application of mathematical and statistical methods can reach optimal program of agricultural production in the conditions with and without the use of irrigation and realization of given constraints and achieve optimization criteria. This also determines the justification of investments as follows the effects arising from changes in income and expenses [5, 6].

Conclusion

Higher volume of agricultural production, in terms of higher degree of utilization of other factors, can be achieved by irrigation. Because of the large investment necessary to shorten the period of the investment, bearing in mind the fact that the proposed solution should preserve or disturb as little as possible of the existing properties of the soil, contribute to efficient use of water and the efficient application of other agricultural practices. By correlation of iron and manganese content in aquifers of kvartarna age and subarteskim and arteskim aquifers in negenskim basins of Republic of Srpska and Brcko district with the existence of vadozna zone in the aquifer itself, the authors of this work have made a conclusion that nonexistence

of vadozna zone in the upper part of the aquifer itself, with the condition of sufficient length of podzemni tok in such conditions, creates a crucial prerequisite of higher iron content, and occasionally manganese in groundwater.

According to this criterion, the authors of this work stress the following:

- The zone of aquifer with present vadose zone in the aquifer itself (content of iron and manganese in the limits of drinking water),
- Transitional zone, and
- Zone of aquifer without present vadozna zone in the aquifer itself (the content of iron and manganese is higher in relation to the drinking water norms).

Contribution to the knowledge of the influence of vadozna zone in the aquifer itself to chemical content of water can help researchers with planning, research, predicting, the choice of location and projecting wells for underground water abstraction and planning treatment plants and total investments.

Acknowledgement

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EFEKTI AERACIJE NA KVALITET PODZEMNIH VODA ZA NAVODNJAVANJE

Zoran Rajic[7], Vaso Novakovic[8], Miladin Gligoric[9], Caslav Lacnjevac[10], Ranko Grujic[11], Dragić Živković[12]

Rezime

Nestabilnost poljoprivredne proizvodnje uslovljena je oslanjanjem na prirodne faktore, a voda je jedan od osnovnih koji obezbeđuje veću proizvodnju. Ulaganja u sisteme za navodnjavanje su neophodna, ali uz konstantna tehnološka poboljšanja i ekonomsku ocenu investicije. U praksi je dokazano da je prisustvo i odsustvu vadosa zona u gornjem delu izdani, sa intergranularim tipom poroznosti, preduslov za pojavu povećane koncentracije jona gvožđa i mangana u podzemnim vodama. Prirodna aeracija oblasti u vadosa zoni u gornjem delu izdani omogućava dodatno obogaćivanje podzemnih voda sa kiseonikom, koje se izvodi na račun biohemijskih procesa u njima. Odsustvo ove zone u akviferu direktno utiče na veći sadržaj gvožđa i mangana u podzemnim vodama, često iznad dozvoljene koncentracije u vodi za piće što će imati negativno dejstvo prilikom navodnjavanja površina. Kako bi se u budućnosti eliminisao ovaj problem u radu su date preporuke, promene uobičajene procedure hidrogeoloških istraživanja, da se sagleda efekat aeracije vode u akviferu, tokom pripreme bunara iz kojih će se navodnjavati zemljište.

Ključne reči: *navodnavanje ,nezasićena zona, gvožđe, mangan, aeracija, podzemne vode*

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ECONOMIC POSITION OF SERBIAN AGRICULTURE IN THE TRANSITION PERIOD[1]

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Summary

The authors wish to present economic position of agriculture in Serbia in the period of transition. Agriculture represents the base and starting point of economic development. Authors observe economic position of agriculture through four indicators by which is determined the importance of agriculture within the national economy. Mentioned indicators are: share of agricultural population in total population; share of agricultural population in total active population; share of agriculture in net national product creation; and participation of agriculture in creation of foreign trade balance. Later, authors provide a brief overview of transition process in Serbia, as well as its impact on the economic position of agriculture.

Key words: *economic position of agriculture, Serbian agriculture, transition period.*

JEL: *O13, P2, Q15*

Introduction

Agriculture is the oldest branch of the economy that people have always practiced. Currently the majority of world population is still engaged in agriculture. Up to XVIII century agriculture was in almost all countries the predominant economy branch. Just in XIX century with rapid industrial development in developed countries agriculture was pushed to the second and third place. There are not enough developed countries in true sense, considering that even today more than half of humanity is still engaged in agriculture.

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The importance of agriculture is higher in countries that are on lower level of economic development, and lesser in countries that were achieved through industrialization a higher degree of economic development.

Modernization and progress of agriculture depends in many ways from implementation of industrial methods, tools and organization of work. Mentioned makes us to believe that the development of agricultural production is forced by factors that are outside of agriculture. In fact, agriculture is just a base, or starting point of economic development, where developmental impetus comes from industry. Basically, that means when economic development is initiated by industrialization, functions of agriculture could be completely expressed, in other words begins a process of its industrialization.

Agriculture should be observed in two aspects. On the one hand, agriculture is important as a primary producer of food and other plant and animal products and this importance undoubtedly increases. Additionally, agriculture is the basis for initiation of economic development. To what extent the agriculture will be present as the basis for faster economic development depends not only from natural resources that is posses, but also from social, economic, political and other factors.

Indicators of the economic position of national agriculture

According to economic science economic position of agriculture is determined on the basis of four indicators. By them it is possible to present the importance of agriculture within the national economy[5], or in other words it could be measured the significance of agriculture in complete economic development. Mentioned indicators include:

- Share of agricultural population in total population;
- Share of active agricultural population in the total agricultural population;
- Share of agriculture in the creation of net national product (NNP); and
- Participation of agriculture in creation of foreign trade balance.

First indicator, share of agricultural population in total population is the most general indicator that describes importance of agriculture within the total economy. High share of agricultural population within the total population indicates the great importance of agriculture for national economy. Domination of agriculture and agricultural population could be considered as a sign of economic underdevelopment. In particular, traditional agriculture is synonym for economic underdevelopment. Percentage of agricultural population in developed countries was reduced to a negligible number. In some EU countries also have come to decrease of the number of inhabitants that are active in agriculture. According to data from 2007, in the UK 1,4% of total population were involved in agriculture, in the Belgium (1,9), Germany (2,2%), Denmark (3,0%), Netherlands (3,1%), France (3,4%), Bulgaria (7,5%), Slovenia (9,9%), Greece (11,5%), Poland (14,7%), Romania (29,5%), etc[6]. Serbia has also followed mentioned global

5 Stipetić, V. (1968): Ekonomika Jugoslavije - II deo, Informator, Zagreb, str. 7.

6 Agriculture in the European Union - Statistical and economic information 2008, European Union, Directorate general for agriculture and rural development, Brussels, 2009, p. 149.

trend. According to data from 2009, percent of agriculturalists within the total number of population was 10,9%, what is much lower than value of same indicator in 1991 (17,3%)[7].

Share of agricultural population within the total active population represents more precise indicator by which could be determined the importance of agriculture for the national economy. For the years development of non-agricultural activities was taking place mainly at the expense of manpower from agriculture. In line with that higher level of agricultural development is conditioned by the relative decrease of the share of active population in agriculture.

From the economic aspect, maybe the best indicator that describes the importance of agriculture within the national economy is the share of agriculture in creation of net national product Parallel with the development of economy comes to decrease of the share of agriculture in creation of net national product, while in same time comes to increase of non-agricultural activities.

As like in previous cases, by the last indicator, participation of agriculture in creation of foreign trade balance, it could be concluded that share of agriculture in total export decreases with the development of economy. Within the economies that are at lower level of development export of agro-food products has a dominant role in the creation of total export value.

Share of agricultural population in observed period was expressed by rapid process of deagrarization. Share was reduced from 66,0% to 10,9%. The largest fall was within the period 1971-1981, when share of agricultural population in total population was almost halved, Table 1.

Table 1. Share of agricultural and active agricultural population (in%)

Year	Share of agricultural within the total population (in %)	Share of active agricultural population in total agricultural population (in %)	Activity rate of agricultural population
1953	66,0	73,2	56,0
1961	55,0	62,0	55,4
1971	42,7	53,3	61,3
1981	25,5	35,0	51,5
1991	17,3	22,8	67,7
2002	10,9	15,6	69,3

Source: Population census, 1953-2002.

According to census in 2002, percent of agricultural population in Serbia was fallen to 10,9% of total population. Mentioned percent of agricultural population is still high in compare to developed countries. Similar trends are if is observed decrease of active

7 Stanovništvo i domaćinstva Srbije prema popisu 2002, Republički zavod za statistiku Srbije, Beograd 2006, str. 243.

agricultural population in total agricultural population, from 73,2% in 1953 to 15,6% in 2002. The largest decrease was also happened within the period 1971-1981 (21,6 %) .

In last ten years, share of agriculture in net national product (NNP) creation was relatively unchanged (Table 2). The lowest share of agriculture was recorded in 2010 (7,9%), while its maximum was reached in 2000 (19,9%). Within the observed period (1997-2010) indicator had moderate oscillations and unfortunately under the affects of global economic crisis in last two years it had again negative trend.

Table 2. The share of agriculture in net national product creation (in %)

Year	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Share of agriculture in NNP (in %)	16,0	15,3	18,8	19,9	19,8	15,0	13,3
Year	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Share of agriculture in NNP (in %)	13,9	12,1	11,2	8,2	9,0	9,3	7,9

Source: Bilten no. 523, Poljoprivreda, 2009, Republički zavod za statistiku.

From the economic point of view the best indicator that describes importance of agriculture within the economy is certainly share of agriculture in creating the NNP. It is understandable that economic development leads to decrease of share of agriculture in NNP, while the share of non-agricultural activities is increasing. In other words with economic development decreases the importance of agriculture in the creation of national net product[8].

Observing the importance of agriculture according to its participation in creation of foreign trade balance, it could be noticed its positive contribution within the total foreign trade. With the exception of 2001 in all years of the observed period foreign trade balance of agriculture was positive (surplus). On the other hand, according to natural potentials and production predispositions, agriculture had (Table 3) relatively low share in the value of total Serbian export.

Table 3. Share of agriculture in the value of total national export and import (in %)

Year	**Export**	**Import**
2001	2,6	3,8
2002	6,3	2,8
2003	3,8	2,5
2004	3,3	2,6
2005	4,3	2,2
2006	4,8	2,0
2007	4,0	2,0
2008	3,5	1,7
2009	6,4	2,2

Source: Bilten 523. Poljoprivreda 2009. Izdanje Republičkog zavoda za statistiku.

8 Popović, R. (2001): Ekonomski položaj poljoprivrede u Jugoslaviji, Anali ekonomskog fakulteta u Subotici, br. 6, Subotica, p. 222.

Additionally, it has to be noted that global economic crisis significantly affected the size of budget expenditures directed to the Ministry of Agriculture. Although the agriculture has great importance for national economy, in next table can be seen that official budgetary support to agriculture unfortunately was sorely restricted (it was in range of around 3,5% of total budget expenditures)[9].

Table 4. Share of agricultural budget in total budget of Republic of Serbia (in mil RSD)

Year	Total budget expenditures	Agricultural budget (I+II)	Assets from budget (I)	Expenditures from additional incomes (II)	Share of agricultural within total budget (in %)
2009.	748.652,9	25.616,4	20.502,7	5.113,7	3,42
2010.	762.971,0	25.621,8	19.907,9	5.713,9	3,36
2011.	846.919,9	32.593,8	22.033,8	10.560,0	3,85
2012.	940.157,5	49.485,5	22.858,4	26.627,1	5,26

Source: Law on budget of Republic of Serbia for certain years

Mentioned could lead to conclusion that Serbian agriculture in observed period realized its primary function to provide enough food for its own population and to export certain volume of surpluses.

Transition period and economic position of agriculture

The official policy of the countries in transition has evolved. It was reoriented again to market-based agriculture concentrated on private land ownership. Organization of agricultural production is based on the individual producer, while cooperative farms started to lose its importance[10]. With 1990th, entire region of Eastern and Southeastern Europe began with transformation of their economies from governmental (planning) to market economy. All former socialist countries within the mentioned regions accepted almost identical directives for reform of their economic systems (sector of agriculture was assumed), identified in:

1. liberalization of prices and market;
2. privatization of land ownership and transformation of economic structures;
3. de-monopolization and privatization of systems for food production and trade;
4. establishment of functional system with developed institutional structure, as well as governmental system adapted to market economy[11].

9 Dynamic development of agriculture can be expected only in situation if agricultural budget is minimally around the level of participation of agriculture within total GDP.

10 Lekman, Z., Csaki, C., Feder, G. (2004): Agriculture in transition land policies and evolving farm structures in post-Soviet countries, Lexington Books, Lanham, p. 61.

11 Csaki, C., Nash, J. (1998): The agrarian economies of Central and Eastern Europe and the Commonwealth of Independent State, Situation and perspectives 1997, World Bank discussion paper no. 387, Washington, p. 10.

After a decade of reforms, within the period 2001-2003, countries of Central and Eastern Europe were achieved positive growth rates of real GDP (average growth rate of GDP was 4,4%), parallel with establishment of price stability on their markets[12]. Accession of twelve newcomers into the EU has led to doubling of available agricultural labour and surfaces under arable land within the new community. Although the share of agricultural population and participation of agriculture in total GDP, with the fall of socialism, were decreased in transition countries, they were still higher than achieved indicators in EU countries[13].

In Serbia transition period also began with fall of the Berlin Wall in late eighties of XX century. Interesting fact is that countries of former Yugoslavia at the beginning of transition period were within the group of countries that were best prepared for transition processes (Yugoslavia was one of the few socialist countries in which functioned system of market economy, where the major volume of foreign exchange was with the Western Europe countries)[14]. It was initiated with many external constraints, before all economic sanctions of world community (UN) and physical destruction of economy by bombing in 1999[15]. These circumstances have affected stopping of transition process flow on several occasions[16]. In other words, estimates are that real beginning of transition process in Serbia, in compare to other countries in transition, was delayed for nearly a decade. This fact puts Serbia to the bottom of the list of transition countries (clear example of country with late transition).

Based on above mentioned, it could be concluded that transition greatly affects on economic position of agriculture in Serbia. The transition of Serbian agriculture created certain negative effects, but on the other hand it provides clearer picture of national agriculture, thereby creating the conditions for new investments. Additionally, actual situation of Serbian agriculture in final stage of transition can be presented by next SWOT matrix[17].

12 European Central Bank, National Statistics, DIW Berlin calculations, 2004.

13 Cvijanović, D., Simonović, Z., Mihailović, B. (2011): Težišta i ciljevi novijih reformi agrarne i regionalne politike Evropske unije, Ekonomika poljoprivrede, p. 359-370.

14 Stevanović, S., Đorović, M., Milanović, M. (2009): Reciprocity between level of development of economy and results of transition, Ekonomika poljoprivrede, p. 551-564.

15 Mihailović, B., Simonović, Z., Cvijanović, D. (2009): Uzroci, karakteristike i ciljevi tranzicije u Srbiji, Ekonomika, p. 151-157.

16 Simonović, D., Simonović, Z. (2005): Problemi tranzicije poljoprivrede i procesi integracije u Evropi, Međunarodni naučni skup - *Procesi integracije u Evropi*, Ekonomski fakultet u Nišu, Ekonomske teme no. 1–2, p. 333 – 339.

17 SWOT analysis represents method that provides an opportunity for establishment of balance between internal abilities and external possibilities of certain branch of economy, enterprise, or territorial unit. In represented case, concept estimated how much agriculture as part of economy is competitively capable to use possibilities to stop or redirect threats, or in negative scenario to engage available resources and assets to overcome the threats.

Table 5. SWOT matrix of Serbian agriculture

INTERNAL FACTORS	
STRENGTHS (advantages)	**WEAKNESSES (disadvantages)**
- Favorable geographical position, climatic conditions and rich hydrography as preconditions for agriculture; - Natural resources (mineral-raw complex, agricultural land, thermo-mineral water, forests, forests fruits and medicinal plants, richness in biodiversity, etc.); - Existence of unpolluted environment as good capacities for organic food production; - Tradition in production of autochthonous species and products (honey, cheese, schnapps, meat and meat products, etc.); - Supply infrastructure (cooperative farms, repurchase centres, production and processing facilities, etc.); - Certain projects in field of cross-border cooperation, development of agriculture and rural tourism; - Fast access to Pan-European Corridors X, Vc and partly IV, as well as nearness of Pan-European Corridor VII (Danube River); - Free trade agreements with countries in Southeast Europe (CEFTA), Russia, and great preferences in trade with EU and USAListenRead phonetically, etc.; - Tradition and commitment to agriculture and experience in processing industry; - Certain level of agricultural products/food price competitiveness; - Surplus in foreign trade balance of agriculture.	- Large share of extensive in total agricultural production; - Low share of livestock breeding; - Un-established ecological profile of soil; - Unfavorable education structure of rural population and lack of motivation at young population to continue with agriculture; - Insufficiently developed physical, social and communal infrastructure in rural areas; - Obsolete mechanization, atomized estates, underdeveloped irrigation systems and insufficient usage of agro-technique; - Insufficiently developed SME's sector, as well as presence of inactivity in actual associations of entrepreneurs, or shortage of new professional associations; - Disorganization of agriculturalists and lack of agro-clusters; - Insecure channels for realization of agricultural-food products (lack of contracted production, disorganized repurchase, high influence of black market, monopolized market, etc.); - General lack of adequate quality certificates and insufficient integration of innovative technologies among agricultural producers; - Small agricultural budget; - Unfavorable investment activity in maintaining of existing and building new physical and social infrastructural elements in rural areas.

EXTERNAL FACTORS	
OPPORTUNITIES (possibilities)	**THREATS (risks)**
- Choice of multifunctional agriculture and sustainable rural development; - Utilization of demand and offer trend of organic food, medicinal herbs and forest fruits, as well as for branded and products with geographical indications; - Branding of agricultural products by establishing of agri-business centres; - Support to use of alternative/ecological resources of energy; - Potentials for development of spa, rural, excursion, eco, hunting and fishing tourism; - Use of state (ministry, NIP, funds for organization of public works, etc.) and other funds (pre-accession funds of EU/ IPA, international projects and programs, etc.); - Arrival of foreign investors and cooperation with potential returnees from abroad; - Membership in the WTO.	- Migration of population and low rate of natural increase; - Destruction of natural resources, increase of pollution of environment and strong dependence of weather conditions; - Increase of demand for GMO food and appearance of modified animal and plant diseases; - Insufficiently developed market of agricultural products; - Unstable political-economic situation and unbalanced regional development; - Eventual stopping of accession process to EU; - Underdeveloped financial and agricultural credit markets; - Sophisticated foreign demand and high requirements in terms of food safety and quality standards.

Conclusion

Besides time analysis, for gaining of more realistic picture of economic position of agriculture within the transition process, it is also necessary to include spatial analysis. Therefore, in comparison were involved countries of Eastern and Central Europe that have gone through this process. Comparison was made according to data from 2004.

Based on presented data it can be concluded that importance of agriculture in economic system of Serbia is significantly higher than in systems of the countries that exit the transition process (these countries are now full members of EU). According to observed criteria (Table 6) may be noticed that after Poland Serbia has the highest share of active agriculturalists within the total labour fund.

Table 6. Indicators of agriculture in some transition countries (in 2004)

Country	Agricultural land (000 ha)	Active farmers (000)	Share of active farmers in total labor (%)	Share of agriculture in GDP (%)	Share of agriculture in foreign trade (%)	
					Export	Import
Czech Republic	4.273	427	7,5	3,3	3,6	5,4
Estonia	698	76	10,5	4,3	8,4	11,3
Hungary	5.867	454	9,6	3,8	7,6	3,6
Latvia	2.474	139	11,0	4,4	12,1	21,0
Lithuania	3.487	191	10,8	5,9	10,6	8,0
Poland	18.345	4.073	20,2	5,1	7,8	5,8
Slovakia	2.433	249	8,3	3,6	3,2	5,3
Slovenia	505	15	1,5	2,7	3,7	6,4
Serbia	5.734	539	15,6	11,4	3,3	2,6

*Source: www.*faostat.fao.org www.earthtrends.wri.org

If it is observed the share of agriculture in GDP, Serbia gains the highest value of this indicator (11,4%), or share of agriculture in national GDP creation is much more expressed than in other countries. Participation of agriculture in foreign trade balance (especially export) is relatively low, although the constant presence of surplus. Finally, next can be concluded - National agriculture still exists despite the lower level of economic development.

On the other hand, the economic position of agriculture in Serbia is worse than in the observed countries. Nevertheless, according to presented SWOT matrix it can be noticed that agriculture in Serbia has great opportunities for further development. State has to be the one that will through their measures (subsidies, tax reliefs and other financial supports) accelerate the development of agriculture.

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EKONOMSKI POLOŽAJ POLJOPRIVREDE SRBIJE U PERIODU TRANZICIJE

Zoran Simonović[18], Marko Jeločnik[19], Zoran Vasić[20]

Rezime

Radom autori žele da pokažu kakav je ekonomski položaj poljoprivrede u Srbije u periodu tranzicije. Poljoprivreda predstavlja osnovnu i polaznu bazu privrednog razvoja. Ekonomski položaj poljoprivrede je posmatran kroz četri pokazatelja pomoću kojih se određuju značaj poljoprivrede u privredi. To su: udeo poljoprivrednog stanovništva u ukupnom stanovništvu, udeo poljoprivrednog stanovništva u ukupnom aktivnom stanovništvu, učešće poljoprivrede u stvaranju nacionalnog dohodka i učešće poljoprivrede u stvaranju spoljno-trgovinskog bilansa. U nastavku autori daju kratak osvrt na proces tranzicije u Srbiji i njen uticaj na ekonomski položaj poljoprivrede.

Ključne reči: *ekonomski položaj poljoprivrede, poljoprivreda Srbije, tranzicija.*

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DIRECT EFFECTS OF THE CAP IMPLEMENTATION IN POLAND - EXPECTATIONS UP TO 2020

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Summary

When Poland accessed the EU it was covered by regulations significantly changing the conditions of food economy. Mutual opening of markets multiplied the possibilities of market outlets and contributed to the better competitiveness of economic entities. The launched public funds helped, for instance, to modernise farms and food industry businesses, improvement of their competitiveness, construction of infrastructure or multi-functional development of rural areas. This paper discusses the selected effects of the CAP implementation in Poland at the background of production and economic situation in the agri-food sector and the most important challenges.

Key words: *agricultural policy, interventionism, CAP implementation effects.*

JEL: *Q18*

Introduction

At present, the global experiences prove that the market and the state have to co-exist and the state intervention should be always limited to support market mechanism and not replacement thereof. The state should interfere only when it has a clear advantage over the market mechanism; hence only when the market fails to protect the general interests of the society [Woś, 1995]. In the agricultural sector the intervention is manifested by state's involvement in the shaping of agricultural prices, awarding different types of investment grants or through the establishment of norms and standards.

The contemporary global economy often rejects the thesis on the perfect market [Czyżewski, 2007] thereby justifying the role of state intervention. When explaining the main reasons for intervention in the modern global agriculture J.E. Stiglitz [Stiglitz, 1987] and J. Wilkin [Wilkin, 2002] point to the high level of risk linked to agricultural activity and lack of

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efficiency as regards prevention of this risk. This risk results from e.g. changing climate conditions, lack of sufficient information and underdevelopment of agribusiness structures, including also consultancy. The need for interventions in the agribusiness sector is justified also by: the phenomena of external costs and effects, low price elasticity of supply, lower level of labour productivity than in other sectors of the national economy, low mobility of the workforce employed in agriculture, the need to provide public goods, implementation of the sustainable development concept.

The CAP constitutes an example of state intervention in the food sector, which among its instruments has market-based instruments (referring to supply and demand regulation) and non-market instruments (direct and indirect grants). The market-based instruments, related to price support, favour the biggest producers, in particular the most productive ones and producers of goods. Thus they fail to meet the criterion of fairness and providing support to the weaker as the reason for intervention [Rembisz, 2010]. The rural development programmes are an example of non-market instruments. As a an instrument of state intervention policy they provide an opportunity to stabilise the policy in several production cycles. They stimulate changes as regards the production structures, competitiveness improvement, environmental protection and multi-functional development of rural areas. Thus they constitute the basic instrument supporting the process of food economy and rural areas modernisation.

Current and future assumptions of the agricultural policy in Poland

The agricultural policy in Poland does not have a cohesive character. It supports agriculture based on the traditional and industrial model, organic farming and agriculture based on induced development and sustainable development [Woś, 2004]. The CAP objectives and mechanisms, as well as individual farms characteristics of the Polish agriculture indicate that in a long-run its pattern should be based on a dual model. Certain farms while maintaining the basic requirements of environmental protection should implement production methods ensuring high economic viability (industrial agriculture), other farms should base their development on methods more ecosystem friendly, which enable the use of the environmental and social and cultural assets at hand as socially sustainable agriculture [Woś A., 2004, Zegar J. St. 2002].

The integration with the EU created new conditions in Poland for the development of agriculture and food industry. Since 2002 the food economy has been supported with the resources of programmes co-financed from the EU budget that penetrate and complement each other. The total value of financial aid programmes (together with direct payments) for the agri-food sector and rural areas from the beginning of 2002 until the end of 2011

exceeded PLN 113 billion[3]. This comprises of SAPARD[4] payments - ca. PLN 4.5 billion[5], SOP "Agriculture"[6] - ca. PLN 6.4 billion, RDP[7] 2004-2006 – ca. PLN 11.1 billion[8], RDP 2007-2013 – PLN 27.5 billion[9] and almost PLN 63.5 billion from direct payments.

The above-mentioned programmes are characterised by certain continuity of general objectives, at the same time, gradually extending the forms of aid and changing the scope and value of provided support. The SAPARD programme aimed at preparing the Polish agri-food sector to the accession, especially as regards the adjustments to the sanitary, hygienic and environmental protection requirements of the EU. After 2004 the strategic objectives of the agricultural policy cover: competitiveness improvement of the agri-food sector, sustainable development of rural areas, improvement of the state of the natural environment, improvement of the quality of life and diversification of the economy on rural areas. The majority of measures implemented in 2007-2013 is a continuation of measures implemented in the previous periods. This is an evidence of policy continuity as regards implementation of the set objectives, but it does not mean that the very agricultural policy is cohesive in the long-term perspective. Because of the multiplicity of measures and objectives some of them are mutually exclusive and cancel each other out.

In the future innovations will remain the main sources of economic growth and competitive advantage generation. Their establishment and generation constitute an important growth factor for quality and efficiency. Although the competitiveness of the Polish agri-food sector can be assessed as rather high, it the long-term perspective its low innovativeness [Szczepaniak, 2009] can pose a significant threat not only to the improvement of the competitive position, but also to keeping thereof. The agricultural policy should prioritise measures strengthening competitiveness and innovativeness of the agri-food sector. These measures gain even greater importance if we look at them through the prism of the forecasted global population growth (and thereby also demand for food) and natural constraints (especially as regards fresh water supply).

Sustainability and multi-functionality will also form important priorities of development in the future . This pertains to mobilisation of economic and social activity of rural residents, differentiation of activity to ensure alternative sources of income, shaping agricultural production patterns in line with the environmental requirements

3 All financial information concerning the implementation of programs financed by the EU are derived from monitoring data the Agency for Restructuring and Modernization of Agriculture, www.armir.gov.pl

4 Special Accession Program for Agriculture and Rural Development - SAPARD

5 The amount covers PLN 468 million of payments financed from the RDP 2004-2006.

6 Sectorial Operational Program "Restructuring and Modernization of the Food Sector and Rural Development 2004-2006"

7 Rural Development Plan

8 The amount does not cover payments from the SAPARD commitments and the payments of commitments moved to be financed from RDP 2007-2013

9 Together with the commitments of the RDP 2004-2006 - ca. PLN 9.2 billion.

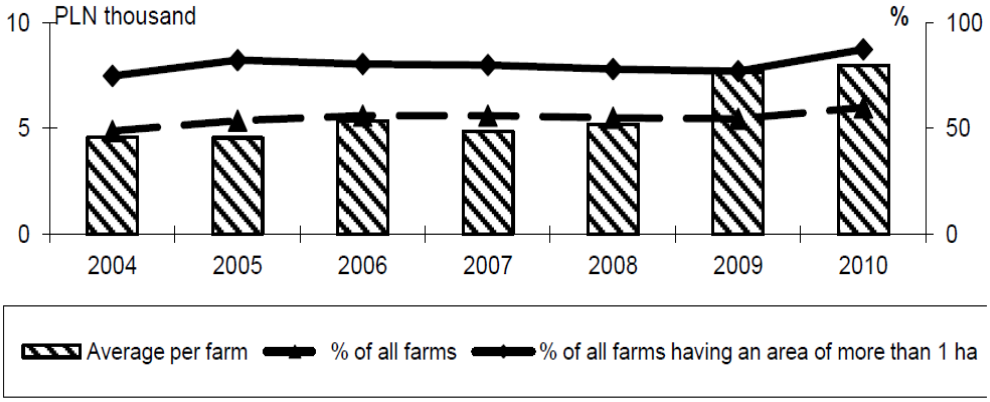
simultaneously keeping the landscape assets and biodiversity. We should aim at improvement of the life quality of rural residents, decreasing the unemployment and eliminating areas of social exclusion. Cohesion in three dimensions: economic, social and territorial, constitutes a key to sustainable.

Direct effects of the CAP implementation in agriculture

The EU funds had a significant share in the financing of transformations in agriculture until Poland's accession to the EU. The direct payments are the most common type of support, each year about 1.4 million of farmers uses this form of support. The value of payments in the 2004-2011 period increased from ca. PLN 6 billion to PLN 14 billion per year. When calculated per one farm it reaches an average of ca. PLN 9 thousand, and this form of support is used by 87% of farms having an area of more than 1 ha (see Fig. 1). An equally important source of income (regardless of production, and only based on the farm's location) are payments for less-favoured areas (LFA). Each year these payments benefit ca. 700 thousand farmers, i.e. half of those receiving direct payments. The land surface covered with LFA payments amounts to ca. 6.9 million ha.

The share of direct payments in the farms' income amounts to ca. 40% [Floriańczyk Z., 2006). If we consider also other forms of direct payments, such as e.g. livestock payments or LFA, this share will be even greater. These payments are made to farmers on an annual basis. The manner of spending of the resources is not subject to settlement. Smaller farms usually allocate the granted payments to current needs and means of production (fuel, fertilisers), while the bigger ones also make investments.

Figure 1. Direct payments - amount of payments and share in the number of farms



Source: Authors' own compilation based on the data of the Central Statistical Office (CSO) and the Agency for Restructuring and Modernisation of Agriculture (ARMA).

The resources earmarked for investments are also an important source of aid for farms. In order to obtain them a farm has to prepare a business plan and gain its acceptance from a body managing the programme. So far, the financial resources for investments in farms available under SAPARD, SOP "Agriculture", RDP 2004-2006 and RDP

2007-2013 were used in their entirety. By 2002 a total of 15% of farms benefited from measures aimed at improvement of competitiveness of farms (see Table 1). The greatest share, i.e. 6% benefited from measure "Modernisation of agricultural holdings", 5% from "Early retirement", 2.7% from "Setting up of young farmers" and 1.3% from "Diversification of agricultural activities". The value of grants is rather considerable (see Table 1), and in the current RDP 2007-2013 their average value as calculated per one beneficiary is even higher. In measure "Modernisation of agricultural holdings" it exceeded PLN 140 thousand, in measure "Diversification of agricultural activities" - PLN 84 thousand, and in "Setting up of young farmers" - PLN 66 thousand.

Due to covering farms with the CAP mechanisms most farmers have seen a rise in their income. The grants (mainly in the form of direct payments) were of basic significance for the rise in the income of farmers. In real terms the income from production factors per a person employed in the Polish agriculture full-time, increased in 2005-2010 by over 45%, and for the overall agriculture in EU-27 by 11.1%. The growth rate of income in family holdings of farmers was higher than in other socio-economic groups. The real income at the disposal of framers increased by 64.3%, while in total by 38.7% [Floriańczyk Z., Goraj L., Zegar J, 2011].

Table 1. Selected results of measures implementation under SAPARD, RDP 2004-2006, SOP "Agriculture" and RDP 2007-2013 in total

Measure	Beneficiaries	Resources paid in PLN million	% of farms in total	Amount of support per 1 beneficiary
Modernisation of agricultural holdings	80,794	7,188	5.95	88,967
Setting up of young farmers	42,310	1,736	2.71	41,030
Early retirements	73,924	7,136	4.73	96,531
Diversification of agricultural activities	17,846	1,136	1.34	63,656
Total	214,874	17,196	14.73	80,028

Source: Authors' own compilation based on the data of the CSO and the ARMA.

An improvement of competitiveness in agriculture depends on structural changes (that predetermine the efficiency of production factors used) and on development of the entire national economy, especially in the context of capacities to create new jobs outside of. The rural development programmes, direct payments and changes in the entire economy accelerated structural transformations in agriculture, which consisted e.g. in concentration of production. This is evidenced by over 20% drop in the number of farms in 2000-2010, the greatest decrease, i.e. 25% pertained to the smallest farms in respect to area (1-5 ha UAA), while the number of the largest farms increased significantly. The average area of a farm (having UAA > 1 ha) increased by 13% ha, i.e. up to ca. 9.5 ha UAA. However, the greatest part of agricultural land still belongs

to the small and medium-sized farms (having < 20 ha UAA), and the distance between Poland and the main food producers in Europe remains huge in this field.

Direct effects of the CAP implementation in food sector

The period of Poland's membership in the EU for food industry is related to production, investment and trade recovery. The industrial food production in 2004-2010 developed at an average rate of 4.6% per year (6.3% up to 2007). This growth rate is slightly higher than the GDP increase (4%), and almost twofold faster than the commercial production of agriculture (2.5% per year), 2.5 times higher than the increase in the consumption of food, beverages and tobacco products (1.7%) and slightly smaller than the growth rate for industrial production in Poland (5.6%). At the same time, the growth rate of the value of food industry sales in Poland was among the highest in the EU (0.7% per year in the EU-27 countries). These changes helped to strengthen the Polish position on the European market. The production value of the food sector in Poland (ca. EUR 67 billion according to the Purchasing Power Parity of currencies) amounts to ca. 7% of the food and beverage production in the EU-27 countries. The fact that Polish food industry is an important partner and competitor for the EU producers of food and beverage producers is evidenced also by comparison with other indicators, such as: employment (in Poland - 458 thousand persons, i.e. 10.6% of EU-27 employment); value added (in Poland - EUR 9.4 billion, i.e. ca. 7.0% of the EU-27 level); total number of companies with the micro-enterprises sector (in Poland - 15.6 thousand, i.e. 5.0% of companies in the EU-27 countries).

The changes result in the branch consolidation. In 2000-2010 the number of active food industry plants producing food and beverages was gradually decreasing (by ca. 30%). The greatest decrease in the number of companies was noted in the micro-enterprises sector (by 36%), and the lowest among small and medium-sized companies (13% in each group). At the same time (although on a smaller scale), a drop was noted in employment (by ca. 10%). The greatest decrease of employment concerned micro-enterprises (by 22%), and in the sector of small companies the reduction was minimal or even showed an increasing tendency in some periods (in 2003-2008).

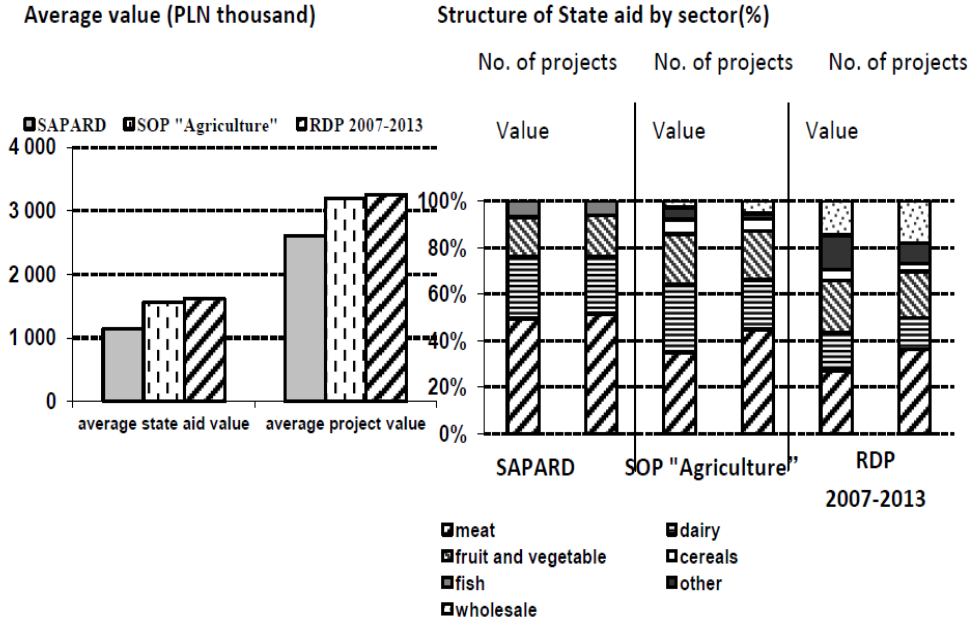
The privatisation of the food processing industry sector, structural changes as well as investments in modernisation and adjustment of the processing plants to the EU veterinary and sanitary norms and standards are the sources of their success on the domestic and foreign markets. The total value of investments in 2000-2010 exceeded PLN 68.5 billion. However, the share of the EU aid resources in this amount is slight and totals PLN 3.8 billion[10], and by the end of 2013 the value of payments will reach ca. PLN 7 billion. The EU financial resources are still a catalyst for investments. In order to obtain co-financing an entrepreneur has to launch his own resources which, consequently, increases the final value of investment by three-four times.

10 PLN 4.1 billion up to October 2011

In 2011 grants were used by almost all food industry branches (including wholesale trade), but the main aid beneficiaries are still: meat, dairy, and fruit and vegetable sectors. The value of co-financing calculated per one investment project ranged from PLN 1 million to PLN 1.5 million (see Fig. 2). From lunching of the SAPARD programme to the end of June 2011 almost 3.5 thousand investment projects were implemented in over 2.1 thousand processing plants. The aid effects as measured with the indicator of company's survival on the market are more than satisfactory. The majority of entities that benefited from the EU aid still conduct production activity.

More than 40% of companies benefiting from the investment aid are medium-sized companies employing from 50 to 249 workers. In the 2002-2006 period the investment focused mainly on adjustments to the EU sanitary and veterinary requirements (ca. 80% of the investment value in the meat and dairy industry) In 2004-2008 the majority of investments (45% of their value) concerned improvement of the production quality and bringing new products to the market, while in the 2007-2013 programme they focus, above all, on value added growth (45% of the value) and bringing new products to the market. Such a change in the type of investments is an evidence of giving preference by the processing plants to measures increasing their competiveness. Environmental investments have marginal character.

Figure 2. Average value of grants and state aid structure



Source: Authors' own compilation based on the ARMA data.

State aid plays a significant, but less and less prominent role in the shaping of the pace and direction of investments in the food industry. Undoubtedly, it helped to strengthen the competitive position and increase export in the Polish food sector. The EU countries are

the largest outlet market of Polish agri-food products (an increase from 63% of the total export value in 2003 to ca. 80% in 2010). From the moment Poland became a member of the EU the Polish export of agri-food products grew by almost 3.5 times, import – by three times and foreign trade balance for these products by over 5 times. This resulted in a positive increase in the trade balance from EUR 0.5 billion in 2003 to EUR 2.6 billion in 2010. The structure of foreign trade in agri-good products is predominated by food industry products. The results of trade in these products have a decisive impact on the trade surplus generation. The share of intermediate products and ready products in the export shows a growing tendency. In 2010 the income on their sales constituted 84% of the Polish export of agri-food sector. For comparison, the share of processed products in the agri-food import amounts to ca. 70% of the trade value).

Conclusion

In the last decade the structural changes taking place in the Polish agriculture, food industry and rural areas became more dynamic. The most important among them cover: a drop in the number of farms with simultaneous growth in the share of the largest farms, which directly influences the increase in the average area of farms, drop in employment in agriculture and progressing production concentration and specialisation. The structural changes are, however, slow and cannot be efficiently accelerated due to non-agricultural circumstances.

In the food industry the investment boom started in 2003 and it was related to the need to modernise and adjust the Polish food businesses to the sanitary, veterinary, animal welfare and environmental standards of the EU. The investments made in the first period of membership in the EU enabled mandatory popularisation of quality management systems guaranteeing food safety. In 2008-2009 the investment expenditure were constrained, however, already in the next year first signs of the boom returning to this field were visible. Owing to the investments made the Polish food industry is counted among the most-modern in Europe and our companies can efficiently compete with producers from other EU countries.

The EU aid programmes made it possible to modernise several farms and processing plants, improve food safety and quality, increase the value added and innovation of production, as well as improve competitiveness on the international markets. The changes in agriculture and food industry do not follow only from covering Poland with the CAP, but also from the change in the market conditions. The impact of individual instruments is different. Starting from the greatest - direct payments, and ending with the slight significance of programmes supporting semi-subsistence farms or early retirement (minimal range).

The future agricultural development strategy should consider the process of farms polarisation into agricultural and non-agricultural activity. This polarisation concerns population, households and economic entities (including farms) operating on rural areas. The tendency of different areas of economic activity interpenetration becomes more and more intense. Support to economic development of rural areas provided in the form of public resources should be based on ensuring implementation of the concept

on shaping internal balance of these areas. It consists in maximisation of net benefits from economic development, at the same time, protecting the natural resources and ensuring restoration of the natural resources services in the long-term perspective - the sustainable development concept.

The debate ongoing on the EU forum and concerning the future of the CAP after 2013 indicates that this policy will play a key role in ensuring food safety, sustainable development of agriculture and rural areas, as well as natural resources management. It will be oriented at new Community challenges, for instance, related to: resources protection, climate change, water resources management, biodiversity, renewable energy or risk and crisis management. Still, food safety will remain the key challenge for the food sector not only in the EU, but all over the world. By 2050 global population figures will grow up to 9 billion making it necessary to increase food production by 70%, while the availability of scarce resources, particularly water, energy and land will be limited. This implies a growing pressure of the global markets on increasing the food production, risk of price fluctuations on agri-food markets, greater pressure on the natural resources. Food, just like in the past centuries will be of strategic significance. The future agriculture in Poland should take into account the aforementioned challenges.

However, in the future state aid should play a less significant role in the shaping of the pace and direction of investments. The state taking over the role of the regulator will force specific patterns of behaviour on economic entities. The beneficiaries using public funds will, by definition, be in a more favourable position as compared to those who do not obtain such grants. Bur the resulting substitution and income effects can cause a drop in efficiency and thereby competitiveness in the long-term perspective.

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Prikaz monografije

RAZVOJNI ASPEKTI TURISTIČKE DELATNOSTI

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Monografija „Razvojni aspekti turističke delatnosti“ predstavlja multidisciplinarni rad koji razvoj turizma kao delatnosti analizira sa aspekta tri naučne discipline, i to menadžmenta, marketinga i ekonomije. Takav originalni pristup razmatranju problema omogućilo je iskustvo akumulirano dugodišnjim radom i istraživanjima autora u ovoj oblasti, sada pretočeno u jedno novo izdavačko osveženje koje je po sadržaju, načinu izlaganja materije, aktuelnosti i praktičnom značaju u potpunosti naučno i društveno opravdano. Zato će ova knjiga osim stručnoj javnosti korisno poslužiti i širem krugu privrednika iz oblasti turizma, pa i menadžmenta, ekonomije i marketinga, odnosno svima koji se poslovno bave turizmom.

Na dvestatridesetsedam strana teksta, sa preko stoosamdeset jedinica izvoda, u okviru sedam poglavlja, koja su svako po sebi celina ali istovremeno i delovi integrisani u zaokruženi kompleks naslovne teme, knjiga daje pregled kompletnog ciklusa razvoja turističke delatnosti: od definisanja specifičnosti turističkog privređivanja, preko tehnika poslovanja, održivog razvoja, planiranja, organizovanja i rukovođenja, pa sve do upravljanja kvalitetom turističkih usluga.

Autori na veoma koncizan i razumljiv način razmatraju esencijalna pitanja i probleme vezane za turizam kao sistem. Da bi čitaoca uveli u problematiku planiranja razvoja u sektoru turizma autori počinju definisanjem osnovnih elementata i pojmova u turističkom privređivanju. Objašnjavaju specifičnosti ponude i tražnje u turizmu, pojam turističke destinacije, prirodne potencijale koji su značajni za razvoj turizma, ekonomske efekte i značaj marketinga i istraživanja u održivom razvoju turizma. Zatim se logički nadovezuje drugo poglavlje u kom autori ističu značaj postojanja turističkih agencija kao posredničkog faktora između ponuđača i korisnika turističkih usluga. U ovom poglavlju čitaoci se mogu upoznati i sa uslovima osnivanja i poslovanja jedne turističke organizacije. Osim toga, autori

daju pregled osnovnih uslova koje agencije stavljaju pred korisnike svojih usluga, kao i njihove međusobne obaveze u poslovanju što ovu knjigu preporučuje veoma širokom krugu čitalaca. Poglavlje o održivom razvoju turizma stvara kontinuitet i logičnu vezu sa narednim poglavljem koje se tiče upravljanja u turističkoj delatnosti.

Centralno mesto u monografiji zauzima upravo poglavlje o upravljanju. Menadžment je univerzalna aktivnost jer su njegovi principi primenjivi u svim ekonomskim, kao i segmentima društva. Na početku poglavlja daje se kratak istorijski pregled razvoja teorije organizacije a zatim se jasno razdvajaju osnovni elementi menadžmenta: planiranje, organizovanje, rukovođenje i kontrola o kojima se detaljno diskutuje. Jasno je ukazano na značaj poslovnog planiranja kao kontinuiranog procesa prisutanog u svim fazama poslovanja, gde ujedno služi kao parametar ostvarenom i planiranom poslovanju i analizi poslovnog uspeha. U ovom delu knjige dati su praktični primeri izrade biznis plana poslovanja, tehnike planiranja, kao i najčešće greške koje se prave u procesu planiranja. Druga faza menadžmenta jeste organizovanje i ono je predmet detaljne analize. Organizovanje u turizmu autori posmatraju sa dva nivoa: organizovanje strukture menadžmenta i organizovanje turističke privrede. Uspešno ocenjivanje uslova za razvoj turizma kao privredne grane na državnom ili regionalnom nivou autori vide u šest osnovnih kriterijuma (ili koraka) čiji je cilj da obezbedede stvaranje turističkog koncetpa sa elementima progresivnog rasata, što i jeste suština menadžmenta. Rukovođenje se razmatra sa aspekta radne organizacije te su autori akcenat stavili na značaj ljudskog resursa i stilove upravljanja u organizaciji. Na kraju poglavlja o menadžmentu autori diskutuju o značaju sprovođenja konrole nad planiranim akcijama.

Peto poglavlje daje poglede autora na regionalni i lokalni razvoj turizma u Srbiji kroz različite koncepte i modele, gde je naglasak stavljen na stvaranje strateškog razvojnog programa. Šesto poglavlje posvećeno je definisanju i izboru optimalne strategije održivog razvoja turizma i značaju stateškog upravljanja turističkim resursima. Na kraju je dato poglavlje o kvalitetu turističkih usluga sa definisanjem dimenzije kvaliteta, oblikovanjem kvaliteta usluga i značaju upravljanja i kontrolom nad tim kvalitetima.

Može se zaključiti da je u ovoj monografiji uspešno izučavana veoma aktuelna tema sa jednog novog stanovišta, obuhvatanjem bitnih faktora i segmenata razvoja turizma. Na osnovu prikazanih dosadašnjih saznanja, sopstvenih i literaturnih, utvrđeni su svi činioci progresivnog a istovremeno i održivog razvoja turizma.

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Monograph review

ROLE OF MARKETING TOURISM IN DANUBE REGION IN REPUBLIC OF SERBIA

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Publisher:
Institute of Agricultural Economics, Belgrade, 2012

Editor:
Prof. dr Drago Cvijanović, director

The monograph "*Role of Marketing Tourism in Danube Region in Republic of Serbia*" was published by a renowned scientific-research institution, the Institute of Agricultural Economics Belgrade, 2012. The monograph is a part of the research results at the project III – 46006 "*Sustainable agriculture and rural development in terms of strategic goals implementation of the Republic of Serbia within the Danube region*" funded by Ministry of Education and Science of Republic of Serbia.

The monograph represents a significant contribution in the field of marketing tourism, because it defined conceptual framework for successful positioning and differentiation of tourism products in the region. The authors approach the problem from a theoretical-methodological and practical point of view, offering their insights and solutions.

The monograph was structured in fourteenth chapters. In the first chapter authors explain nature of marketing, gave basic definition of marketing concept, explain role of marketing in service industry. They put special attention to a concept of marketing mix in service industry. At the end of chapter they gave definition of tourism and made connection between marketing and tourism.

In the second chapters is explained micro and macro marketing environment from view of tourism (tourism companies and tourist destinations). The third chapter dealing with the issue of understanding consumer behavior and consumer as tourists. In fourth and fifth chapters authors define process of marketing research and explained need for marketing segmentation, process of making brends. They put special attention on process of making market position and targeting tourist product.

In the remaining seven chapters, authors of the monograph explain in detail each of the tools of marketing mix (product, service, pricing, promotion, sales, and marketing communications

processes). Twelfth chapter is the basis for formulating marketing strategies and plans. It is also a milestone for the practical application of theory to practice.

Thirteenth chapter presents the application of the concept of marketing and management at tourist destinations. Tourist destination with its characteristics represent specific area which need special approach for implementig marketing. The reason lies in the fact that it is viewed from the macro level and the intention is to implement all the marketing instruments and marketing tools from micro levels.

The fourteenth chapter deals with the practical application of theoretical knowledge. Authors put into focus Danube region in the Republic of Serbia. Area is divided into three parts: upper, lower and metropolitan area. They are described in detail tourism resources as well as methods for their market valuation. Throughout all the process the emphasis is on marketing approach. On this way, the reader gets a complete picture of the theory and practice – way how it is possible to make connection between theory and practice.

The issue of marketing in tourism is set as the key to linking the tourism and travel with a demand from the other side. The role of marketing and is precisely to allow easier exchange process. In this way, it highlights the role and importance of marketing in tourism, which can and must have both, today and in the future.

In order marketing in tourism effectively put into practice, based on the current performance in the development of tourism in the Republic of Serbia and the Danube region, the general conclusion of the monograph is tantamount to the statement that the use of the comparative advantages of the Danube region has, the necessary process of transformation of the economy and in all forms of business tourism.

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IN MEMORIAM

Prof. dr Jeremija Simić

(14.05.1933. – 27.05.2012.)

Krajem maja 2012. godine, potrešeni smo vešću da je iznenada preminuo dr Jeremija Simić, redovni profesor Poljoprivrednog fakulteta u Beogradu i dugogodišnji šef Katedre opšte ekonomske teorije i sociologije. Za rodbinu, kolege sa studija i posla, toga dana preminuo je Ješa, a za nas njegove studente i mlađe kolege preminuo je profesor Simić.

Životni put prof. Simića bio je težak i trnovit. Rođen je 1933. godine u selu Obajgora kod Bajine Bašte. Rano je ostao bez oba roditelja pa je kao najstariji od dece preuzeo brigu o mlađoj braći. Osnovnu školu završio je u Bajinoj Bašti, srednju u Šapcu, a studije na Poljoprivrednom fakultetu u Beogradu, gde je i započeo svoj pedagoški i naučno-istraživački rad. Na istom fakultetu magistrirao je 1965., a doktorirao 1972. godine.

Od početka studija pokazao je veliko interesovanje, angažovanost i zalaganje. Kao student učestvovao je na 3 omladinske radne akcije (izgradnja autoputa Zagreb-Ljubljana, dela autoputa Niš-Paračin i dela autoputa Niš-Vranje gde je bio odgovoran i za društveno-politički život studentskih brigada).

Svoju profesionalnu i radnu karijeru kao asistent na predmetu Ekonomika poljoprivrede započeo je na Poljoprivrednom fakultetu 1961. godine, a završio kao redovni profesor odlaskom u penziju 2000. godine. U zvanje docenta, na predmetu Ekonomika i privredni sistem SFRJ, izabran je 1974. godine, vanrednog 1980. i redovnog profesora 1985. godine. Do izbora u nastavničko zvanje izvodio je vežbe iz Ekonomike poljoprivrede, Osnovi ekonomije, Sociologije, Političke ekonomije, Privrednog sistema SFRJ i Teorije privrednog razvoja u socijalizmu.

O prof. Simiću kao kao profesoru i naučnom radniku najbolje svedoči Referat za izbor u zvanje redovnog profesora 1985. god, koji su potpisali redovni profesori: Vojislav Rakić, Vladan Jovašević i Petar Marković gde je napisano: „Svojim dosadašnjim naučnim i stručnim radom dao je značajan doprinos i sa teorijskog i sa praktičnog stanovništa, u rasvetljavanju društveno-ekonomskih i drugih pitanja, procesa i kategorija vezanih za društveno-ekonomski razvoj proizvodnih snaga i socijalističkih produkcionih odnosa, naročito u poljoprivredi i agroindusrijskom kompleksu u našoj zemlji".

U svom pedagoško-vaspitnom radu razvio je nove forme aktivnosti (okrugli stolovi na vežbama) uključujući studente u nastavni proces i razvijajući kod njih interes za podizanje kvaliteta studiranja. Dakle, polovinom '80-tih godina prošlog veka, prof. Simić u nastavi sprovodio današnji „Bolonjski proces".

Shvatanje privrednog života i doslednost u prmeni Ustava i ZUR-a, najbolje ilustruje prof. dr Svetozar Livada koji ističe da su Pero i Ješo sa Đerom bili tim koji je našu naučnu i kulturnu spoznaju širio preko časopisa i kroz obuku. Ješa je bio posebno osetljiv na socijalne probleme ljudi. Zvali smo ga ZUR-ovac, jedinstven po svojoj jednostavnosti i radinosti.

Prof. Simić je ostavio neizbrisiv trag kao pedagog, predavač, ispitivač i naučni radnik. Pamtiće ga brojne generacije studenata Agroekonomskog odseka Poljoprivrednog fakulteta u Beogradu, Defektološkog fakulteta u Beogradu, Viših škola u Beogradu, Čačku i Šapcu, i drugih fakulteta i škola na kojima je izvodio predavanja u svojoj dugoj profesorskoj karijeri. Redovno je učestvovao u izvođenju nastave na poslediplomskim studijama Agroekonomskog odseka (predmeti: Ekonomika Jugoslavije i međunarodni ekonomski odnosi, Ekonomija i sociologija udruženog rada u AIK-u, Politička ekonomija - teme iz problematike zemljišne rente i dr). Odžao je veliki broj predavanja polaznicima omladinskih političkih škola po programu marksističkog centra CKSKJ.

Prof. Simić je raspolagao ogromnom stvaralačkom energijom, iskustvom, znanjem i umećem. Bio je vrsni istraživač, naučni radnik, predavač i pedagog. Posejano seme, koje je ostavio u agroekonomskoj nauci i privrednom sistemu, dalo je i bogat rod koji se ogleda u preko 300 objavljenih naučnih i stručnih radova, 2 skripte Ekonomika i privredni sistem SFRJ i Privredni sistem SFRJ, većem broju monografija, studija i projekata ispisanih na više desetina hiljada stranica, učešćem na preko 100 međunarodnih i domaćih kongresa, simpozijuma i drugih naučnih skupova šireći ugled Poljoprivrednog fakulteta i Beogradskog univerziteta u svetu. Kao glavni i odgovorni urednik izdavačke delatnosti u NIRO »Zadruga« publikovao je 50 knjiga iz agrarno-političke i poljoprivredne biblioteke. Kao član izdavačkog odbora Izdavača zadružne štampe, doprineo je publikovanju sabranih dela Kardelja u tri knjige »O poljoprivredi, selu i zadrugarstvu«. Posebno se angažovao u rukovođenju i radu Društva mladih istraživača Poljoprivrednog fakulteta gde su studenti učestvovali u pripremi i izvođenju istraživačkih programa i pisanju svojih prvih naučnih radova. Neki od njih su danas poznati naučni radnici iz oblasti agrarne ekonomije.

Pod mentorstvom prof. Simića preko 200 studenata je uspešno odbranilo diplomske radove, a veći broj naučnih radnika je stekao titule magistra i doktora nauka. Veliki je broj nastavnika

na Agroekonomskom odseku Poljoprivrednog fakulteta u Beogradu kojima je prof. Simić pružao pomoć ili savete pri izradi magistarskih teza i doktorskih disertacija, i to ne samo onima kojima je bio mentor ili član komisije, već i drugima koji su se bavili naučno-istraživačkim radom.

Brojne generacije studenata i saradnika prof. Simića, duguju mu trajnu zahvalnost za stečena znanja i topli roditeljski odnos. Vrata njegove kancelarije na Fakultetu uvek su bila otvorena.

Obavio je nekoliko studijskih boravaka u inostransvu (Pragu, Londonu, Moskvi 2x, Sofiji i dr.).

Kroz razne društveno-političke organe i tela, prof. Simić je od samog početka studija, a kasnije i tokom radne karijere, vrlo aktivno i uspešno učestvovao u radu uprava Instituta, Fakulteta, Univerziteta i drugih Institucija (spomenuću važnije: Direktor instituta za agoekonomiju, Šef odseka za Agroekonomiju, Član Nastavno-naučnog veća Poljoprivrednog fakulteta, Predsednik skupštine Poslovne zajednice za pčelarstvo Jugoslavije, član Agrarnog saveta Ministarstva za poljoprivredu Republike Srbije i dr.,). Za svoj društveno-politički rad dobio je veći broj nagrada i priznanja (Udarničku značku na omladinskoj radnoj akciji, Specijalnu diplomu Saveza Studenata Beogradskog Univerziteta, Povelju Poljoprivrednog fakulteta za doprinos razvoju poljoprivrednih nauka i obrazovanju kadrova i povodom 60-godišnjice KPJ, ukazom predsednika Republike, odlikovan je Ordenom zasluga za narod sa srebrnom zvezdom).

Za prof. Simića odlazak u penziju nije značio i prestanak bavljenja naučno-istraživačkim radom. Naprotiv, do kraja života sa puno energije i interesovanja nastavio je da se bavi pedagoškim i naučno-istraživačkim radom.

Prof. Simić će u sećanjima prijatelja ostati, kao čovjek jedinstvenih ljudskih kvaliteta i sposobnosti. Bio je veoma tražen, poštovan, skroman i blizak ljudima. Zbog toga su ga cenili i voleli. Jednim delom moju asistentsku karijeru ostvarivao sam kao najbliži saradnik prof. Simića. Prema saradnicima se ponašao po Aristotelovom principu »da bi neko bio odgovoran mora mu se prvo verovati«.

Još dugo nećemo ni želeti, ni moći da shvatimo da nas je Ješa zauvek napustio. Ostale su trajne uspomene na njegovu bogatu životnu i radnu biografiju, na njegov uspravan i dostojanstven hod u ovozemaljskom životu. Studentima i kolegama prof. Simića, ostaju sećanja i uspomene na zajednički rad, druženje i čoveka plemenite duše, velikog srca i dobrog prijatelja.

Neka ove skromno napisane reči o životu i delu prof. dr Jeremije Simića budu od pomoći u očuvanju uspomena njegovoj porodici i svima onima koji su ga poznavali.

Večna mu slava i hvala.

U Beogradu, 05.09.2012.

Prof. dr Simo Stevanović
Poljoprivredni fakultet, Beograd

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