UDC 338.43:63

YU ISSN 0352-3462

# ЕКОНОМИКА ПОЉОПРИВРЕДЕ

# ECONOMICS OF AGRICULTURE

СПЕЦИЈАЛНИ БРОЈ / SPECIAL ISSUE - 2

International scientific meeting:

**MULTIFUNCTIONAL AGRICULTURE AND RURAL DEVELOPMENT (V)**

- regional specificities -

***I Book***

**Год./Vol. LVII, СБ/SI-2 (1-656), 2010.**
**БЕОГРАД / BELGRADE**

International scientific meeting:

# MULTIFUNCTIONAL AGRICULTURE AND RURAL DEVELOPMENT (V)

- regional specificities -

Banja Vrujci, 02-03. December 2010.

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**Technical preparation and page breaking:**
Marko Jeločnik, Svetlana Roljević and Vladimir Sokolović

**Printing company:**
DIS PUBLIC D.O.O., Braće Jerković 111-25, Belgrade, phone/faks: 011/39-79-789

**Number of copies:**
300 copies

**UDC 338.43:63** **YU ISSN 0352-3462**

**Publishing of Special issue was completely financed by Ministry of science and technological development of Republic of Serbia**

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SI – 2
UDK: 637.1:658.8 (497.11)

# SOURCES OF PROBLEMS IN MILK SUPPLY CHAIN IN SERBIA AND ITS CONCEQUENCES

*Slobodan Aćimović[1], Jovan Zubović[2], Ivana Domazet[3]*

## Abstract

*This paper is the result of research efforts aimed to identify key problems in the milk supply chain in Serbia. Authors intend to indicate major issues in the Serbian milk market during last three months of summer 2010. In the introductory part of the research authors briefly define supply chain – a network of upstream-downstream links and the values in each chain. That is followed by the structure of the "milk flow" in Serbia, with basic performances of the market and analysis of most important participants in the market. After that we have analyzed causes of problems in the milk supply chain in Serbia, with detailed analysis of key issues related to supply chain structure (participants). Finally, we summarize with the consequences of structural problems in Serbia and provide solutions for them.*
***Key words**: Milk Market, Distribution chain, Serbia*

## Introduction

Supply chain is a network of organizations which includes both upstream and downstream links, involved in various processes and activities that produce added value for products and services distributed to end users or consumers (Rogers, D. and Tibben-Lembke, R., 2005 pp. 11). Supply chains have traditionally been viewed as weakly linked association of companies in certain business sector. The concept of network, being the first pillar of the above definition, indicates the need to introduce coordination of processes and relations among all horizontal and vertical supply chain participants of a certain product.

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Furthermore it is important to identify upstream and downstream connections for every supply chain. Upstream connection is those „against the current“ and refers to the relationship between company and its suppliers as well as suppliers of our suppliers. On the other hand, downstream link or connection "along the current" is relationship between company and its consumers. It is also possible to have combined upstream-downstream connection, for example in companies that sell products with return containers, pallets or products of internal trade. Very important determinant of each supply chain is the value created throughout the process. Porter defines value as "the amount that consumers are willing to pay" (Porter, M., 1985, p. 3.). If the supply chain is an unobstructed flow of goods from raw materials to final consumers, smooth as a production line, then the goal of such a supply system would be creation of greater value to final consumers at reasonable costs (Aćimović 2006 , p. 82).

Specifically, the goal of every supply chain is to maximize its total worth by creating greater value in a single system (assembly line) than it would be created if each participant operated as independent entities (adapted on Chorpa, S. and P. Meindl (2004), p. 6). The value in supply chain can be defined as the difference between the value of the final product to the end consumers and the value of all activities throughout the supply chain, created with a goal of meeting consumer demands.

In that way we can define as a key objective of this paper to analyze milk supply chain in Serbia, identify its supply network including upstream-downstream links, and to determine if it creates added value for all participants in the market. Such an analysis begins with brief overview of "Serbian dairy market.

## Structure of “milk flow” in Serbia

Dairy sector in Serbia had a significant decline in production volume in recent years. The fall of activities resulted in significant reduction of milk cows. Current production is around 1478 million liters of milk per year, which is 327 million liters less than in 1990 and 98 million less than in 2001 (Table 1). There are approximately 200 dairies in Serbia which annually purchase and process over 800 million liters of milk. Out of 1.5 billion liters of milk a year nearly 50 percent is used in subsistence spending. At a time when the number of milk cattle in Serbia declined at a rate of 1.5 to 2 percent, milk production is stabilized to the level of minimum household consumption, which amounts to 107 liters per capita per year (Popović, 2009).

Currently in Serbia there are about one million cattle, out of which 585.000 are milk cows and heifers in calf, which is equal to the number of cattle in 1910. At the same time, with a decreasing number of livestock, the number of mini-dairies is increasing, particularly during intensive privatization in this sector of economy. Such irregularities in Serbian milk supply chain created during last 20 years resulted in reduced availability of resources in primary production, while processing capacity was constantly increasing.

*Table 1 – Indicators of milk market in Serbia*

| Indicator | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|
| Milk cows and heifers in calf (000) | 787 | 752 | 740 | 742 | 721 | 692 | 648 | 624 | 585 |
| Cow milk production (mil l.) | 1576 | 1580 | 1576 | 1579 | 1602 | 1587 | 1549 | 1534 | 1478 |
| Liters per milk cow | 2203 | 2348 | 2345 | 2427 | 2568 | 2645 | 2663 | 2731 | 2877 |
| Milk acquired by dairies (mil. l.) | 601 | 700 | 710 | 761 | 750 | 740 | 814 | 825 | n/a |
| Raw milk price (dinars) | 10.95 | 10.61 | 10.85 | 12.72 | 14.21 | 15.18 | 18.44 | 23.7 | 28.5 |
| Sales of fresh milk (mil. dinars) | n/a | n/a | 4,700 | 5,682 | 8,675 | 10,730 | 12,260 | 17,605 | n/a |

*Source: Ministry of agriculture of Serbia, Statistical office of Serbia: statistical yearbook 2003-2009, communication P012, databases*

Decline of primary production was caused by low milk purchase prices that were significantly lower compared to average of EU countries. As a measure to help manufacturers, government paid premiums for milk sold, which in 2005 amounted to four dinars per liter, but it was been reduced to only 1.5 dinar per liter in 2010. Decision to reduce the premium government argued by the fact that privatized dairies operated profitably, so the share of profit could have been directed towards primary producers (farmers).

This decision had very negative consequences for farmers, especially those who were not registered, because the state allowed premiums only to registered farms. At this point of time in Serbia there are around 180,000 eligible, while the other 600,000 are not eligible for getting state support (not registered farmers). These are mostly small commodity producers with one or two cows per farm. Their milk production is expensive and unprofitable. The latest agreement the Ministry of Agriculture and participants in the milk supply chain in August 2010 regulated that the premium will be paid to all farmers, regardless of whether they are registered or not. This will significantly alleviate previous model which dominantly delivered premiums to milk processors - dairies, and not to primary producers.

Dairies as the participants in the market are gaining substantial advantage from premiums paid to producers (farmers) through them. The state paid annually significant amounts for premiums, but there was no positive financial impact because the money was directed to processors (dairies) instead to producers, which at the end dairies used to simply reduce the purchasing price of milk by the amount of premiums (Rajic, 2007).

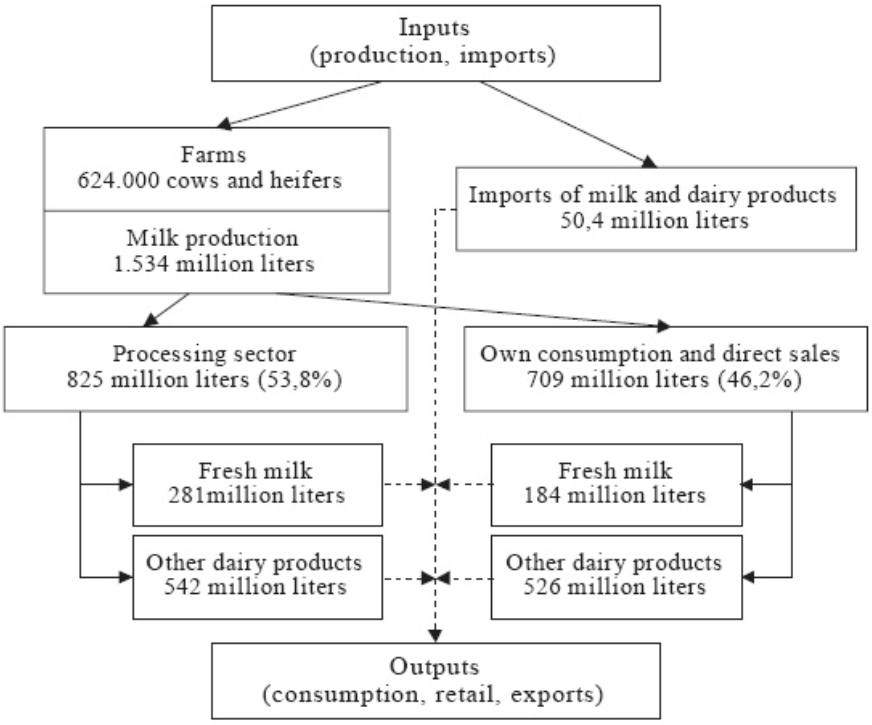
*Table 2 – Yearly volume of milk delivered to dairies in Serbia (2006-2008)*

| Dairy – Company | 2006 | 2007 | 2008 |
|---|---|---|---|
| Danube foods group | 350.374.975 | 361.959.880 | 354.904.468 |
| Mlekara Šabac | 43.187.653 | 56.945.950 | 67.627.936 |
| Somboled | 40.256.713 | 43.665.250 | 52.212.275 |
| Mlekoprodukt | 28.977.976 | 28.720.080 | 27.646.386 |
| Middle dairies* | 126.563.765 | 158.097.080 | 171.970.915 |
| Small dairies** | 150.584.654 | 165.139.540 | 150.736.043 |
| * Middle size dairies have the capacity of 5-20 million liters per year<br>** Mini sized dairies have the capacity of up to 5 million liters per year | | | |

*Source: Adapted on Popović (2009)*

In Serbian market there are a few large milk processors including: Danube food groups (Imlek, Impaz, dairy Zemun, Novi Sad Dairy, Subotica Dairy), Dukat (Somboled), Unimilk (Senta, Pancevo, Kragujevac, Nis and Pirot - in summer 2010 overtaken by Danone), Bongrain (Mlekoprodukt) Farmakom MB (Šabac) and 200 others (small and middle sized) private dairies (Table 2).

*Graph 2 – Chain of "Milk flow" in Serbia in 2008*




*Source: Statistical office of Serbia (2009), Popović (2009)*

Majority of privatized dairies had operated profitably before change of ownership. For that reason they were attractive for sale. Good examples of privatization apart from Salford (Danube food groups - 5 dairies) are Somboled from Sombor bought by Dukat (Lura) and French company Bongrain has overtaken Mlekoprodukt dairy from Zrenjanin for seven million euros. Bongrain and Dukat are viewed as better opportunity for Serbian market since they are originally manufacturing companies, to Salford which is an investment fund. Unimilk which was in 2010 acquired by Danone of France is another example of important foreign investments in this sector in Serbia (Gulan, 2006). Despite findings in other papers (Zubović, Domazet, Kovačević, 2009 and Zubović, Subić, Jeločnik, 2009) of significance of foreign investments in Serbia, in milk market, privatization by foreign capital has brought some negative results.

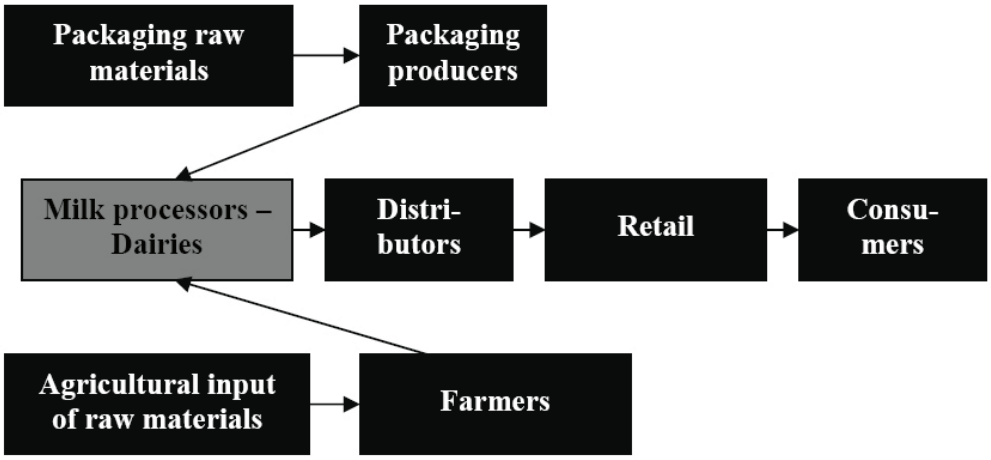
## Sources of problems in milk distribution chain in Serbia

«Milk crisis» in Serbia culminated in summer 2010. The average consumer was left without enough milk on store shelves. At the same time customers were exposed to media "arguments" from all participants in the market trying to offer solution for the problem of milk supply chain, with different answers to why the agro-food production, especially milk production segment, which should be Serbian comparative advantage faced problems on the market.

From a brief review of the milk market in previous section one can see that there are many factors that may cause problems in milk supply in Serbia. Continuous neglecting of primary producers is reflected on reduction of number of cows, state disincentives per liter of milk (reduced premiums). Shift to incentives per cow (instead per liter sold) may have been the initial source of the problem in the supply chain. Although we will not deal with this agricultural and economic problems in this paper, our assessment is that due to frequent changes in agricultural policies of milk production and processing in the last 10 years culminated in 2010 with problems on the market.

How to simply explain why there was not enough milk in major shopping chains in Serbia on September 2010? Does is look like the shortages are at sight again after more than ten years? Based on preliminary results another study (Aćimović 2010) dealing with structural problems in the supply chains in Serbia on the one hand, and knowing the market and the structure of participants in the “milk flow” in Serbia on the other hand, it is easy to identify the key issues in Serbian milk supply chain - structural unequal power relations between participants in the supply chain. In the graph 3 we show milk supply chain in Serbia with highlighted major source of the problem.

*Graph 3 – Key source of problems in milk supply chain in Serbia*




Why have we identified dairies as a key generator of current problems in the supply of milk? Are all dairies problem generators in the same way or are there some manufacturing groups whose negative behavior is particularly "felt" on the milk market?

It is obvious that dairies as producers of the final products are very satisfied with the system of state subsidies. Most of the subsidies are going directly to them, thus allowing them to become a key "player" in the dairy industry (through the system "where the money is there the power is"). In that way dairies have obtained dominant position in the milk supply chain in Serbia. Now we come to define differences between participants in the industry. They imply that not all dairies are willing and able to abuse their dominant position in the supply chain. The abuse of dominant position is primarily immanent to largest manufacturing groups, which have been created, during privatization process of dairy industry in the past few years.

What allows large manufacturing groups to have power on the milk market and disrupt normal supplying network, by breaking primarily upstream links in the supply chain, and to a certain level downstream as well? The answer is known to all those who are aware of the strength of large buyers - purchasing power. What is purchasing (buyer) power? There are many different definitions of purchasing power. Simply put, the power of certain participants in the supply chain is usually reflected on its purchasing capabilities or a privileged position (the state agricultural policy), which in turn derives from a particular strategic advantage (large manufacturing groups). In other words, if a customer is able to obtain more commercial and financial concessions from their suppliers than competitors, then it gains significant strength. Furthermore, the strong "player" with its continuous activities can affect the whole cost side of the market, and even push some of the competitors out of the market.

## Concluding remarks – consequences of the "milk crisis" and how to prevent them?

The most important aspect of any supply chain is its ability to create added value for all participants in the chain. Is there value creation in the milk supply chain in Serbia? Obviously there is, but only for those who predominantly affect the market. All other players in the supply chain have a problem:

- primary producers - for diverting premiums to dairies, but most of all because of low prices of raw milk, which does not cover the cost of production;
- the state – it risks shortages (with the negative political connotations), but with possible long-term significant reduction or even extinction of domestic primary production of milk
- packaging producers (and their suppliers), agricultural inputs manufacturers, distributors, retailers – since they lose sales and profits from milk and dairy products
- final consumers - who are by shortages deprived from one of the basic products in consumption.

It is natural that participants of certain product supply chain have different goals and strengths. The problem arises when in the supply chain a particular participant grows too big. It uses purchasing and selling power on the market (especially in small, relatively unorganized markets such as Serbian is) to disturb all normal relations between the partners. The reason for such behavior is desire for greater profit. Example of this is a Serbian milk market during past years, which culminated in summer 2010. One major group, or its owner - a foreign investment fund, probably unsatisfied with returns on investments, wanted to improve its, already excellent market position. The group, on the one hand tightened its payments to primary producers of milk, and on the other hand has problems with the state, because it is getting obvious that they abuse dominant position on the market. Hence such egocentric behavior of a manufacturing group, as a leader in the milk supply chain in Serbia (with 43% of raw milk supply and about 60% of processing facilities located in 5 major dairies) created a problem in the milk market. Problem of one strong participant in the supply chain is later transferred to other dairies, and their relationship to the supply side and sales.

Manufacturing group, whose owner is not a typical foreign milk producer, but it rather is the investment fund, views no long-term social interest in Serbian agricultural production. We believe that for them there makes no difference if raw milk is purchased in Serbia or from abroad, only what is important is the level of profit. Serbian Government has recognized such behavior at time and it is taking difficult, but proper care to fight for domestic milk production, and the rights of domestic consumers for regular supply of milk.

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Economics of agriculture
SI – 2
UDK: 631(497.7)

# REGIONAL SPECIFICS OF MACEDONIAN AGRICULTURE

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## Abstract

*Macedonia is located on the Southern Continental layer of the moderate and Subtropical zone borders. Geographical location, relief, near the Aegean Sea, the openness of the river to the sea, are giving the possibility of presents of three continental zones with: Mediterranean climate, Continental climate and Mountain climate. Variety of eco conditions as well as geographical position are providing relatively wide assortment of agricultural crops to be grown on the territory of Macedonia. Specific characteristics of certain regions give the specific assortment in a certain areas. The most of agricultural area (25% arable land, orchards an number of cattle) has region of Pelagonia. The biggest agricultural area are under vineyards placed in the South-Eastern region. The analysis shows that the vegetable is represented mostly in the East-Southern region and the region of Skopje. The wheat are represented the most in the region of Pelagonia, while the apple trees are represented with 66,7% in the area of Resen (also in the region of Pelagonia). The last couple of years, except some new types of vegetable crops, in Macedonia has been expanded the production of flowers and take about 30% from total agricultural area in the region of Polog.*

***Key words:*** *regions, agriculture, crops, territory, natural conditions.*

## Introduction

Modern economic development in general, and particularly agriculture, dedicate a great attention to regionalization, because of the relatively large difference levels of development of certain regions over others or in relation to the average values of economy of the country, as well as opportunities and a better insight into the potential use of certain

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regions, but also the orientation of the economy poorly developed regions, greater financial and other assistance to the state.

Republic of Macedonia was officially divided into eight regions, each with certain specific features as these are the geographic regions with different natural conditions in a region where not great natural difference. Some of the regions referred to as the economic, as well as other statistics, and in fact have both, because it keeps official statistics at the municipal level, and each region consists of a number of municipalities as a whole.

Although relatively small in territory, Macedonia, under the influence of climate and terrain there are formed relatively differentiated natural conditions, which allow for successful breeding of a wide range of agricultural crops of all so-called Continental to Mediterranean and those which are grown in mountainous conditions.

Macedonian agriculture is a very important economic sector, which has been poorly developed because of the relatively weak industry and services, participate very high (compared with developed countries) in gross domestic product with 10.96%. Some regions in the GDP from agriculture involved very different, from: 1.6% in the region of Skopje, where they concentrated on other economic sectors, and up to 41.8% in the South-eastern region with areas of Strumica, Valandovo, Gjevgjelija, where they represented an intensive agricultural systems, such as vegetable growing and vineyards.

## Data sources

Largest source of data derived from census of agriculture in Macedonia in 2007, which includes all municipalities, and the data processed at the level of region. Then we used statistics from the Bulletin no. 621 – Field production, Orchard and Vineyard production, and publication of the National Bureau of Statistics under the heading: "Regions of the Republic of Macedonia in 2009".

The data in these sources are usually represented as absolute indicators, we have calculated in relative ratio to the needs of this work, according to the conception of the author.

## Indicators of the capacity region

Regions with large mutual differences on many indicators: by territory (area) the largest is the region of Pelagonija, by number of inhabitants the largest is the region of Skopje, by density after Skopje, with the most densely population is the region of Polog etc.

*Table 1 - Some important indicators of the region, 2009*

| Regions | Area, 000 km² | Number of inhabitants 000 | Population density inhabitants / km² | Number of municipalities | Number of municipalities residence in the village |
|---|---|---|---|---|---|
| Pelagonija | 4,7 | 236 | 50 | 9 | 4 |
| Vardar | 4 | 154 | 38 | 9 | 4 |
| North-eastern | 2,3 | 174 | 75 | 6 | 3 |
| South-western | 3,3 | 222 | 66 | 13 | 8 |
| Skopje | 1,8 | 590 | 319 | 17 | 7 |
| South-eastern | 2,7 | 172 | 63 | 10 | 5 |
| Polog | 2,3 | 310 | 126 | 9 | 7 |
| Eastern | 3,5 | 181 | 51 | 11 | 3 |

The number of municipalities that are within the region ranges is from 9 to 17 municipalities, and nearly half of the total 84 municipalities are located in villages. As for the relationship of rural and urban residents, it was: 43.3% rural population and 56.7% urban population, but 43.3% of residents who live in villages, about 11% at the level of Macedonia is an agricultural population.

**Participation in major regional capacity**

As the level of the overall economy, as well as in agriculture, distribution, manufacturing capacity with large differences by region. This has resulted in uneven development and the large differences which can be seen from the actual share of GDP by region in total GDP, which is from 6,5% in the Eastern region to participate with 48.5% in the region of Skopje.

So far almost nothing specifically does not happen in Macedonia, both at the level of the overall economy and in agriculture to reduce differences in development.

Disposal of larger facilities does not always mean better results, so it is important how the facilities used by or for agriculture in general, that the agricultural sectors of agricultural area used (Tab.2). The region of Pelagonija has the largest agricultural areas, which means arable land, orchards, meadows and pastures, but with a relatively small part in the vineyards available. Usage of agricultural land, to be anticipated in the global view in which the region the most exponent individual products. So it is obvious that the vineyards in the region of Vardar are the most exponent (Kavadarci, Negotino), that the growing fruit is with the highest participation in the region of Pelagonija, because Resen belongs to, etc.

*Table 2 - Regional participation in the management of agricultural land (census of agriculture, 2007) %*

| Regions | Agri-cultural land | Plough-land &Gardens | Orchards | Vineyards | Meadows | Pastures |
|---|---|---|---|---|---|---|
| Pelagonija | 25,5 | 22,6 | 28,1 | 5,4 | 23,4 | 28,1 |
| Vardar | 10,2 | 10,4 | 6 | 44 | 2,5 | 9,5 |
| North-eastern | 13,6 | 15,2 | 6,9 | 7,2 | 19.0 | 12,3 |
| South-western | 9,7 | 9,6 | 15,8 | 2,8 | 12,2 | 9,7 |
| Skopje | 6,2 | 7,5 | 5 | 9,3 | 6,6 | 4,9 |
| South-eastern | 8,5 | 11,6 | 7 | 23,4 | 3,6 | 6,2 |
| Polog | 15,9 | 7,4 | 8,3 | 0,2 | 19,4 | 23,1 |
| Eastern | 10,7 | 15,7 | 22,9 | 7,7 | 13,3 | 6,2 |
| **Total** | **100** | **100** | **100** | **100** | **100** | **100** |

As for the number of livestock (Tab.3), as one of the basic capacity in agriculture, the differences are relatively small in cattle except between Pelagonija with the highest share of 21.2% and the region of Vardar with 4.8%.
In the case of sheep, the highest share has Eastern region, as well as involvement of the goats despite the low share of available pasture.

*Tab.3 Regional participation of livestock (census of agriculture, 2007), %*

| Regions | Cattle | Sheep | Goats | Pigs | Poultry |
|---|---|---|---|---|---|
| Pelagonija | 21,2 | 17,5 | 8,4 | 12,7 | 20,3 |
| Vardar | 4,8 | 8,5 | 7,2 | 3,9 | 6,8 |
| North-eastern | 12,6 | 9,6 | 14,6 | 16 | 15,3 |
| South-western | 9,8 | 13,8 | 10,2 | 5,9 | 8,4 |
| Skopje | 10,3 | 5,7 | 6,3 | 6,4 | 5,6 |
| South-eastern | 10,8 | 9 | 18,9 | 9 | 19,1 |
| Polog | 18,3 | 12,5 | 6 | 7,1 | 12,1 |
| Eastern | 12,2 | 23,4 | 28,4 | 39 | 12,4 |
| **Total** | **100** | **100** | **100** | **100** | **100** |

An important requirement for agricultural production is available tractors, as the most important part of the mechanization of agriculture. Because of the relatively small holdings of individual farmers in Macedonia, for a long time shows irrational used of the tractors. So, now average size of agricultural land per tractor is 4.4 ha, the smallest in the region of Polog with only 2.7 ha, in the region of Skopje with 2.9 ha, and the largest in the North-eastern region with 5.7 ha, than, in the Eastern region with 5.6 ha, in the region of Pelagonija with 5.5 ha and in the region of Vardar with 5.4 ha.

Of the total number of individual farms, the largest percentage of has the Eastern region 16.8%, minimum of has region Skopje and the Vardar region of 9.8%. Of the

total number of "business subjects" (as appointed by stats) also the highest number is in the Eastern region, at least in the region of Skopje. Pulverous surface show data in all regions over both agricultural land per farm. Thus, at the level of Macedonia, a farm has only 1.67 ha of individual farmers, and 257.3 ha per business entity. The largest area per farm is North-eastern region of 2.38 ha, and in business subjects the region of Pelagonija from 423.0 ha in one subject.

**The participation of the region in the use of arable land and garden**

The largest area of arable land and garden (25%) belong to the region of Pelagonija that includes Pelagonija, relatively the largest plain in Macedonia, then the Eastern region, where are the plain part of the Ovce Pole and Kočansko Pole, while the lowest participation have South-western region (which belong to the Ohrid and Kičevo, 5.3%) and the region of Vardar (Kavadarci and Negotino with 6.2%).

From this information can be finding out which confirm the data by region in the areas of participation by group of crops. Shows that dominate the area under wheat in Pelagonia and Ovce Pole (Eastern region).

Then the industrial crops with the greatest participation also in the region of Pelagonija (tobacco in Prilep's field and sunflower in Bitola's field), but as well with high participation in the South-eastern region dominated by tobacco (Strumica and Radovish). In recent years, except tobacco, which shows a trend of increase and the sunflower, whose surfaces are very low, other industrial culture have a symbolic representation of the structure of sowing (poppy and sugar beet) or disappeared (cotton and sesame).

*Tab.4 Share of the region in the use of arable land and garden (census of agriculture, 2007), %*

| Regions | Total area of using surface | Used method of using surface | | | | |
|---|---|---|---|---|---|---|
| | | Grain | Industrial crops | Fodder | Vegetables | Flowers and ornamental plants |
| Pelagonija | 25,2 | 24,2 | 57,7 | 20,2 | 13,3 | 9,7 |
| Vardar | 6,2 | 5,3 | 4,3 | 4,2 | 6,2 | 7,9 |
| North-eastern | 14,9 | 18,2 | 3,5 | 8,3 | 9,2 | 5,3 |
| South-western | 5,3 | 5,2 | 0,2 | 12,9 | 4,3 | 9,8 |
| Skopje | 8,2 | 7,6 | 3,4 | 9,5 | 14,1 | 13,7 |
| South-eastern | 12,5 | 8,6 | 22,9 | 15,5 | 29,5 | 15,6 |
| Polog | 8 | 7,7 | 0,5 | 17,2 | 9,1 | 30,1 |
| Eastern | 19,7 | 23,2 | 7,5 | 12,2 | 14,3 | 7,9 |
| **Total** | **100** | **100** | **100** | **100** | **100** | **100** |

The region of Pelagonija has the highest participation and the surface forage crops because of the relatively high representation of livestock-mostly cattle, while other

regions have generally forage crops represented by participation in the total number of cattle. The South-eastern region has 29.5%, the biggest area with vegetables, followed by Eastern region and the region of Skopje with slightly over 14%. While the first two regions known for growing vegetables for the convenience of natural conditions, the region of Skopje, no such benefits, however, to encourage a high vegetable consumer-center,Skopje.

Growing flowers and ornamental plants engaged in more growing area because it sometimes provides higher income than the agricultural crops, for which even state land was given in the concession (foreign companies) for the cultivation of perennial and ornamental plants in the relatively densely populated region (Polog) with excellent conditions for vegetable crops.

Therefore, this region has the highest participation in the areas under flowers and ornamental plants (30.1%), but in other regions, many small farmers have started to deal with this production because it is high labor and suitable in the conditions with a high percentage of unemployment, such as Macedonia.

**Regional participation of important areas cultures**

The limited space does not permit to show all crops participation by region, so we only limit on the most important for the national agriculture with emphasis on the characteristic of Macedonia. Wealth growing range of cultural plants in Macedonia has been reduced in recent years to nearly twenty crops. In sowing structure can not meet today, and some by which Macedonia was once known, such as cotton, sesame, poppy, anis, chickpeas, hemp, etc.. But today assortment of field and vegetable crops, which are followed by statistical information reaches thirty crops and fifteen types of fruit plants, and all that as a result of different and specific environmental conditions and traditions in the production.

**Wheat.** Because of the arid climate, its main grain yield (except rice) are not competitive in the market, which is why the import of grain and grain products in Macedonia a year spent twenty million dollars. But wheat has an important role because its production deal with most of the small farmers, as subsistence production for nourishment manufacturers themselves.

The largest area under wheat are located in the region of Pelagonija where natural conditions allow achieving over average yield, then the Eastern region with the largest territory of the Ovce Pole, with relatively dry conditions and the lowest yields (Tab.5).

**Industrial crops.** As stated previously, from the field of Macedonia disappeared more important types of crops including the largest number of industrial crops, from which the importance is only of tobacco and sunflower. Dominate the area under sunflower in Bitola part of the region of Pelagonija, while tobacco is dominant in the part of Prilep, the region of Pelagonija, but a significant percentage of tobacco surface participates in the South-eastern region.

**Forage crops.** In the statistics of Macedonia is registered the relatively narrow range of fodder for cattle feeding and insufficient for domestic needs which is why Macedonia is a permanent importer of animal feed.

While alfalfa is represented with a relatively equal participation in the five regions, falling corn is the dominant part in the region of Pelagonija.

*Tab.5 participation of major culture areas by region (census of agriculture, 2007), % (Total area per culture = 100)*

| Major crops | Pelagonia region | Vardar region | North-East region | South-western region | Skopje region | South-eastern region | Polog region | Eastern region |
|---|---|---|---|---|---|---|---|---|
| Wheat | 27,1 | 4,9 | 17 | 5 | 7,7 | 9,3 | 6,5 | 22,5 |
| Other grain (except wheat, barley and corn) | 30,6 | 1,8 | 24,7 | 3 | 6,4 | 3,9 | 2,6 | 27,1 |
| Sunflower | 68,3 | 0,3 | 11,5 | 0 | 3,5 | 6,1 | 0 | 5,5 |
| Tobacco | 58,8 | 5,1 | 0,2 | 0,1 | 2,9 | 28,6 | 0,2 | 4,1 |
| Alfalfa | 19,7 | 2,6 | 1,9 | 17 | 3,8 | 18,7 | 23,9 | 12,4 |
| Falling corn | 68,7 | 0,4 | 6,2 | 1,3 | 2,3 | 9,6 | 1,5 | 10 |
| Tomato | 11 | 5,3 | 9,5 | 4,2 | 16,4 | 35,2 | 11 | 10,1 |
| Pepper | 22,2 | 7,7 | 5,7 | 3,1 | 7,1 | 34,5 | 9,1 | 10,6 |
| Beans | 14,2 | 5,9 | 14,2 | 7,5 | 11,3 | 11 | 12,8 | 23,1 |
| Potato | 10,5 | 5 | 13,9 | 7,7 | 14,2 | 10,8 | 12 | 25,9 |
| Watermelon | 8,4 | 4,9 | 9,1 | 0,4 | 20 | 49 | 2,4 | 5,8 |
| Apple | 66,7 | 2,4 | 3,5 | 12,1 | 1,9 | 2,7 | 6,5 | 4,2 |
| Pear | 8 | 9,8 | 23 | 10,6 | 11,6 | 8,5 | 12,7 | 15,8 |
| Apricot | 3,3 | 23 | 18 | 2,2 | 15,2 | 23,4 | 3,3 | 11,6 |
| Peach | 2,2 | 72,7 | 2,8 | 1,1 | 8 | 10,6 | 0,7 | 1,9 |
| Vineyard | 3,8 | 48,2 | 6,3 | 1,6 | 5,3 | 24,9 | 0,4 | 9,5 |

**Vegetables.** Because of the importance of this production for the export of Macedonian agriculture, the importance is to look at any participation of vegetable crops by regions. In addition, we note that all the vegetables has been grown for natural consumption.

However, with tomatoes, peppers and watermelon, is dominated by participation in the areas in the South-eastern region, the largest share of beans occurs in the Eastern region, and then the region of Pelagonija and South-eastern region, which is close to the participation of beans in the region of Polog. Potato has the highest participation in the Eastern region, and than in the North-estern region.

**Fruit.** In Macedonia, the apple is represented with the largest areas in comparison to other types of fruit. The greatest percentage of area represented by region is shown in the region of Pelagonija, where the area of Resen is well known by apples, but once known area of Tetovo (region of Polog) by the surface, has been without a significant despite very favorable conditions. In apricot (whose area the last year significantly reduced), the highest share have the region of Vardar and South-eastern region, while the peaches dominates the region of Vardar, where belongs Rosoman, an area very well known for production of peaches.

**Vineyards.** The region of Vardar has nearly half the area under vineyards, occupying one-fourth of the area in the South-Eastern region, while in other regions the participation part of the vineyards is symbolic.

## Conclusion

Based on the text above, several conclusions and recommendations can be present:

- Under the influence of climate, terrain and other natural conditions, in the Republic of Macedonia differ a number of areas with specific requirements for growing agricultural crops. Global regional analysis of on a level of official region of Macedonia shows that the conditions are not rationally used, because the last years some important crops are no longer in range or represented in such an extent that they are not statistically relevant.
- Macedonia is statistically divided into eight regions, each with different indicators. By territory (area) the largest is the region of Pelagonija, with 4.7 thousand square kilometers, by number of inhabitants the largest is the region of Skopje and according to density, after the region of Skopje, follows the region of Polog.
- Participation of the regions in important capacities is different. The region of Pelagonija has the largest agricultural areas (25.5%), that means fields, orchards (28.1% as belonging to the Resen), the meadows and pastures, but with a relatively small share in the disposal of the vineyards (5.4%). It is obvious that the vineyards are the most frequent in the region of Vardar (44%).
- The number of livestock, as one of the basic capacity in agriculture, the differences are relatively high in cattle between the region of Pelagonija with the highest share of 21.2% and the region of Vardar with 4.8%. Among sheep, the highest contributor is the Eastern region (23.4%), as well as the participation of goats (28.4%) despite the low participation in available pastures.
- The most usage of arable land and garden area (25.2%) belons to the region of Pelagonia, then to the Eastern region, where belong the Ovče Pole and Kocansko Pole, while the lowest participation have South-western region (5.3%) and the region of Vardar (6.2%).
- Analysis of the participation of regions in the areas by groups of culture show that dominate the area under wheat in the region of Pelagonia (24.2%) and the Eastern region (23.2%). Industrial cultures with the greatest also in the region

of Pelagonia (57.7%), but with high participation and the South-estern region dominated by tobacco (22.9%). The largest contributor in area of fodder crops is the region of Pelagonija (20.2%) due to the relatively high prevalence of livestock-mostly cattle. The largest area with vegetables has the South-eastern region, 29.5%.

- Global analysis of official regional-level in Macedonia indicates that conditions are not rationally used, because in recent years some important crops are no longer represented in the assortment or they are represented in such a volume that is not statistically relevant.
- Research and analysis in the field of regional convergence should direct range over a wider area in order to comprehend the specific conditions of the narrow areas to expand the production that enable better results thanks to new varieties, which could acclimatize to unfavorable conditions.

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Economics of agriculture
SI – 2
UDK: 631.164:633.63+664.12

# ECONOMIC EFFECTS IN THE PRODUCTION OF SUGAR BEET AND SUGAR

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## Abstract

*The objective of the study is the labor productivity in the production of sugar beet and sugar in three agricultural enterprises on 4.624 ha. The areas under sugar beet comprised in this study participate with 64.7% in the overall areas under this crop in the region of Srem. The annual production of sugar beet provides for the needs of sugar refineries in total. The basic factors affecting the productivity are: the level of technical equipment, natural factors, the selection of sugar varieties, applied modern technology, the organization of work, the qualification and motivation of the employees. The results can be used for the promotion of business, agro-economic analyses, planning, agro-marketing needs and for the comparison of one`s own productivity with the presented results .*

**Key words:** *productivity, economic production, profitability, labor input and machinery input per hectare, production per hour*

## Achieved results and labour productiviti in the production of sugar beet and sugar

Taking into account the fact that the labor productivity is a criterion for the success in business, the objective of our paper is to give an answer to the following questions: how to produce more and how to meet higher standards and produce more economically. The enterprises N, M, and A comprised in this research produced sugar beet on the area of 4.438 ha in 2008 and on 4.624 ha in 2009. The areas under sugar beet comprised in this study participate with 64.7% in the overall areas under this crop in Srem. On the other hand the selected enterprises are the most significant sugar beet

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producers in the region. In the sowing structure, on average for all the enterprises, sugar beet participates with 14.24% i.e. in N with 8.14%, in A with 13.93% and in M with 18.67%. (Tab.1)

## Production and economic effects in the sugar beet production

One of the essential factors on which the level of productivity depends is the obtained yield per area unit. By the analysis of the obtained yields we have established that in N, on the area of 666 ha, the yield was 61 tons per ha with the tendency of 17.8% increase compared to 2008. In M on the area of 2,252 ha, the yield was 62 tons per ha i.e. 12.1% more compared to the same period while in A, on the area of 1,706 ha, the yield was 55.8 tons per ha. On average for all the enterprises on the area of 4,624 ha the yield was 59.6 tons/ha which is 10 % more in comparison with the production per area unit in 2008.(Tab.4). The obtained yields in the production of sugar beet are the result of the achieved agro-technical measures, favorable plant spacing, favorable assortment, climatic and soil factors. The emphasis in on the fact that besides the obtained yield per area unit of approximately 60.0 tons/ha on the area of 4,624 ha at the mentioned enterprises, the content of sugar in beets was high. Thus, on average at M the sugar content in beets was 16.58% and at A it was 16.78%. On average, in the region of Srem, on the area of 7,174 ha, the mean digestion was 16.6 %. Comparing the obtained yields in tons/ha in enterprises on average with the producers in the AP of Vojvodina, it can be concluded that the yield in the enterprises was 10.1 tons/ha higher in 2008 while in 2009 it was 12.5 tons per ha. The achieved yields in the production of sugar beet in enterprises are far higher than the average yields on holdings in Vojvodina. (Tab.2). In the structure of the average costs of the studied enterprises in the production of sugar beet (169,827 dinars) the seed participates with 10%, mineral fertilizers with 16.6%, pesticides with 16%, labor input with 12%, machinery costs with 25% and other costs with 20.4%. It is evident that the workforce and machinery costs participate in this intensive production with 37%. The comparative analysis shows certain differences in the cost structure which, in most cases, depends on the sowing density, natural conditions, input costs, number of operations from the technological schedule, wages, machinery equipment, interest rate and running or indirect costs. The economical side in the production of sugar beet of 1.35 shows that all the available recourses were used rationally. A economized better than the average. On average there was 1.35 dinars of returns on each dinar invested.(Tab.3)

The profitability of the production of sugar beet presented through the ratio of average profit and yield is:

**Rp (2008) 34,569/162,600x100 = 21.260%**
**Rp(2009) 59,439/229,266x100 = 25.926%**

The profitability rate shows that there was a high profitability rate with the tendency of increase in relation to the previous period on each 100 dinars invested.

A high profitability rate is present in all the enterprises, the highest being in A. The comparative analysis of indices of economy and productivity (Kanisek, 2008) shows the objectivity and reality in presenting the indicators of the economy quality in the sugar beet production.

## Labor and machinery input in the sugar beet production

The essential factor on which the labor productivity depends in the sugar beet production is direct labor input. The results show that the labor input per area unit varies considerably in the three studied enterprises. On average, for all the three enterprises the labor input in the sugar beet production was 51.1 hour/ha with the tendency of decrease of 6.1% in relation to the labor input from the previous year.

**Pr (2008) Q(t/ha)/T(hour/ha) 54.2/73.4 = 0.734 t/hour**
**Pr (2009) 59.6/68.9 = 0,865t/hour**

In the same period in the sugar beet production the machinery input was 17.2 hour/ha with the trend of decrease of 6.3%. The level of mechanized farming in the sugar beet production is illustrated by the data that the machinery participates with 25.3% and workforce with 74.7%. In the sugar beet production the total input (labor and machinery) was 68.9 hours/ha in 2009 and in 2008 it was 73.4 hours/ha. The total input was reduced by 7.1% in 2009 in comparison to the previous period. The analysis of the input shows that M had the lowest labor input of 47 hours/ha per area unit and that N and A approximately had 53 hours/ha (Tab.4).

## Labor productivity per production unit (hour/ton)

In the sugar beet production all the enterprises had the labor input of 0.861 hours per ton in 2009 and in 2008 it was 1.018 hours/ton. It is evident that the labor productivity in the sugar beet production, on average, in the studied enterprises presented through the labor input per production unit is permanently increasing. The increase of labor productivity resulted from the permanent yield increase and the decrease of labor input per area unit. In the enterprises the yields per ha are increased by 10% and the labor input per ha is decreased by 6.1% in comparison to the previous year. In 2008 in the mentioned enterprises the labor input was 1.018 hours/ton and in 2009 it was 0.861 hours per ton. The result is that the sugar beet producers achieved higher productivity of 16.3% in 2009. To be more precise, the production per hour was 996.3kg of sugar beet in 2008 while in 2009 it was 1168 kg or 17.1% more. The labor productivity presented on the basis of the total labor input (current and past) in the enterprises was increased by 6.1%. Thus, in 2008 the total input was 1.35 hours/ton and in 2009 it was 1.15 hours/ton. The achieved labor productivity in sugar beet production and its effects on the operating results is illustrated by the data that in 2009 on average the production

value per labor per hour was 4253.3 dinars or 43.8% more compared to the previous year i.e. 3146.4 dinars of production value of total labor per hour (current and past) or 40% more compared to the previous period. (Tab.4).

The development conception of the enterprises is based on the need for direct vertical economic ties of producers and manufacturers of sugar beet and sugar. Considering this conception it is interesting to present the achieved productivity for the whole production process based on labor and total input. In the production process sugar beet-sugar in 2008 in the sugar refinery SM the labor input per ton of sugar beet and sugar was 31.4 hours i.e. 1.018 hours/ton of sugar beet and 30.40 hours/ton of sugar. In 2009 in the process of production and manufacturing 26.0 hours/ton were spent, i.e. in the sugar beet production 0.861 and in sugar production 25.18 hours/ton. It shows that in the process production-manufacturing the labor productivity was increased by 17.2% in relation to the previous year.(Tab.5).

## Conclusion

Based on the data on the achieved results and labor productivity in the production of sugar beet and sugar in the enterprises in the region of Srem the following facts can be emphasized. In the three studied enterprises in Srem on the area of 4,624 ha the average yield of 59.6 tons/ha was obtained and was increased by 10.0%. The natural conditions, the introduction of rich sugar varieties, modern equipment with the application of the appropriate agro-technical measures result in high yields in this production. On average, 51.1 hours/ha of labor input was needed in all the studied enterprises with the trend of decrease by 6.1% in relation to the labor input from the previous year. In the production of sugar beet there was 17.8 hours/ha of machinery input. In the production of sugar beet the total input was 73.4 hours/ha in 2008, and it was 68.9 hours/ha in 2009, which means that the total input was reduced by 6.1% in comparison to the previous period. In the structure of total input the labor input participates with 74.2% and machinery input with 25.8%. In the production of sugar beet the labor input was 1.018 hours/ton in 2008. and 0.861 hours/ton in 2009. It means that the labor productivity in sugar beet production in the enterprises was increased by 15.5% a year. The increase in labor productivity resulted from yield increase of 10% and decrease in labor input per area unit. The economy in the sugar beet production shows that the recourses were used rationally and that there was 1.35 dinars of returns on each dinar invested. On average, a high profitability rate of 25.9% was achieved in the studied enterprises. The productivity measured through production per hour of total work shows that in 2009 the production was 0.869 tons/hour or 17.8% more compared with the previous year. The labor productivity measured on the basis of the total current and past labor input was increased by 15.6% since in 2008 the input was 1.374 hours/ton and in 2009 it was 1.160 hours/ton. The productivity expressed in value shows an increase of 43.8% per hour of labor input i.e. 40.0% per hour of total input. The production of one ton of sugar required 25.18 hours of labor input with a trend of decrease of 17.2% compared with the previous year. The production of sugar

was 6,587 kg/ha. In the process of sugar beet and sugar production the labor input was 26.0 hours/ton. The labor input of current and past labor in this process in the sugar refinery in SM was 26.34 hours/ton for both products. The presented results point out that there is an increase of labor productivity in the production of sugar beet and sugar. The increase in productivity can be achieved by further increase in the yield of both beet and sugar per hectare, by decrease of labor input per production unit, by better organization of work, by introduction of incentive payment system, by improvement of labor and technological discipline in the production and by enhancement of the quality of work as well as of the products.

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## Appendix

*Table 1. Participation of sugar beet in sowing structure in %*

| Enterprise | 2008 | 2009 |
|---|---|---|
| N | 6,64 | 8,14 |
| A | 14,0 | 13,93 |
| M | 18,58 | 18,67 |
| Average | 13,99 | 14,24 |

*Source: Data from enterprises*

*Table 2. Comparative review of obtained yields (tons/ha)*

| Production | 2008 | 2009 | Index |
|---|---|---|---|
| AP Vojvodina | 44,1 | 47,1 | 106,8 |
| Enterprises in Srem | 54,2 | 59,6 | 109,9 |
| Difference | 10,1 | 12,5 | 123,8 |

*Source: The Executive Council of AP Vojvodina and original data organization*

*Table 3. Economic effects in the production of sugar beet (din/ha, Ke and %)*

| Enterprises | Period | Revenue | Costs | Profit | Econom. (Ke) | Profitability % |
|---|---|---|---|---|---|---|
| N | 2008 | 155.400 | 117.727 | 37.673 | 1,320 | 24,2 |
| | 2009 | 219.140 | 162.326 | 56.814 | 1,350 | 25,9 |
| | Index | 141,0 | 137,9 | 150,8 | 102,3 | 107,0 |
| A | 2008 | 160.500 | 124.419 | 36.081 | 1,290 | 22,5 |
| | 2009 | 195.000 | 139.286 | 55.714 | 1,400 | 28,6 |
| | Index | 121,49 | 111,9 | 154,4 | 108,5 | 127,1 |
| M | 2008 | 165.900 | 138.250 | 27.650 | 1,200 | 16,7 |
| | 2009 | 233.856 | 181.284 | 52.572 | 1,290 | 22,5 |
| | Index | 140,9 | 131,1 | 190.1 | 107,5 | 134,7 |
| Average | 2008 | 162.600 | 128.031 | 34.569 | 1,270 | 21,3 |
| | 2009 | 229.266 | 169.827 | 59.439 | 1,350 | 25,9 |
| | Index | 141,0 | 132,6 | 171,9 | 106,3 | 121,6 |

*Source: Estimate based on standard calculations in sugar beet production*

*Table 4. Labor productivity in sugar beet production*

| Enterprises | Period | Areas, yields and labor productivity in sugar beet production | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Area | Yield tons per ha | Value per ha in dinars | Production Input | | | | Productivity per hour of direct input in dinars | |
| | | | | | Per ha hour | | Per tons hour | | Labor | Total |
| | | | | | Workers | Machines | Workers | Tractors | | |
| 1 | 2 | 3 | | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| N | 2008 | 495 | 51,8 | 155.400 | 55,0 | 18,6 | 1,061 | 0,359 | 2.818,2 | 2.105,9 |
| | 2009 | 666 | 61,0 | 219.140 | 53,0 | 17,0 | 0,869 | 0,278 | 4.134,7 | 3.130,6 |
| | Index | 134,5 | 117,8 | 141,0 | 96,3 | 91,3 | 81,9 | 77,4 | 146,7 | 148,6 |
| A | 2008 | 1.735 | 53,5 | 160.500 | 57,3 | 19,1 | 1,071 | 0,357 | 2.801,1 | 2.100,8 |
| | 2009 | 1.706 | 55,8 | 195.000 | 53,4 | 18,2 | 0,957 | 0,326 | 3.651,7 | 2.723,5 |
| | Index | 98,3 | 104,3 | 121,49 | 93,2 | 95,3 | 89,3 | 91,3 | 130,3 | 129,6 |
| M | 2008 | 2.208 | 55,3 | 165.900 | 51,0 | 19,5 | 0,922 | 0,352 | 3.252,9 | 2.533,2 |
| | 2009 | 2.252 | 62,0 | 233.753 | 47,0 | 18,2 | 0,758 | 0,293 | 4.973,5 | 3.585,2 |
| | Index | 102,0 | 112,1 | 140,9 | 92,1 | 93,3 | 82,2 | 83,2 | 152,8 | 141,5 |
| Leverage | 2008 | 4.438 | 54,2 | 162.600 | 54,4 | 19,0 | 1,018 | 0,356 | 2.957,4 | 2.246,6 |
| | 2009 | 4.624 | 59,6 | 229.266 | 51,1 | 17,8 | 0,861 | 0,299 | 4.253,3 | 3.146,4 |
| | Index | 104,2 | 110,0 | 141,0 | 93,9 | 93,7 | 83,7 | 83,9 | 143,8 | 140,0 |

*Source: Authors` calculations*

*Table 5. Labor productivity in sugar production in certain sugar refineries (hours/ton of sugar)*

| Period | SM | C | V | Z |
|---|---|---|---|---|
| 2008 | 30,40 | 25,76 | 32,84 | 25,45 |
| 2009 | 25,18 | 22,90 | 32,84 | 25,45 |
| Index | 82,80 | 88,90 | 100,00 | 100,00 |

*Source: Data from sugar refineries and the authors` calculations*

Economics of agriculture
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UDK: 663.2 (498)

# CHALLENGES OF WINE CHAIN IN ROMANIA

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**Abstract**

*The purpose of this paper is to identify new challenges of wine chain in Romania, referring mostly to wine safety and traceability. The reason why the research was underpinned is that many unauthorised products or products obtained using forbidden substances exist on the wine market. In this paper, food safety and traceability principles and requirements are applied to wine chain. Food safety and protecting consumers' interests represent concerns for people, professionals and organizations. Wine is a product for which consumers manifest lack of trust in those regarding the content and methods of production.*

*The research method consists in documentation and legislation analysis. The main results show that problems on the wine chain, including consumers' lack of trust, might be overcome by implementing and respecting the principles of traceability.*

**Key words**: *traceability, wine, food safety*

## Introduction

The establishment and implementation of a traceability system in the domain of agribusiness are useful to the effect that the internal market of agro-food products could function well, to grow the quality of the products and, thereby, to grow competition of the products on the domestic and external markets.

The run of agro-food products' markets may be put at stake if the traceability is not assured on the product's chain. It can be taken into account the example of wine, on the market whose exists unauthorised products – fake products – or products that contain forbidden substances in the wine obtaining technology. Consumers accept to buy these products because of their low price, even though they are dangerous for the health of people.

Unauthorised products or products obtained using forbidden substances exist

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on the wine market. According to a handout sent by the National Authority for the Consumer Protection, 42% of the wines on the market are fake. This is the conclusion of a check regarding the quality and the way of wine marketing, done by NACP in over 80% of the counties of the country. Wines that were found fake had in their composition dyes, synthesis sweeteners, added sugar, and aromas; also, they did not fit the declared wine type. After another check made at many wine distributors in Bucharest, it has been ascertained deviations at 25 from the 42 economical agents who were controlled (Infonews, 2006).

## Material and method

The research method consists of documentation and legislation analysis. It has been studied the Regulation (CE) no. 178/2002 of the European Parliament and the Council, from 28 January 2002, establishing the principles and general requirement of alimentary legislation, institution of the European Authority for the Food Safety and procedures in the domain of the food products safety.

As regards to the study material, there will be presented the defining of traceability, the principles and requirements of food safety and traceability encompassed in the reminded regulation.

According to the definition contained in the article 3, aligned 15, from the Regulation CE 178/2002, traceability means the ability to trace and follow a food, feed, food producing animal or substance intended to be, or expected to be incorporated into a food or feed, through all stages of production, processing and distribution.

Generally speaking, the food legislation has as purpose to assure a high protection level of life, human health and the protection of consumers' interests, including right practices in the food trade. The principles of food safety and traceability are: the principle of precaution, the principle of consumers' protection, the principle of transparency (consulting and informing the large public).

*The principle of precaution* refers to the fact that, in typical conditions where, after the evaluation of the disposable information, it is identified the possibility of the existence of some harmful effects to the health, but it persists the scientifically uncertainty, there can be adopted temporary measures to manage the risk, needed to assure the high level of human health protection established in the Community, until emerging new scientific information needed for a more comprehensive evaluation of the risk.

The adopted measures must not impose commercial restrictions bigger than necessary to achieve the high level of protection of health established in the Community, taking into account the technical and economical feasibility, and also other agents considered lawful for the certain problem.

*The principle of consumers' protection* refers to the fact that the food legislation has as a purpose to prevent fraudulent or deceiver practices, the counterfeit of food products and all kind of practices that may mislead the consumer.

*The principle of transparency* has as purpose to ask and inform the public. People are consulted openly, straight or through the representative body, along the preparation, the evaluation and the revision of food legislation. If there are any reasonable reasons to suspect that some food products or feed may represent a risk for the human and animal health, then, considering the gravity and dimensions of the certain risk, the public authorities take adequate measures to inform the people regarding the type of the risk for health, identifying, mostly, the type of food products or animal feed, the risk that these may present and the measures that are taken, or are about to be taken to forewarn, reduce, or eliminate that risk.

*The requirements of the food safety and traceability* are:

The prohibition of putting on markets food products that do not present safety.

1. The food products that do not present safety are those that: are injurious for health and that are not proper to the human consume.
2. To determine whether an alimentary product presents or not safety, it must be taken into account:
   - the normal conditions of using the food product by a consumer in each phase: production, processing and distribution;
   - the information delivered to consumers, including the information on the label, or any other information disposable for consumers regarding the avoidance of certain negative effects on the health of a certain alimentary product or certain category of alimentary products.
3. To determinate whether an alimentary product injures or not the health, it must be considered:
   - the immediate conceivable effects and also the ones on short or long term of that food product on the health of a person who consumes it, but also on the next generations;
   - the probable cumulative toxic effects;
   - the distinguished sensitivity, referring to health, of a specified category of consumers, when the food product is intended for that category of consumers.
4. To determinate whether an alimentary product is proper or not to human consumption, it must be taken into account if the alimentary product is inadmissible for the human consume according to the utilization to whose it was delivered, from reasons regarding the contamination, no matter if that one is made though a outside substance or in other way or through putrefaction, deterioration or decomposition.

The 18 Article from the Regulation CE 178/2002 makes referrals to the traceability of food products and any other substance delivered or intended to be incorporated in an alimentary product for all production, processing and distribution phases. The Article forecasts that the operators from the alimentary branch could identify any person from who had been supplied with an alimentary product or any other substance intended to be incorporated in an alimentary product. To this effect, the operators of the chain must dispose of informational systems that allow that this information could be put out to the able authorities. Also, the informational systems must offer information regarding the identification of other societies to whom it has

been delivered their products.

In the same regulation it is provided that the alimentary products introduced on the market must be tagged or identified in a suitable way to facilitate their traceability, through documentation or appropriate information.

The operators of the chain are beholden to initiate withdrawal procedures of products on the market or inform about the situations in which they consider that an alimentary product that had been imported, made or distributed does not content the requirements regarding the food products safety. If the product might have reached the consumer, the operator informs the consumers about the products that had already been delivered to them, when other measures are not enough to realise a high level of protection of health.

## Results and discussions

The main digressions tripped up after the analysis within the Laboratory for the Analysis of the Quality of Wines and Alcoholic Drinks, Bucharest, are divided in digressions regarding the sensorial characteristics and digressions regarding the physical-chemical characteristics. Table wine "Buchet", red and white table wines packaged in bulk were analysed.

Regarding the digressions of sensorial characteristics, the analysed wines presented:

- the mild smell given by the wine
- extracting, irritant, unspecific and mild taste
- unspecific colour for the red wine
- opalescent aspect
- yeast smell
- distasteful, unbalanced, of excessive acidity taste
- yeast taste
- turbid aspect, specific smell and taste, starting to turn into vinegar
- turbid aspect, pointed yeast smell and taste and excessive acidity.

Regarding the digressions of physical-chemical parameters, it has been found that the analysed wines were unfit for the human consumption and contradicted the legislation.

Most of the quality problems are found to the wines packed in PET bottles, the products being faked. Still, they have an assured market, because they have an extremely low price compared to the wines of origin. The fakes consisted in the utilization of the picket, or the „second-hand wine", product that, according to the law, it is not allowed until the fabrication of the vinegar and until the distillation. Also, artificial alimentary pigments, added sweeteners are used. In many cases, in PET bottles wines are packed without being conditioned; they ferment and change their colour in time and depose.

The producers who falsify the wine contradict the Vine and Wine Law in those regarding the labelling of the product, the geographic indications from the legislation.

They mention trade marks as assortments and create confusions among consumers.

Starting with the observed deviations, the principles and requirements of the food safety can be implemented. Thus, *the principle of precaution* refers to the identification of the possibilities that wine products put on the market have harmful effects on the health. With an informational system of monitoring traceability on the wine chain, the moment, quantity and place where a product was obtained and delivered can be identified. Thus, traceability leads to improving food safety.

To respect the *principle of the consumers' protection,* the operators of the wine chain must respect the legislation to prevent the fraudulent or deceiver practices, the wine counterfeit and any other practices that may confuse the consumer.

*The principle of transparency* bears in mind the consultation and information of the people about the wine products: vineyard, assortment, fabrication years, the fabrication method, etc.

The requirements of the alimentary safety and traceability on the wine chain refers to the prohibition of putting on the market the wine that do not present safety, that injures health or that is not proper to the human consume.

In this respect, the wines that do not represent safety, that injures health or that are not proper to the human consumption are the ones that do not have smell, taste, and aspect typical to the wine; also they have a distasteful, outbalanced, of excessive acidity or a taste of yeast, they have an turbid aspect, specific smell and taste starting to turn into vinegar; they contain artificial alimentary pigments, sweeteners added, unfit wrappers, because wines fermented and change their colour etc.

## Conclusions

The implementation of the informational system for monitoring traceability on the wine chain is necessary so that the domestic market could function well, the quality of the products could grow and, so, also, the competition of the products on domestic and external markets will grow.

According to the legislation, the operators on the wine chain should be able to identify any person from who it has been supplied with raw material and products and, in the same time, they must be able to identify the economical agents to whom they have been sold the products resulted from the technological process. To that effect, the operator of the chain must dispose of informational systems that allow that this information could be made available to the competent authorities.

All the operators of the chain have something to gain after the implementation of the traceability of the food products. Through the medium of traceability system, the consumers are better informed regarding the composition of the products and the way they are made, becoming trustful in the buying process for which the traceability is certified. Therewith, the apparition of some problems in the alimentary safety domain is avoided.

The agricultural producers and the processors of agricultural products are the most well situated operators of the alimentary chain to make a safe supplying system

of agro-food products, safe for health. They must have the main legal responsibility for the safety of food products.

By introducing the informational system for monitoring traceability on the product chain, the producers that obtain products according with the requirements of the traceability will difference the offers towards the ones that refers to disloyal practices and that will develop their own market for the products in which the consumers trust. This informational system becomes a marketing instrument that can be successfully used by the wine producers to attract the costumers and gain their faith.

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Economics of agriculture
SI – 2
UDK: 630*27 (497.113)

# ECONOMICAL AND ECOLOGICAL IMPACT OF SHELTERBELTS

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## Abstract

*For the last several decades, ecologists have been warning the public about the issues of overuse and damage of natural resources, resulting in loss of biodiversity, and the need for environmental conservation. Vojvodina is a flat and deforested territory, characterised by strong winds causing wind erosion. Since planting forests on soils belonging to the first three categories was forbidden by the law, planting shelterbelts can provide a solution. They can provide relatively cheap and long-term solution. When properly planned, shelterbelts provide numerous economic, social and environmental benefits. They reduce wind impact, control snow spreading trapping it, protect livestock, buildings and gardens. Shelterbelts also provide habitat for wildlife and decorate the environment.*

***Key words***: *shelterbelts, Vojvodina, agriculture*

## Introduction

The number of people is increasing in the World, followed by an increased lack of food. According to FAO's data world's population is over 6.6 billion. On the other hand, urbanization and industrialization constantly causes reducing of agricultural soil.

Favorable natural conditions such as fertile soil and favorable continental climate, make agriculture most significant branch of economy in Vojvodina. Agricultural fields cover 84% of its total territory. Vojvodina is a flat area, with an elevation of about 60-100 meters above the see level. It is vastly deforested (*figure 1*) and characterised

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by strong winds causing wind erosion (*Letić i sar., 2009*). Afforested areas in Vojvodina are small and irregularly distributed (*Pekeč et al., 2008*). According to *Vlahović, 1986*, optimum percentage of forest covered areas in Vojvodina should be 14.3%.
Since planting forests on soils belonging to the first three categories is forbidden by the current law, planting shelterbelts can provide a solution.

Shelterbelts can be a link between productive agriculture and protection of biodiversity. It is of particular importance to introduce sustainable development and protect biodiversity in areas of field-crops (*Bošković, et al, 2003, 2005 a, b; 2006; Simić, et al., 2007*).

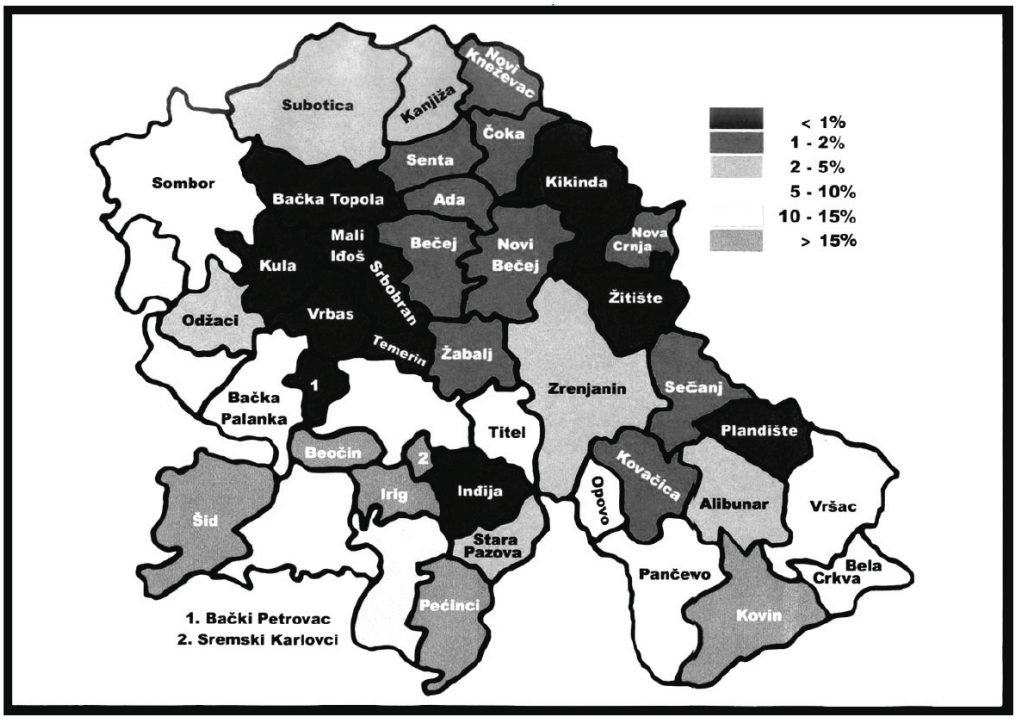



*Figure 1: Afforested of Vojvodina municipalities (Rončević et al, 2005)*

## Impacts of Wind Erosion

Wind erosion is a result of material movement by the wind. It generally occurs in areas with little or no vegetation, as it is the case in whole of Vojvodina (during spring and autumn, when winds are strongest, fields are covered with little or no vegetation). Most of the soils in Vojvodina are high quality soils therefore wind erosion presents a serious problem. Wind erosion is known to be able to losses of 2 t/ha of soil per year. According to *Velašević et al. 1989*, wind eroded sediment contains eight times more humus, 10 times more nitrogen, 5 times more phosphorus and potassium in comparison

with the main land, from which it was carried away. That means that each year, soil loses large amounts of humus and minerals hence reducing its fertility due to wind erosion, polluting the air and water and at the same time. Wind erosion may also have the potential to transport pesticides.

## Influence of wind erosion on air pollution

According to some published data (*Tomanović, et al, 2003*) air pollution in Sombor municipality can be influenced (in April and May) by field works. Local farmers have started planting modern varieties in order to increase yields causing fertilizer consumption and pesticide levels to grown rapidly. Nitrogen consumption, for example, increased from 2 to 75 million tons in the last 45 years, and pesticide consumption has increased by 10-30% during the 1980s in many countries (*Pretty, 1995*).

Most of these include some toxic substances that can negatively affect human health and the environment.

Children are more sensitive to toxic effects of applied substances than the adults, since their organisms, nervous and immune system are still developing, cell division is much faster and their weight is lower (*Zahm and Ward, 1998*).

The long-term health problems can occur after a single exposure to high concentrations or after the exposure to low concentrations of pesticides over the long period of time. The long-term health problems include asthma, leukemia, Parkinson's disease, birth defects and various types of cancer (*Dich, et al.,1997*)

Statistics from the Dispensary for lung diseases and tuberculosis in Sombor show that numbers of lung cancer have been tripled in Sombor municipality during the period between 2002 and 2005. According to data obtained from Sombor's Institute for public protection, 75.39% of preschool children, and 46.49% of school children and other youth suffer from respiratory system diseases in Sombor municipality.

## Influence of shelterbelts

Shelterbelts have been used for centuries to alter environmental conditions in agricultural areas and recently started to be used in rural/urban interfaces, providing numerous economic, social, and environmental benefits (*Droze, 1977; Cook and Cable, 1995; Schoeneberger et al., 2001*).

Field shelterbelts consist of rows of trees (in Sombor region 4 rows of different kinds of trees) planted on rural/urban land. Shelterbelts consisting of 4-6 rows of trees show best wind-control results (*Xue-bin, 2002*). They protect crops and soil (regardless of cropping system used), keep snow (thick shelterbelts trap snow close to the shelterbelt, reducing snow removal costs from adjacent roadways and improving road safety, *Shaw, 1988*) and distribute snow (porous shelterbelts alter windflow so that

snow is distributed relatively uniformly across a field, *Scholten, 1988*), and improve the micro-climate for the crops growing in their shelter, increasing the soil moisture.

Soil humidity is 9-10% higher in protected areas compared with the unprotected (*Hanjie and Hao, 2003*). Shelterbelts can provide relatively cheap and long-term solution for reducing effects of wind erosion. They can reduce wind speed by 10-15% in front of shelterbelts, and 20-60% at the back (40-60 high of shelterbelts. Crops benefit from the reduced wind speed in the protected zone. The plants are less likely to be twisted by the wind or sandblasted by eroding particles (*Mize,et al.,2008*). Wind speed reduction is used in rural/urban areas to protect buildings, livestock, roads, as well as visual and oddour barriers (*Brandle, et al., 2004*). A shelterbelt must be designed to perform its main function with optimum effectiveness. They are especially important in dry years when low crop yields result in insufficient residue cover. They help increase biodiversity and stop evaporation as well.

According to available data, evaporation is 30-40% lower in areas with forests or shelterbelts. Protected area from evaporation is 50-60 high of shelterbelts. During the summer, air temperature is for $4^0$ C lower in shelterbelts area compared with open areas. Soil temperature at the depth of about 15-30 cm is for about 4-5$^0$C lower in shelterbelt areas, compared with open areas, providing better air circulation in the soil, during the summer period. During winter period situation is reverse.

Shelterbelts help increase biodiversity providing habitats for many species. More pollinating insects are found in shelterbelts areas than in open areas. For example, honey bee flight is inhibited at wind speeds of 6.7-8.9 m/s (*Norton, 1988*). A number of insects, such as aphids (*Homoptera: Aphididae*), are carried by wind (*Pasek, 1988*). Shelterbelts reduce wind speed hence reducing the damage associated with aphid transmitted viruses (*Simons, 1957*). Bird species that feed on crop pests, reduce insecticide reqirements and costs (*Dix et al., 1995*). A Kansas study indicated significant economic benefits (US$30 million annually) could be attributed to hunters using shelterbelts for bird hunting (*Cable and Cook, 1990*).

Shelterbelts project in Sombor region has started in late eighties and untill now more than 60% of projected work has been finished. Shelterbelts cover nearly 700 ha (or 700 km of trees). The project has not been finished yet, because of political situation (lack of local government support), and unsolved property law legislation problems concerning shelterbelts. Shelterbelts have been put in danger when the proprietors of land covered by stelterbelts (various agricultural organizations), entered the process of privatisation. As shelterbelts have not been protected by law, new owners can cut it with no consequences (*figure 2*).

Unfortunately, shelterbelts are not properly protected by law. Their cutting does not require consequential forest-planting, and if done in area less than 1m$^3$ is treated as penalty, not as a crime.



*Figure 2: Cutting shelterbelts (Prijić, 2008)*

## Conclusion

Shelterbelts are linear forests established on the landscape to achieve various (conservation, economic, social and environmental) goals. These designed corridors protect crops and livestock from wind, store carbon and offer habitat to numerous insects, birds, and small mammals. As we understand their function better, we will be able to utilize them more efficiently and create more stable landscapes. Facts, such as those showing that the air in the parks contains 200 times less bacteria then the air above streets and that 1 ha of forests absorb 8 liters of $CO_2$ per hour (*www.pokretgorana.org.rs*) should encourage shelterbelts plantining project in Vojvodina to be finished.

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Economics of agriculture
SI – 2
UDK: 664.314 (497.11)

# ECONOMIC CHARACTERISTICS AND SIGNIFICANCE OF THE OIL PLANT SECTOR IN SERBIA

*Dragica G. Božić*[1], *Petar M. Munćan*[2]

## Summary

*Serbia is one of the largest producers of oil crops in Europe, primarily of sunflower and soy bean. In the structure of harvested surfaces under oil crops in Serbia (amounting in the last decade to over 300 000 ha) sunflower takes the first place (almost two thirds of total surface in certain years), followed by soy bean. The lowest share in harvested surfaces under oil crops has the rapeseed, whereas the production of oil pumpkin is only just starting. Increased demand for oil plants on international market in recent years caused significant increase of prices which reflected on the production of these plant cultures.*

*Objective of this paper is the analysis of the most important economical characteristics and contribution of the oil crops sector to the economical development of Serbia in the period 2000-2008. Principal indicators of the significance of a sector in the total economical development of Serbia were analyzed, share in the Gross Added Value, employment and export. Economical efficiency of the production of main oil crop cultures (sunflower and soybean) on family agricultural households in Serbia has been established.*

*Main sources of data were publications and internal documents of the Statistical Office of the Republic of Serbia. Calculations of Gross margin which were used to consider economical efficiency of the oil crops production were composed based on elements gathered in performed survey. Survey was performed on 50 selected family agricultural households which are exclusively engaged in crop production.*

**Key words**: *sunflower, soybean, plant oils, gross margin, macro economical indicators.*

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## Introduction

Objective of this paper is analysis of the present situation and of economical characteristics of the oil crop production sector, as well as of the contribution of this sector to the economical development of Serbia in the last decade, which was period of significant socio-economical changes. Determination of basic macroeconomic indicators was used to assess the position and significance of the oil crop production sector in the economical structure of the country. The sector has realized significant progress in past few years. This reflects primarily in increase of the land surfaces under oil crops, prices have become relatively stable, consumption of oil on the domestic market has increased, a significant level of profitability of both manufacturers and food processing has been achieved. Positive tendencies in the sector are result of increase of oil crop prices on international market induced by increase of demand, finalized process of privatization of oil plants and increased investments in their modernization and introduction of quality systems, but also certain agricultural policy measures aimed at stimulating production. However, violation of the external price parities of primary agricultural products, including oil plants, and industrial inputs used in this production (mineral fertilizers, fuel, declared seed, etc.) manifested in the last year of analysis, threatens to worsen the economic position of producers also in this sector, and diminish its importance for total economical development of the country.

## Method and Data Sources

Main sources of data were publications of the Statistical Office of the Republic of Serbia and various documentation materials of this institution. Also, data of the Ministry of Agriculture, Forestry and Water Management of Republic of Serbia were used. Common mathematical-statistical methods were applied to establish basic economic characteristics of the oil crop production sector. Basic macroeconomic indicators (share of oil crop production in Gross Agricultural Output GAO, share of the industry of refined plant oils in Gross Value Added – GVA of the industry of food products and beverages, and share of the sector in foreign trade) were applied in the consideration of the relevance of this sector in economic structure of the country. Calculations of Gross margin which were used to consider economical efficiency of the oil crops production were composed based on elements gathered in performed survey. Survey was conducted on 50 selected family agricultural households which are exclusively engaged in crop production, and within it, production of oil crops.

## Results and Discussion

### *1. Main characteristics of oil crop production in Serbia*

Total surfaces under oil crops in Serbia, in the analyzed period, were approx. 300 000 ha (table 1). The highest share within the structure of harvested oil crops

have surfaces under sunflower, approx. 200 000 ha in year 2003. Rapeseed had the lowest share in harvested surfaces, however in recent years a significant increase in this production has been recorded (average annual rate of 14,08 %).

Production of sunflower and soybean has more than doubled, and production of rapeseed has increased almost five times in the observed period. Measures of the agricultural policy have considerably contributed to these tendencies (production premiums, direct payments per hectare, reimbursement of inputs, incentives for procurement of mechanization, etc.).

*Table 1. Harvested surfaces and oil crop production in Serbia*

| Year | Sunflower | | Soy bean | | Rapeseed | |
|---|---|---|---|---|---|---|
| | Surface (ha) | Production ( t) | Surface (ha) | Production ( t) | Surface (ha) | Production ( t) |
| 2000 | 146 415 | 217 608 | 141 559 | 170 593 | 6 273 | 10 467 |
| 2001 | 163 155 | 317 878 | 87 382 | 207 051 | 3 222 | 5 479 |
| 2002 | 150 183 | 279 831 | 100 047 | 244 293 | 4 432 | 6 311 |
| 2003 | 199 381 | 353 784 | 131 403 | 225 963 | 3 212 | 3 809 |
| 2004 | 188 698 | 437 602 | 117 270 | 317 836 | 1 896 | 4 531 |
| 2005 | 197 843 | 350 762 | 130 936 | 368 023 | 1 730 | 3 333 |
| 2006 | 186 431 | 384 945 | 156 680 | 429 639 | 3 873 | 7 595 |
| 2007 | 154 793 | 294 502 | 146 988 | 303 950 | 12 934 | 29 604 |
| 2008 | 187 822 | 454 282 | 143 684 | 350 946 | 17 996 | 51 907 |
| P | 3,16 | 9,64 | 0,19 | 9,44 | 14,08 | 22,16 |

*Source: Calculation by authors based on data of the Statistical yearbooks of Serbia, relevant years, the Statistical office of the Republic of Serbia, Belgrade.*

Realized average yields of sunflower in the reporting period varied in the range from 1,5 t/ha in year 2000 to 2,4 t/ha in 2008. In production of soy bean, the lowest yield was achieved also in year 2000, only 1,2 t/ha, whereas the highest yield of 2,4 t/ha was achieved in 2008.

Production of sunflower and soybean is mainly realized on family agricultural households, and their share in the reporting period for sunflower production has increased from 59% in 2000 to 74% in 2008, and in soy bean production from 41% in 2001 to 61% in the last year of the analysis.

Violation/disruption of external price parities in the last year of analysis compared to previous year was to the detriment of producers of oil crops, due to constant rapid increase of input prices, which indicated some deterioration of their economic status (table 2).

*Table 2. Price parities for sunflower, soy bean and inputs*

| Products/inputs | Year | | | |
|---|---|---|---|---|
| | 2005. | 2006. | 2007. | 2008. |
| **Sunflower** | 1,00 | 1,00 | 1,00 | 1,00 |
| Sunflower seed | 110,00 | 163,33 | 71,33 | 99,17 |
| Mineral fertilizer NPK 15:15:15 | 1,15 | 1,20 | 0,66 | 1,31 |
| Mineral fertilizer UREA | 1,21 | 1,40 | 0,73 | 1,25 |
| Diesel fuel $D_2$ | 4,37 | 4,53 | 2,22 | 3,75 |
| **Soy bean** | 1,00 | 1,00 | 1,00 | 1,00 |
| Soy bean seed | 2,25 | 2,50 | 1,32 | 2,16 |
| Mineral fertilizer NPK 15:15:15 | 1,06 | 1,13 | 0,71 | 1,21 |
| Mineral fertilizer UREA | 1,12 | 1,31 | 0,78 | 1,15 |
| Diesel fuel $D_2$ | 4,04 | 4,25 | 2,38 | 3,46 |

*Source: Calculation by authors based on results of the survey conducted on family households*

Established price parities have caused increase in variable costs of the production and decrease of the realized gross margin in production of sunflower. However, thanks to relatively low prices of oil crops, realized gross margins are still relatively high, and considerably higher compared to their level recorded in the first reporting year (tables 3 and 4).

*Table 3. Calculation of gross margin in sunflower production*

| Elements | Years | | | |
|---|---|---|---|---|
| | 2005. | 2006. | 2007. | 2008. |
| Yield t/ha | 1,8 | 2,1 | 2,0 | 2,4 |
| Market price, RSD/t | 12.000 | 15.000 | 30.000 | 26.000 |
| **A) Production value, RSD/ha** | **21.600** | **31.500** | **60.000** | **62.400** |
| | | | | |
| **B) Material** | | | | |
| - seed | 1.320 | 2.450 | 2.140 | 2.380 |
| - NPK 15:15:15 | 2.760 | 3.600 | 4.000 | 6.300 |
| - UREA | 2.900 | 4.200 | 4.400 | 6.000 |
| - Plant protection preparations | 2.450 | 2.920 | 3.540 | 3.820 |
| - Diesel fuel | 4.725 | 6.120 | 5.985 | 8.100 |
| - Custom harvesting | 5.100 | 5.250 | 6.540 | 6.850 |
| **V) Total variable expenses** | **19.255** | **24540** | **26.605** | **33.,450** |
| **G) Gross margin G = (A-V)** | **2.345** | **6.960** | **33.395** | **28.950** |

*Source: Calculation by authors based on results of the survey conducted on family households*

*Table 4. Calculation of gross margin in soy bean production*

| Elements | Years | | | |
|---|---|---|---|---|
| | 2005. | 2006. | 2007. | 2008. |
| Yield t/ha | 2,8 | 2,8 | 2,1 | 2,5 |
| Market price, RSD/t | 13.000 | 16.000 | 28.000 | 28.000 |
| **A) Production value, RSD/ha** | **36.400** | **44.800** | **58.800** | **70.000** |
| | | | | |
| **B) Material** | | | | |
| - seed | 23.,504 | 4.800 | 4.440 | 6.720 |
| - NPK 15:15:15 | 2.760 | 3.600 | 4.000 | 6.300 |
| - UREA | 2.900 | 4.200 | 4.400 | 6.000 |
| - Plant protection preparations | 2.120 | 2.640 | 3.080 | 3.620 |
| - Diesel fuel | 4.725 | 6.120 | 5.985 | 8.100 |
| - Custom harvesting | 5.100 | 5.250 | 6.540 | 6.850 |
| **V) Total variable expenses** | **21.109** | **26.610** | **28.445** | **37.590** |
| **G) Gross margin G = (A-V)** | **15.291** | **18.190** | **30.355** | **32.410** |

*Source: Calculation by authors based on results of the survey conducted on family households*

## *2. Characteristics of industrial processing of oil crops in Serbia*

Privatization in this sector was finalized in year 2005, which has significantly contributed to inflow of investments, considering that new owners have invested into modernization of the processing facilities and improvement of the quality systems. There are in total nine industrial plants engaged in processing of oil crops in Serbia[3] Most of the industrial oil crops processing facilities are located in AP of Vojvodina.

Although in production of oil crops relatively high yield are realized (higher in comparison to majority of surrounding countries, as well as EU countries), primarily thanks to good natural conditions and long tradition in this production, satisfactory price competitiveness is not accomplished within the sector, since acquired advantage in production of oil crops is lost in the processing[4]. Mentioned deficiencies in the sector are eliminated with reduction of the oil price, so that competitiveness can be increased in the pre-accession period and to ensure certain stability to producers even after joining the EU.

3 Seven oil plants process sunflower, soy bean and rapeseed, whereas two process only soy bean. Single producer of bio-diesel is «Viktorija oil»-Šid. In addition to said capacities, there are also small plants for production of cold pressed oils (eight), as well as numerous extrusion plants as integral parts of agricultural companies and cooperatives producing livestock feed where principal component is soy bean..

4 Average utilization of installed capacities for processing of oil plants in Serbia (according ti data of MAFWM) is low, and in recent years it was 25-33%. Therefore, fixed costs per unit of final product are relatively high and increase considerably the price of oil produced in Serbia, i.e. the competitiveness of domestic oil on the international market is reduced.

Production of refined oils in Serbia in the analyzed period has increased from 69 to approx. 102 thousand tons, i.e. around 45% (table 5). Production in the oil sector in the recent period has ensured increased domestic consumption and certain quantities for export.

*Table 5. Tendencies in production of refined plant oils* in Serbia*

| | Year | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
| Production ( t) | 69986 | 84159 | 83108 | 88 571 | 101593 | 102659 | 108483 | 123386 | 101778 |
| Index(2000=100) | 100.0 | 120,3 | 118,7 | 126,5 | 145,2 | 146,7 | 155,0 | 147,7 | 145,4 |

* refined plant oils for consumption

*Source: Calculation by authors based on data of the Statistical yearbooks of Serbia, relevant years, the Statistical office of the Republic of Serbia, Belgrade.*

## *3. Economical relevance of the sector in the economical development of Serbia*

Value of the sunflower production was approx. 2,5 %, and of soy bean approx. 2% of Gross Agricultural Output of Serbia and marked increase of their share in the reporting period was registered (table 6). Share of rapeseed was modest and amounted to0.3% in 2008.

*Table 6. Share of the production value of sunflower, soy bean and rapeseed in Gross Agricultural Output-GAO*

| | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|
| Gross agricultural output-total* (000 000 EUR) | 2463 | 3270 | 3131 | 3623 | 3161 | 3378 | 3561 | 4493 |
| Share of the production value of sunflower (%) | 1,40 | 1,52 | 2,07 | 1,98 | 1,68 | 1,83 | 1,78 | 2,59 |
| Share of the production value of soyabean (%) | 1,02 | 1,51 | 1,48 | 1,60 | 2,06 | 2,36 | 1,89 | 1,93 |
| Share of the production value of rapeseed (%) | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,04 | 0,17 | 0,34 |

*- includes agriculture, hunting and corresponding services

*Source: Calculation by authors based on data contained in Documents of the Statistical Office of the Republic of Serbia.*

In the reporting period, share of the industry of refined plant oils and fats in Gross Value Added (GVA) of the food and beverage industry was maximum 7,7 % in year 2002. (table 7).

*Table 7. Share of the industry of refined plant oils and fats in Gross Value Added (GVA) of the food and beverage industry*

| | 2002 | 2005 | 2007 | 2008 |
|---|---|---|---|---|
| Gross Value Added (GVA) of the food and beverages industry (mil. RSD) | 43632 | 66997 | 90194 | 101087 |
| Gross Value Added (GVA) of the refined plant oils and fats industry (mil. RSD) | 3356 | 3966 | 3336 | 5325 |
| Share of the industry of refined plant oils and fats in Gross Value Added (GVA) of the food and beverage industry (%) | 7,7 | 5,9 | 3,7 | 5,3 |

*- refers all GVA companies

*Source: Calculation by authors based on data contained in Documents of the Statistical Office of the Republic of Serbia.*

Share of the industry of refined plant oils and fats in total employment within the food and beverages industry is approx. 3 %, with marked decrease of number of employees.

Since 2005, Serbia became a net exporter of agricultural and food products. In the structure of export of oil products, the most significant are sunflower and soy bean oil (raw and refined). Export value of these products considerably exceeds the import value. Share of these oils in the structure of total import of agricultural food products in Serbia has increased from approx. 2,0% in 2003 to 7% in 2008 (table 8). In the structure of export value of oils, refined and raw sunflower oils are most present (over 3% of total agricultural export), followed by soy bean oil (increase of share to over 2%), whereas the share of rapeseed, in spite of recorded increase, in the last year was 1,3% of total export of agricultural food products from Serbia.

*Table 8. Share of plant oils in the export and import of agricultural food products in Serbia, in the period 2000-2008*

| | 2000. | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|
| Export, total (mil. USD $) | 1558 | 1721 | 2075 | 2756 | 3523 | 4482 | 6427,9 | 8824,8 | 10973 |
| Total agro- food products | 295,6 | 316,7 | 534,1 | 584,0 | 800,1 | 924,4 | 1265,6 | 1685,8 | 1957,5 |
| Of which industrial plant oils (%) | 4,3 | 4,3 | 2,6 | 2,0 | 6,9 | 4,1 | 2,0 | 5,2 | 7,0 |
| Import, total (mil. USD $) | 3330 | 4261 | 5614 | 7477 | 10753 | 10461 | 13172,3 | 18553,6 | 22875 |
| Total agro- food products | 286,7 | 453,1 | 548,7 | 654,2 | 855,6 | 772,8 | 905,6 | 1122,1 | 1467,9 |
| Of which industrial plant oils (%) | 0,3 | 0,2 | 0,5 | 0,1 | 0,0 | 0,0 | 1,7 | 1,0 | 1,1 |

*- included are raw and refined sunflower, soy bean and rapeseed oils

*Source: Calculation by authors based on data contained in Documents of the Statistical Office of the Republic of Serbia.*

In addition, it is apparent that share of import of said oil types, after year 2005, when extremely low import value was recorded, mainly ranged around 1% of total import of agricultural food products (except in 2006 when it was 1,7%). The most significant import product in the sector of oil production is soy bean meal, with share of approx. 1% of import of agricultural food products in some years.

Export of sunflower oil is mainly directed towards CEFTA countries, whereas the export of soy bean oil is mainly directed towards EU countries. Due to lack of price competitiveness of these products on EU market, it is necessary to invest significant efforts to increase the efficiency of this production. Since 2004, export incentives for oil products were introduced (raw and refined oils, as well as soy bean products).

## Conclusion

Determined macroeconomic indicators indicate that the oil crop production sector has important role in total economical development of Serbia, and this is expected also in future period (subsequent to joining EU). However, in order to achieve these goals, corresponding supporting policy is necessary. In addition to direct support for producers, it can be achieved through investment incentives (for producers of oil crops in procurement of mechanization and irrigation systems, in order to increase the productivity, i.e. competitiveness; also for oil plants, investment incentives which would result in reduction of oil prices and solving of the environment protection issues). Through agreements with neighbouring countries, signatories of the CEFTA Agreement, it is necessary to ensure respecting of all agreed exchange rules and procedures. Also, it is important to ensure the support for the sector in negotiation processes within WTO, and EU accession.

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UDK: 637.5'4 (498)

# MANAGERIAL ASPECTS OF OBTAINING PORK IN ROMANIA

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## Abstract

*In the fight against poverty and world hunger, the most important issue for maintaining health, vitality and well-being of the human species is to provide animal protein. Thus, livestock - especially pigs - has gained a high share in ensuring the production of consumed meat, with variations from country to country. In Romania, pork is a product of basic food and in the consumer`s preferences, it occupies over 50% of the total consumption of meat. To ensure the necessary of pig meat, however, Romania has to import big quantities, situation detected in the European and national statistics.*

*In order to achieve the production level requirements, it opted for: the promotion of improvement in the direction of the pig carcass, stimulation of pig farms to associate in order to represent their interests in the relationship with suppliers of inputs and finished products beneficiaries and to ensure their income by making goods for the export production.*

***Keywords:*** *pork, management, strategy, farm*

## Introduction

In addition with the meat production provided, the pig (Table 1), is a laboratory animal being recognized as experimental model and being used for various scientific research in nutrition, genetics, breeding, behavior, surgery, and cosmic flight industry drugs and for the transfer of organs.

The advantages for the pig`s breeding are generated by their biological and economic characteristics like:

- it is an animal with less demanding conditions for feed and climate;
- omnivorous feeding→ can exploit a wide range of feed, food scraps, scraps of food, pumpkin, root vegetables, cereals;
- develops quickly, a week after doubling their weight at birth;
- a healthy sow, with properly feed, can produce piglets until the age of 6-7 years,

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while the girl 8 to 10 times (often 4-8 births);
• short gestation (114 days);
• prolificacy is high, from a single sow achieving approx. 20 fattened pigs per year;
• average daily weight gain per head is 500-700 g, so at 6-8 months, the pig may be sacrificed;
• slaughter yield is high (over 75).

Production processes, are constantly staggered throughout the year, can bring permanent income, which is important for business operators to ensure profits.

*Table 1 - the products resulted after slaughtered pigs and 100 kg*

<table>
<tr><td rowspan="8">The body (without gut content), 95 kg</td><td rowspan="5">Carcass, 75 kg</td><td rowspan="4">Meat 57 kg</td><td rowspan="2">Fat meat, 15 kg</td><td>Muscle, 3 kg</td></tr>
<tr><td>Fat, 12 kg</td></tr>
<tr><td rowspan="2">Lean meat, 42 kg</td><td>Muscle, 40 kg</td></tr>
<tr><td>Fat, 2 kg</td></tr>
<tr><td colspan="3">Boans, 7 kg</td></tr>
<tr><td colspan="3">Skin, 3 kg</td></tr>
<tr><td colspan="3">Head, hooves, 8 kg</td></tr>
<tr><td rowspan="2">Hair, blood, intestines, organs, 20 kg</td><td colspan="3">Comestible, 3 kg</td></tr>
<tr><td colspan="3">Noncomestible, 17 kg</td></tr>
<tr><td colspan="5">Intestinal content, 5 kg</td></tr>
</table>

The quantity of meat that is obtained from a pig depends on factors like race, sex, birth weight of piglets, slaughter weight, quantity and quality of the given feed, accommodation, animal density in the box, etc.. Thus, in Romania, pork production achieved in the last eight years, different variations (±) as seen in Table 2. It is found that the highest production was recorded during the period analyzed in 2003, but in 2009 decreased compared to 2003 meat production was 125,000 tons.

*Table 2 - The pig meat production in Romania*

| **Specification** | **2003** | **2004** | **2005** | **2006** | **2007** | **2008** | **2009** | **2010 9 months** |
|---|---|---|---|---|---|---|---|---|
| Total number of pigs, thousands heads | 5.145 | 6.495 | 6.622 | 6.815 | 6.565 | 6.174 | 5.793 | 5.423 |
| Total production of meat, thousands t | 710 | 626 | 605 | 618 | 642 | 605 | 585 | 303 |
| Medium weight, kg/ head | 111 | 105 | 103 | 113 | 113 | 114 | 113 | 105 |

*Source: Ministry o Agriculture and Rural Development from Romania*

In order to achieve the production level requirements, it opted for: the promotion of improvement in the direction of the pig carcass, promotion of pig farms association in order to represent their interests in the relationship with suppliers of inputs and finished products beneficiaries and ensure their income by making goods for export production, the size of commercial pig farms (according to the ordinance below) must be at least 100 animals per farm.

## Material and methods

In 2009, compared with 2008, the slaughtering of pigs in specialized industrial units (slaughterhouses) in Romania increased by 16.5%, while pork production increased by 20.6% (INS, Press Release no. 129/2010). Western development regions (more than 25.0%), South Muntenia Region (19.7%) and Southeast (15.8%) have recorded the highest percentage of slaughtering pigs. Romania needs to increase holdings of specialized pig, so that, based on domestic production, to reach the average European consumption, decreasing the meat imports, which affects the balance of trade of food products. Farms represent complex organizational forms of ownership, which use the land, animals and other means of production, interconnected in a unitary system, the execution of works, provision of services and achieving efficient products (EMERGENCY ORDINANCE no. 108 of 27 June 2001 on agricultural holdings). Regarding the breeding pig farms, they can be organized as a cooperative or type of associations or companies functioning as an open system and / or closed.
For example, the flow of production farming systems is as follows:

| **Closed circuit** | **Specilized farms** | **Holding** |
|---|---|---|
| Breeding maternity;<br><br>increasing youth fattening pigs | pig farm production (breeding, maternity, nursery, weaning);<br><br>fattening farms | associations or cooperatives of arable land, producing the necessary sources of feed;<br>FNC's;<br>weaned piglet production farms;<br>Youth farms;<br>fattening farms;<br>slaughterhouse;<br>supermarket network |
| *Exploitation system*: Extensive or household, semi-intensive and intensive industrial (≈ 100 days fattening period of acquisition of ≈ 25 kg piglets, with an average daily gain of 0.7 to 1.2 kg). *Pigs breeding in intensive and semi-intensive* system knows a continuous improvement in the desire to obtain an increase in the percentage of meat, an improvement in terms of quality meat (tenderness, water retention capacity), a shortening of the period from birth to delivery. | | |

The welfare for the animals in farms became compulsory by the Sanitary Veterinary Norm on 25 August 2006 regarding the minimum standards for protection of pigs.

The swine holding has many links with the market of raw materials, products

and natural environment, with the state and society. A functioning market economy, where production is for the market, its main objective is to obtain higher profit for the farmer which facilities the development of other activities, improvement of family living standards, as important economic agent in society.

Still, obtaining production involves a series of interdependent activities that take place, and that can be grouped in operations, depending on their nature and objective. They are supported by specialists under the following names: R & D, manufacturing, financial accounting, commercial, personnel and environmental protection.

The general objectives for research development operation are introduction of specialized species and modern technology for breeding and exploitation, choosing the most effective forms of cooperation and integration, development of mechanization, etc..

The activities included in the production operation are: to ensure the planned quantities of product, reaching the quality parameters established by the appropriate internal or external standards, to respect the deadlines for obtaining the products specified in the contracts signed with external and internal customers or favorable terms, lower products costs by rationing the consumption factors.

The objectives included in the commercial operation must focus on choosing the most advantageous suppliers, channels and markets, ensuring a superior quality for raw materials (feed, medicines) and maintaining product quality during transportation and products storage, etc..

Financial and accounting operation to ensure a smooth and continuous information on consumption, inward and outward factors and produced products, insurance funds and use them with maximum efficiency, proper execution of investments, etc.. Stimulation, monitoring personnel accountability and fairness, ensuring its motivation and proper working conditions, increase labor productivity and are considered the main objectives of personnel operation.

Reduction of environmental pollution and of negative influence for some toxic substances in the products that are consumed by humans are the major objectives and determine the choice of clean technologies, consumer compliance with certain raw materials, medicines, proper storage and use of manure, monitoring the quality of finished products during storage, etc..

## Results and discussion

Pig farm, as any trader, is based on the principles of market economy: the principle of autonomy of functioning and financial autonomy, autonomy of functioning, based on the property holdings of land, buildings, livestock and other assets (expressing their right to decide how to use them and their human resources, to specify the production systems, the manner of sale of manufactured products, etc..).

Financial independence includes the right entrepreneur to decide on the constitution and use of funds, the investment policy and calling the loans, their use. Decisions will be materialized in the development of its budget revenues and

expenditures and development programs.

Functioning and financial autonomy, involves full responsibility of consequences in terms of risk and uncertainty, and on the other hand, general regulatory compliance framework, specifically agriculture and livestock (the labor code, taxation, environmental protection etc..)

The principle of economic management requires that the action of attracting, allocating and combining factors of production, limit and combine them with the productions, to ensure maximum economic efficiency. This principle is reflected in increasing animal's prolificacy and annual index, of the average daily gain, labor productivity, profit and unit costs.

The principle of gravitation in the market activity is based around strong dependence between producers and consumers and as producer and pig farms is consumed, the market regulator that mediates these connections is because it provides information to answer questions like: What to produce? , How?, "When," Who? "What," When, "From whom? to buy or to eat, so the market is one that validates their economic decisions.

The principle of competitive advantage refers that any decision of the entrepreneur, faced with alternatives, is governed by the existence of an advantage compared with others, expressed by a lower opportunity cost for the product - pork.

The profitability principle expresses the obligation to obtain the maximum profit or a certain profit over a long period of time, the profit being the one that guarantees the existence of the holding capacity, development and its integration in the national economy.

## Farm management and farmer's attributions

Farmer's decisions are reflected both on daily activities (maintenance and feeding of animals with concentrates supplies) and of the seasonal nature (making processes, development of natural mating or artificial insemination, delivery of product), and adopt long-term decisions (which is more efficient production system, what type of construction to achieve and what type of machinery and equipment to buy, where to procure the necessary funds, and how to sell products to market, buy land, etc. .).

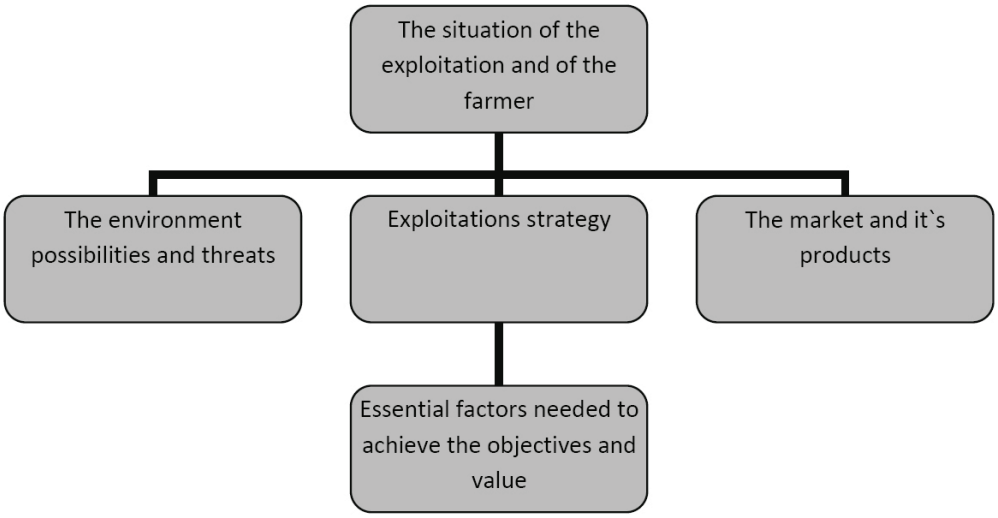
The main purpose in making these decisions is, of course, getting the maximum profit, and choosing the most effective combination of resources among products, between resources and products. Specifically, it is necessary, for example, to indicate the lowest cost combination between feed rations that make the combination the most profitable - or fat pig and piglets at 30 kg - for products intended for sale. Also, the farmer must know and to acquire administrative formalities regarding tax returns, tax or credit requirements, contracts with suppliers or customers, etc..

Specifically, the management of a farm is a complex which includes the planning, organization, command, coordination, monitoring and evaluation of economic activities within it, all of which are in fact management responsibilities.

Planning activities concerns the execution periods, and its purpose is to set

objectives, modalities of implementation (production systems, technology growth, planning forms and channels of products) and the distribution of funding, staff and equipment. At farm level, planning the activities at the beginning of each year are materializing in a production program and a budget of revenues and expenses. On the basis of production and consumption of resources planned to determine the level of income, expenditure and economic - financial results expected to be achieved. Developing production plan and budget revenues and expenditures is an activity that is intertwined technological knowledge, economic and legislative provisions. Long term planning is materialized in a strategy (Fig. 1), which includes strategic objectives, directions for achieving the necessary resources and time.

*Figure 1 – The strategy of swine exploitation*




According to these aspects, the strategy of a firm as a whole can be: recovery, strengthening and development, but may also target only certain areas - technology growth, upstream or downstream integration, diversification of production, improve product quality, reducing costs, marketing, etc. penetrate the foreign market.

The steps needed to develop the strategy are: detailing the mission and goals of the farm, analysis and diagnosis of internal and external environment, developing strategic alternatives, choosing to follow the implementation of tactical plans. The strategic objectives are materialized in the farms purposes, and are expressed by means of economic production and financial indicators: the herd and production, the level or growth rate of profits or turnover, etc.. Developing strategic alternatives include the establishment of alternative work to achieve the expected goals and objectives and specifying the criteria for evaluation of these alternatives: time to achieve the objectives, expenses or financial resources, human and materials, risks etc..

The alternatives to achieve strategic objectives may consider variations of production systems, of the breeding of animals technology, of species, upstream or downstream integration, improve product quality, mechanization etc.

## Conclusions

It is needed to increase the number of pigs in the specialized so that, based on domestic production, to reach the average European consumption. Swine breeders and meat processors and distribution networks of pork products from Romania, in order to achieve a higher level of efficiency and to be able to satisfy the requirements of the European Union for the meat industry, need an intelligent planning, monitoring and control, management and marketing. Strategic option is to choose from many alternatives developed to that which, by the evaluation criteria, leads to best results in relation to the purpose and strategic objectives formulated by the farm.

Alternatives to achieve strategic objectives may consider variations of production systems, the technology animal breeding, upstream or downstream integration, improve product quality, increasing mechanization of work, etc.

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UDK: 631.147 (498)

# THE INTENSIVE CAPITALIZATION OF THE ROMANIAN AGRICULTURAL POTENTIAL

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## Abstract

*This article emphasizes the high agricultural potential that Romania has and its low utilization. Even though Romania has terrains that can be used in agriculture, around 62% of the total country surface and has around 30% of the active population involved in agriculture, it is a net importer of agricultural products. Not only that, but the agricultural cultures have a high vulnerability to the evolution of the weather, the irrigational system and the level of mechanization being underdeveloped.*

*By increasing the use percentage of agricultural terrains and trough expanding the ecological farming, agriculture's contribution to the development of new working places, improving the commercial balance and the general stimulation of the economic growth will be increased.*

**Key words:** *agricultural exploitation, inelastic demand, The Common Agricultural Policy, ecological agriculture*.

## Introduction

Romania has 14.8 millions hectare of agricultural terrain, being the second largest agricultural producer from the East and Central Europe, after Poland. Out of the total, the arable terrains have 9423,3 thousands ha (64,7% of the country's agricultural surface), orchards 206,6 thousands ha (1,4%), vineyards 218,0 thousands ha (1,5%), and natural pastures 3330 thousands ha (22,6%)[1] . Under the aspect of the quality of the soils, Romania has the second place in Europe, and the population involved in agriculture represents about 30% of the active population, the percentage being very high compared to other European countries. Overall, 25% of the agricultural terrains have a superior quality, having a good and very good productive

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potential. From this point of view, Romania should be a country providing important amounts of agricultural products on the community market and outside of it. In reality, the performances obtained in these areas are modest, Romania being a net importer of agricultural products (in 2006, the import of foods and live animals was one of 25850 million euro, and the export totaled 40746 million euro[2]). Until 1989, Romania was a net agricultural exporter and became a net importer during the transition to the market economy period. This unfavorable evolution was caused by the decrease of the agricultural production, due to structural property reforms and the increase of the internal demand for more diversified products, and of a better quality.

## The agriculture's situation in Romania

In absolute sizes, out of the total agricultural surface of 14,8 million hectares, the arable terrains represent 10 million hectares, and an important part of these remain uncultivated. According to an evaluation made in November 2008, approximately 6.8 million agricultural hectares are uncultivated. One of the reasons would be that in the Romanian agriculture major changes regarding the structure of property, occupied population and the import-export relation, took place after 1989 and, even though there is a restructuring of the agricultural sector, the farm production still has a high degree of fragmentation.

Romania's agricultural surface has slowly decreased one year to another, mostly because of the transfer of the terrains towards constructions and the forest sector. By the year 2010, almost all the agricultural surface and over a third of the forest fund were privatized. The share of the small property is 66,5% of the country's agricultural surface, the old owners receiving their land back. The reduced sizes of the properties do not allow them to obtain an economic performance. In addition, they also lack capital. Most of the agricultural exploitations are for subsistence, the small owner not having the capacity of applying modern technologies of irrigation and soil fertilization, and to invest. An extremely important problem for Romania is the land improvement, because the agricultural terrains are affected by various factors that influence the production capacity, like frequent draught, soil's erosion trough water, frequent water excess in the soil, soil compaction due to poorly executed works, etc.

In these conditions, most of the agricultural exploitations are made for subsistence and have a low agricultural efficiency. For example, the wheat production per hectare is 3 times lower than in France or Germany, 2 times lower than in Poland or Hungary, and 36% smaller than in Bulgaria. High differences exist also in the case of potato culture's productivity: in Romania it's obtained an average production of 15000 kilos per hectare and in Belgium, USA, Holland, Germany, France and the Great Britain, 40000 kilos per hectare.

Romania is in an adverse situation in the meat sector, producing 47 kilos of meat per inhabitant, mostly pork – 47% of the total, and bird meat – 31%. This level of production places Romania in the last place of the European Union. Due to this situation, in 2008 meat imports were 13,7 times lower than the exports. Small productions of exported meat are mainly caused by the lack of abattoirs and deposit spaces with dissipated temperatures in the rural environment. Also, the precarious condition of the roads in the country side doesn't stimulate high investments in the rural environment. The highest percentage of the

meat production it's made for Romania's own community.
In all the regions of the country, the gross value added of the primary sector (agriculture, plus forestry and fish farming) is lower than the one from the secondary sector (industry plus constructions). The gross added values in the primary sector reflect the extremely low level of work productivity in agriculture, by reasons like poor technical endowment, scattered agricultural areas, almost non-existent management in private firms. In order to increase the economical efficiency, the association of producers in medium-sized agricultural units (50-100 hectares) is required, making possible certain investments, especially technological ones, the level of farming mechanization being very low in our country. Thus, Romania has one tractor per 54 hectares, compared to 13 hectares per tractor, the average level in the EU. Plus, 80% of the tractors are obsolete.

Besides the lack of machinery, the agricultural production also records high variations due to the climacteric factors that cannot be controlled by man. The bad weather reduces the production under the one planned by the farmers and good weather increases the production over the planned level. Unplanned fluctuations have direct effects.

Variations in the agricultural production determine the prices to fluctuate contrary to its sizes. An abundant production has as an effect the reduction of prices, and a weak harvest the increase of prices. Between the incomes of the farmers and the dimensions of the productions it's a direct and ascending relation when the productions are high and the climatic factors were favorable, and they drop when the productions are low.

Agricultural products usually have an inelastic request toward price and income, their modifications surpassing the request's modification. The higher the changes in prices are as the request is more inelastic. The reduced elasticity of the agricultural products means the request is lagging behind the offer, determining a drop of prices and agricultural incomes (profits).

## The Common Agricultural Policy reform and the development of the Romanian agriculture

Being a part of the European Union gives Romania a chance to benefit a common agricultural policy with a very generous budget. The incomes of the Romanian producers are afflicted by the Common Agricultural Policy of the European Union, a policy that has maintained the prices way above the market's level of balance. In order to prevent the afflux of imports attracted by the raised prices, all the agricultural goods that obtain financial support from the EU were subjected to a custom tariff. The high European prices are a factor that leads to producing more agricultural goods than it is needed for consumption. The agricultural producers are preoccupied with producing goods requested by the market, the Common Agricultural Policy being oriented towards satisfying the market's demands.

This agricultural policy is advantageous for the farmers in the EU, allowing them to obtain high incomes, but it's disadvantageous for the European consumers and the efficient foreign producers. The subsidized exports from the surplus of agricultural

products in the EU, competes with the offers of efficient producers from developed and under development countries, who can be easily ruined.

The main path trough which EU's common agricultural policy supports the farmers consists in fixing the prices of various agricultural products with specialized institutions. If the market's price drops under the limit, the intervention agencies buy the products surplus.

Agricultural prices in the EU are sustained by means like:

- the products stocking system
- the production share system
- the regulations on non-use of land.

According to the new orientations, the agricultural producers receive subventions that gives them a certain income stability if the produce quantities requested by the market and if their products meet the standards of food security and human welfare. They are interested in increasing the competitiveness given that an actual trait of the C.A.P. is the reduction of dependency between the volume of subventions and the volume of productions, a process called decoupling.

Among the new traits of the Common Agricultural Policy (C.A.P.) there are:

- ensuring rural development
- eliminating production quotas until 2013
- introducing a system of unique pays per farm
- conditioning subsidies for food safety, environment and animal care compliance.

The key areas for the evolution of the Common Agricultural Policy are:

- shift from price subsidies for agricultural products to income subsidies for the people in the rural environment
- eliminating the connection between the volume and structure of the production and the direct payments trough offering a unique aid per farm
- conditioning the subsidies to producing quality goods, increasing the surface of forest areas and respecting the animal welfare and environmental norms
- conditioning the grant of direct aid to respecting certain conditions like maintaining in good care the agricultural terrains, respecting the environmental, food safety, plant health and animal welfare standards

## Ecological agriculture, an alternative to the traditional agriculture

A method trough which the Romanian agricultural potential could be properly exploited is the ecological agriculture. Ecologic agriculture represents modern ways of growing crops and animals and producing foods, and it's fundamentally different from the ways specific to the conventional agriculture. The role of ecological agriculture is to produce better food for the human metabolism, while preserving and developing the environment and in correlation with the actions of the laws of nature.

The development of ecological agriculture is based on the existence of an essential connection between agriculture and nature. It doesn't mean influencing the

synthesis processes in order to maximize the efficiency of the agricultural products. To the development of the production of ecological good also contributes the request for agricultural products and the making of studies on the ecological agriculture.

Ecological products do not identify themselves completely with quality or natural products. The ecological agriculture minimizes the usage of internal origins factors in order to intervene in the synthesis process. This type of agriculture does not use growth stimulators, synthetic pesticides or forbidden systems of animal growing.

Among the objectives of ecological agriculture there are:

- decreasing pollution caused by growing crops and animals
- improving the soil's biological activity
- recycling vegetal and animal waste in order to give back to the soil some nutritive elements
- maintaining the soil's fertility on a long term
- increased use of the renewable resources in the local agricultural systems
- preserving the essential qualities of the products trough proper manipulation and processing
- preceding agricultural exploitations by conversion periods, with length variable according to the type of culture. The conversion period is 3 years for the perennial cultures and 2 years for the annual ones.

In order to practice ecological agriculture, certain rules must be followed:

- producing ecological crops trough direct soil exploitation, without using pesticides, fertilizers, etc.
- assuring optimal conditions of animal growing, the use of hormones being forbidden. Thus, large exterior surfaces must be made available for the animals.
- crop rotation
- keeping some natural predators, like spiders or birds, who contribute to pest control
- the acquisition of conformance certificates for the ecological products by the producers. In order for those certificates to be released, specialized inspection agencies control the compliance to the rules and principles of ecological products, the labeling mode, etc.

In our country, the ecological agriculture is practiced on small areas, mostly on research and vegetable production stations. The natural conditions and favorable resources require the expansion of this type of agriculture, contributing to the increasing use of the Romanian agricultural potential. On top of that, the Romanian farmer's traditional approach on agriculture, caused by the impossibility of making modern technological investments, is suitable for the ecological agriculture.

## Conclusion

The main problem that stops the Romanian agriculture from reaching its full potential is not the lack of natural resources, but the lack of technology, mechanization

and proper agricultural management. If these issues are solved, the work efficiency will dramatically improve, allowing the practice of an intensive agriculture with a high level of food production, in other words, a true agro industry.

Another solution is the ecological agriculture, who offers a market that pays good prices for the natural and healthier products. On top of that, trough practicing ecological agriculture, the biodiversity is protected, as well as the varied and beautiful natural landscapes that can be seen in different areas of our country.

Thus, agriculture's contribution to the creation of working places, the improvement of the commercial balance and the stimulation of the general economical growth, can be increased.

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UDK:316.334.2:111.62 EU

# SOCIO-ECONOMIC GAP WITHIN THE EUROPEAN UNION

*Camburu Vlad-George*[1]

## Abstract

*The article presents socio-economic development patterns in the European Union by analyzing sector economical agricultural indicators. The analysis is following a precise diagnostic of socio-economic development in the European Union.*
***Key words:*** *sector, agriculture, rural*

The attention of the European Union regarding the socio-economic development in its territory quantifies by rural and regional programs initiation, programs that are monitored with a well-defined frequency, by analyzing several indicators.

## Socio-economic development in the European Union

In the European Union, rural areas (predominantly rural and intermediate regions, as per NUTS 2 classifications) represented 90% of the territory and 56% of the population in 2006. The corresponding shares for predominantly rural areas were 54% of the territory and 19% of the population. Rural areas are therefore particularly important in terms of territory.

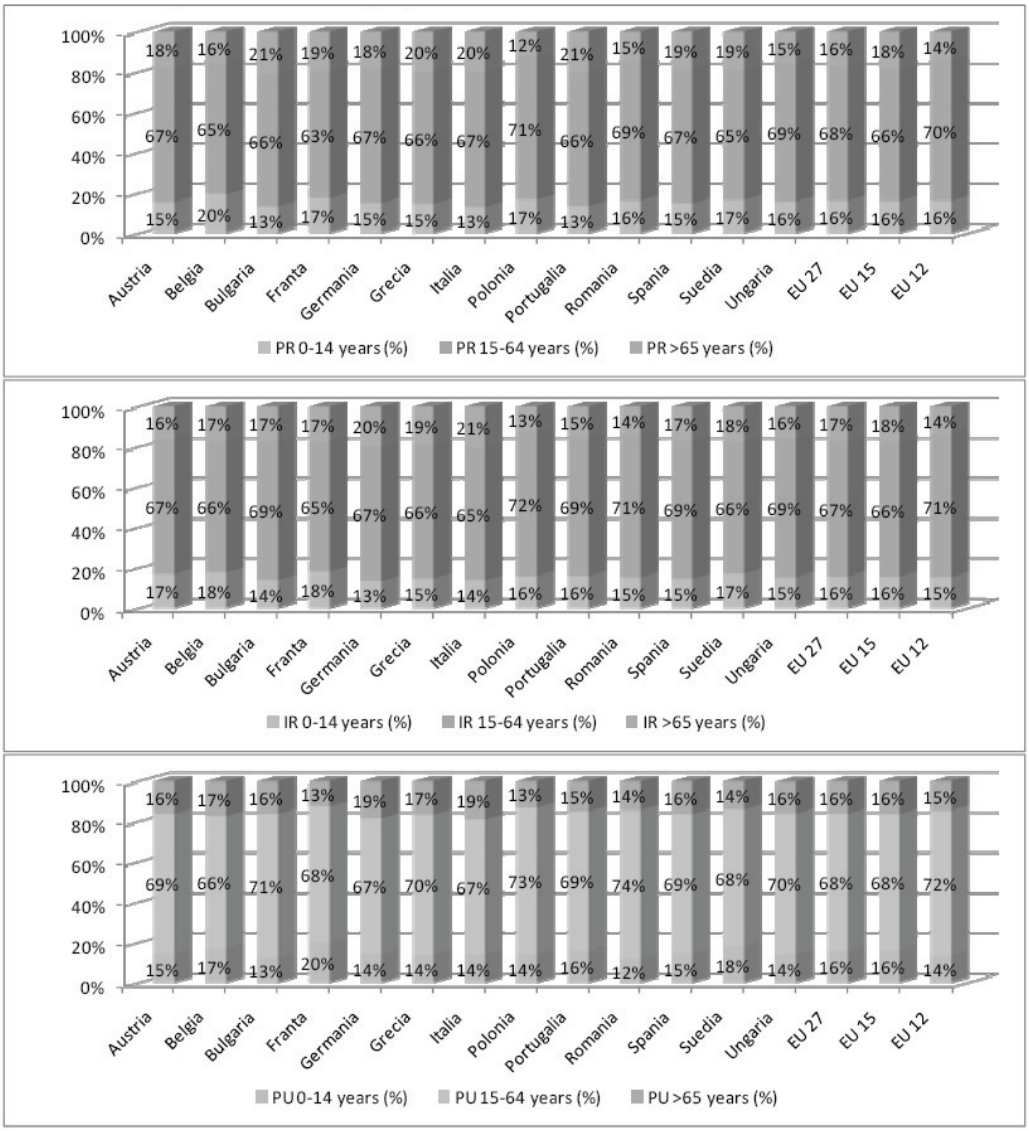
## Socio-economic situation in rural areas

In most rural areas, a first characteristic is the low level of concentration of the population: at European Union level, population density varies from 41 inhabitants/km² in predominantly rural areas to 561 inhabitants/km² in predominantly urban areas.

At European Union level, the age structure of the population does not vary significantly between different types of areas, as shown in Table 1. However, the share of population between 15 and 64 years old is always significantly higher in urban areas and the proportion of old people (65 years old and more) is often slightly higher in predominantly rural areas. It seems that age structure is more influenced by differences in demography between Member States.

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*Table 1: Age structure of population under NUTS 2 Classifications*




*(Source: Eurostat Database)*
*PR=predominantly rural, IR=intermediate rural, PU= predominantly urban

Income and inequality between regions but also between rural and urban have much to do.

Countries with low levels of economic development have relatively equal distributions of wealth. As a country develops, it acquires more capital, which leads to the owners of this capital having more wealth and income and introduce inequality.

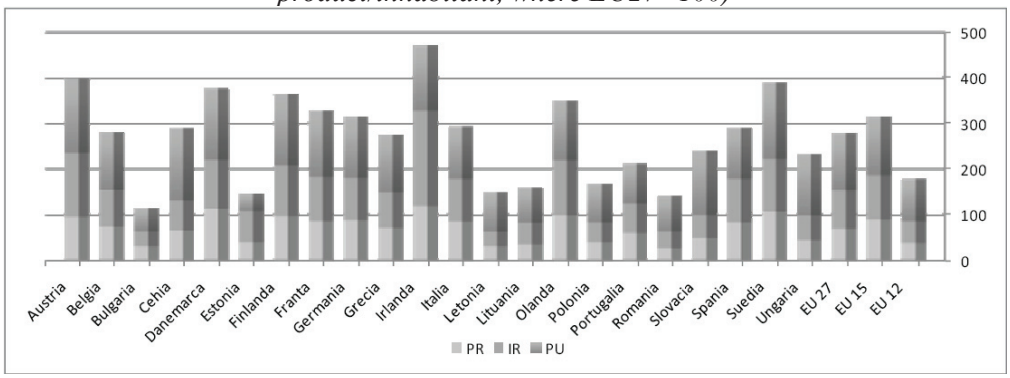
Population growth and technological change are often blamed for economic inequality.

Trade liberalization has had a measurable effect on the rising inequality between new and old EU member states. Increased trade with less developed countries and the fragmentation of the means of production resulted in low skilled jobs becoming more appealing.

At European Union level[2], the income per habitant is 21% to 62% lower in rural areas and generally increases with a higher urban character, as shown in Table 2 presented below. In the new Member States where the general level of income is less than half of the EU-27 average, the gap between predominantly rural areas and predominantly urban areas is accentuated. However, while the relative income per inhabitant in rural areas of the EU12 remained globally unchanged between 1999-2005, it has slightly improved in rural areas of new Member States (for predominantly rural areas, the relative position increasing from 34% to 38% of the EU average and from 41% to 48% for intermediate regions).

The solution for limiting development gaps might rely on various possible redistribution mechanisms such as social welfare programs or more developed countries moving back to lower levels of inequality.

*Table 2 Economic development in European Union member states (Gross domestic product/inhabitant, where EU27=100)*




*(Sourse: Eurostat Databse)*

The primary sector still represents 9% of the employment and only 3% of the gross value added in rural areas of EU-27. This situation is more marked in the new Member States, with the corresponding shares standing at 17% and 6% respectively. In general, even in rural areas, the majority of the economic activity depends more and more on the service sector. This trend should increase in the coming years as, between 2000 and 2006, the relative importance of the primary sector in the economy of the rural areas in EU-27 decreased by 4.2 percentage points in terms of

2 General Directorate for Agriculture and Rural Development – "Rural development in the European Union" – Statistical and economic information, http://ec.europa.eu/agriculture/rurdev/publi/index_en.html accessed at April 2-nd 2010, page 61

employment and by 1 percentage points in terms of value added.

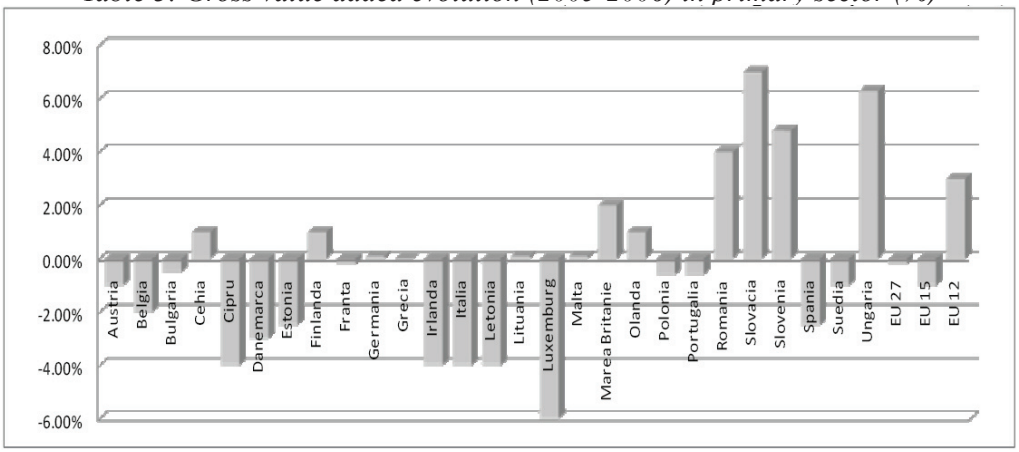
Although population growth is generally declining, it is unlikely that the majority of the rural population will be able to find adequate income and employment in the primary sector, in particular if education levels continue to rise.

The employment rate is slightly lower in rural areas for EU-27 as a whole (64.8% in predominantly rural areas against 66.5% for all areas in 2007). Development between 2000 and 2007 is different in new and old Member States. In EU-15, employment rate has generally increased more in rural areas than in urban areas, whereas in EU-12, rural areas are revealing lower increase of their employment rate or even a decrease (particularly significant in Romania). At EU-27 level, the unemployment rate (including long-term unemployment) is globally slightly higher in rural areas, but as for the employment rate, this is not observed in all Member States.

## Sector economic indicators

With around 12.9 mio. persons employed in 2006 in EU-27, the primary sector (agriculture, hunting and forestry) represented an important part of the EU economy in terms of employment: 6% for EU-27, ranging from 1% in United-Kingdom to 30% in Romania. In terms of gross value-added, the EU-27 primary sector reached around 179.5 bio Euros in 2006 and accounted for 1.7% of Gross Domestic Product, ranging from 0.4% in Luxemburg to 8.8% in Romania. Agriculture has always been a low-value-added low-income industry and for dimishing the economic gap between EU member states it is necessary to develop industry and services in rural areas.

*Table 3: Gross value added evolution (2005-2006) in primary sector (%)*




*(Sourse: Eurostat Database)*

The importance of primary sector in EU-27 is declining. Between 2000 and 2006, its share diminished by 1.2% in terms of employment and by 0.6% in terms of

gross value-added. The number of jobs decreased by 2.2% per year ranging from -9% in Poland and Romania to +4% in Luxembourg.

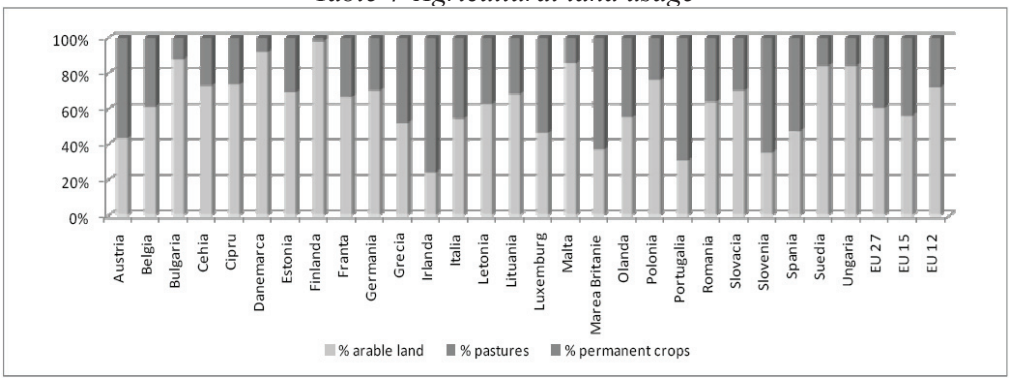
Urban areas have the advantage of economies of scale, while the terms of trade favour the urban areas as producers of industrial goods over the rural areas as producers of primary commodities.

## Agriculture

In 2007, agriculture utilized 172.5 mio. hectares in EU-27 of which 60.5% were dedicated to arable crops, 33% to permanent pastures and 6.4% to permanent crops. As the distribution depends mainly on natural conditions, there are major variations between Member States, as shown in Table 4.

In order to get to more clear results of the land usage, land multifunctionality and multipurpose land management strategies must be applied. The need to adapt land and landscape use to the new social, economic and ecological demands create different approaches for the primary sector between EU member states.

*Table 4 Agricultural land usage*




*(Sourse: Eurostat Database)*

There were 13.7 mio. farms in EU-27 in 2007, with an average size of 12.6 hectares, varying from 1 hectare in Malta to 89 hectares in Czech Republic. In general, farm sizes are higher than the average in EU-15 and lower in the new Member States (with the exception of Czech Republic). The total labor force in agriculture represents around 11.7 mio. annual work units for EU-27.

Seeing this, in order to diminish the gap between different EU regions, it is necessary that EU new members states focus on a broader spectrum of the rural economy (industry and services), not just on agriculture. The development of various non-farm activities offers great potential for creating additional rural jobs and hence for stimulating the further growth of rural economies. The establishment of rural-based industries, in particular, has often been very effective in creating new job opportunities and providing supplemental income. Diversified production and trade

activities have also offered rural communities better employment prospects and accordingly more stable growth of their economies, as seen in the more developed countries in the EU Region.

## Conclusions

From the indicator based analysis perspective, we can observe a high disparity between European Union New Member states compared to older Member States. A cohesion policy tends to diminish the gap between different regions, more precisely between less-favored regions and affluent ones. Financial solidarity and economic integration are main objectives for the EU future strategies.
Rapid economic development, income disparity between individual residents in various geographic areas have been continuously widening gap between urban and rural areas in particular.
Rural development programs initiated at European Union level are following to limit the disparity of socio-economic development between Member States and the life improvement in rural areas.
EU funds granted to new member states seem the right solution at the moment because it can lead to the industrialization and to the decrease of primary sector employment. However, the full absorption and efficient use of the EU Cohesion and Rural Development funds can create the premises for employment increase and diversification in the rural area. Funds are seen as an opportunity for the development of agriculture and of the rural area, as it might contribute to the increase of output, income and employment.

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UDK: 631.147/.155 (450)

# INTEGRATED PROJECT OF FOOD CHAIN IN THE PROTECTED AREA OF POLLINO

*Francesco Contò*[1], *Piermichele La Sala*[2], *Paolo Papapietro*[3]

## Abstract

*The introduction of the Integrated Projects of Food Chain requires the development of models capable of interpreting the dynamics of vertical and horizontal coordination between agents and the definition of the issues that mostly affect the ability of professionals to provide added value to goods and products and to acquire a competitive advantage in exchange.*

*With reference to setting up Local Production System of the Pollino - Lagonegrese, characterized by the development of an "atypical" food chain, for which the main factor of integration and competitive advantage lies in the strong link between companies and territory and in the social and economic value of the agriculture of protected area, this work focuses on the importance of the natural resources to the development of the food chain in the mountain region.*

***Key Words:*** *Food Chain, Protected areas, Rural Development, Integrated Project of Food Chain, Local Production System Pollino-Lagonegrese*

## Introduction

The agro-food industry is evolving towards new and complex forms of organization characterized by a greater degree of coordination, whether in the form of vertical integration of explicit or implicit contract between players of different levels of the food chain.

The causes of this structural and organizational evolution are related to different issues, whose weight greatly varies depending on the sector.

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However, the underlying driving forces may be due to three factors at least:

a) those related to changing consumption and therefore demand for food and agricultural products;
b) those related to the organization of the markets upstream and downstream supply the same products;
c) those related organization of the upstream and downstream markets of the agricultural sector.

Often, the common feature in many food chain is in the role played by farmers or, in general, by the agricultural sector, capable of reacting passively to stress imposed by other economic sectors without being a part. This is a datum that causes a loss of competitiveness of this stage of the process, frequently unable to innovate and to lay down rules according to what should be its "natural force" against an organization of food chain which is the engine: it's an agricultural world incapable to be the protagonist in exchange relations, which are important to survive in a market economy.

Therefore, the development of mechanisms becomes essential to capture value at first for the production phase in order to push and to increase competitiveness of the whole food chain. In order to reach this result it is important to start from the experience of Integrated Project of Food Chain (IPF) developed in the Rural Development Program (RDP) 2007 – 2013 in order to analyze as their contribution have defined a model of food chain basically in line with what happens in practice.

The analysis was conducted on an "atypical" food chain: the agro-territorial food chain of Pollino, located in the Local Production System forming Pollino - Lagonegrese and characterized by an aggregation or intersector umbrella which aims on quality and identity of local productions, for which the main factor of integration and competitive advantage lies in the strong link between companies and territory and in the social value and economic implications of agriculture in protected area.

## The Food Chains in The Protected Areas

The agriculture in natural areas, typically coinciding with the areas of hill and mountain, asks food chain integration models different from those typical of production systems characterized by intensive and specialized agriculture: specifically it speaks of zero distance, farmer markets, short chain and neighborhood. In particular it deals with models that can change the productive and socio-economic structures of territory, through the development of chain operations, that taking into account the specific context of industry and the relationships between actors in the chain, combines at the best the value chain resulting from calls for RDP in terms of territorial organization and governance of environment and territory, as a consumer.

It deals with food chain for which they were developed ad hoc calls to apply the RDP 2007 - 2013 the implementation of integrated projects aimed chain of protected areas and proximity:

a) The supply chains of protected areas are typically all-embracing specific to certain areas occupied mostly by parks (chains of protected areas), that focus

primarily on quality and characterized strongly territories within which these protected areas are located;

b) the proximity chains are aimed to bringing the smaller producers to market local (regional one), with specific reference to that of urban areas, including tourism ones.

In the first case, it is about chains – all-embracing or intersector – that point primarily on the quality and territorial identity of the productions for which the main factor of integration and competitive advantage lies in the strong link between companies and territory and in the social and economic value of Agriculture of the protected area.

In the second one, it can speak about agro-territorial chain that go beyond the classical approach for the sector, privileging multiple aggregation including in different sectors or in many marginal producers, whose interests can not be represented in the traditionally designed sectors, focusing on large specialized production and concentration of financial resources. For this chain, the objective is to reduce the distance from the market, overcoming the classical approach to the stages of transformation, distribution and marketing because of volumes and bargaining power which is different from those typical of other productive dynamics.

For these contexts, it is very important to combine the needs of biodiversity and multifunctional income and efficiency of the supply chain.

However, it remains open the question about the ability of these forms of organization of the supply chain in order to ensure, at local level, the increase of production income and the identification of regulatory mechanisms that can ensure greater quality certified to products at the benefit of producers and consumers.

## Integrated Projects of Food Chain in the Area of Pollino

The subject of this work is the area of forming "Local Production System of Pollino – Lagonegrese", including 27 municipalities, all in the province of Potenza, located in the south west of Basilicata at the border with Calabria and including full Basilicata side of the Pollino National Park. About the organization of local development, it is important to underline how the all territory is included in Lucan side of the Pollino National Park, except four municipalities. In the area three mountain communities insist that, pursuant to Regional Law (RL) n. 11/2008, will form a single Local Community including all municipalities of the area, coinciding with the area of the Integrated Territorial Project (ITP) Lagonegrese - Pollino.

In reference to the Program Leader, the whole organization falls - at least with reference to the programming period 2000-2006 - in a Local Action Group (LAG ALLBA).

The Local Production System was created with the aim of building through consultation, a network of local development actors in order to represent the interests, the quality and the potential of the territory and channel resources towards projects and leading sectors in the area. So not only agriculture sector, but also farm and food ones based on local products, trade, crafts and enhancement of cultural, natural and scenic goods.

Therefore the agri-food sector plays an important role in the local economy and it is increasingly emphasizing its multifunctional vocation about growing integration with other activities (such as crafts, services, tourism, etc..) that represents the decisive factor in setting environmental and territorial policies. However, the territorial structure, typically range, the low generation change, the pulverization of the companies is among the main factors that hinder the development of agriculture in this area.

For the area of Pollino, Integrated Planning of Food Chain has followed the path identifying the industry umbrella as defined in the notice published Explorative focused on implementation of Integrated Project of Neighborhood Food Chain and Protected Areas in 16/12/2009 by Basilicata Region.

Through the investigations carried out by administering questionnaires to sample firms that have participated in the activity of territorial animation with the aim of promotion of integrated plans of supply chain, they show the opportunity to make productive the system chains already activated in previous years and which are the economic base and productivity of local production system.

To this end, it have been identified as a goal the industry umbrella of the National Park of Pollino, implementing and developing the system of multi-sector supply chains that form the economic basis of local production system.

To this end it is important, at first, improving and restructuring of farms and processing, including through the introduction of innovations in production processes and adoption of new services to support the entire production system.

Specifically, the investigations undertaken in the studied area, demonstrate the importance of:

1.the implementation of the training for agriculture and forestry, promoting the acquisition of strategic skills;
2. the transfer of knowledge through the use of a farm advisory system established in the region in accordance with article 13 of Reg (EC) No 1782/2003;
3. the reduction of production costs, including through the introduction of innovations process and product optimization of production factors;
4. the improvement of the quality of agricultural products;
5. the increase of employment levels;
6. the structural adjustment of firms for participation in the quality systems;
7. the remuneration to the producers of the raw material base;
8. logistics and organizational processes;
9. the environmental performance of production processes in agriculture, food and forestry;
10. the diversity of sources income of agricultural households;
11. the promotion of the sustainable development of the supply and use of innovative energy sources.

Moreover, in order to benefit from the opportunity provided by the integration of component manufacturing with the territorial source of competitive advantage in an area such as that of the Pollino, it becomes essential to promote integration with other sectors of production and diversification of the Pollino system chain.

Thus, they were identified as specific objectives:

- the increase of product quality beyond the standard commercial product related to public health and welfare or environmental protection;
- the assurance of the traceability of products;
- the increase of the added value of primary agricultural products;
- the information given to consumers and business operators about the quality, the nutritional characteristics and methods of production of individual products;
- the creation of new employment opportunities in rural areas;
- the building of recreational facilities, small hotels and information centers;
- the training of new professional figures linked to the creation of employment opportunities in rural areas.

The verification requirements of the business of the Pollino National Park was conducted throughout the country, gathering with special needs in the summaries of the types of eligible investments and correlate with measures of RDP of Basilicata Region 2007/2013.

The survey, which involved more than 500 food businesses, showed a strong need for investment in business, many of them for the introduction of process innovations and product to improve the quality of agricultural products and increase employment.

The types of investment required are polarized, then, the improvement / construction of buildings and purchase of new machinery, equipment, including computer programs, and absorb about 45% of financial resources required.

This figure is to be interpreted in light of the monitoring of EAGGF ROP 2000-2006 and other community programs: the Pollino - Lagonegrese appears to be the region where child has been in relation to territorial extension and the presence of farms, flow of financial resources provided (only 4.8% of funds directed to the individual).

The motivations are to be found in both of the characteristics of agriculture, represented by small business infrastructure, which have objective difficulties of relationships and communications related to the orography of the territory and low infrastructural facilities, which have effectively limited the access to facilities and funding.

Finally, in order to complete the multi-industry sector of the Pollino National Park it has emerged the need for investment phase of processing, especially for the construction, upgrading or renovation of buildings for processing thereof. Concerning the marketing and processing of farm products, great importance has been given by operators of different sectors at implement opportunities that stage within the network of rural houses and farms.

Another important aspect is the introduction or reintroduction of products resulting from the varieties / cultivars with extinction. In fact it's very active in the Park a recovery and conservation of biodiversity of plants whose cultivation has been gradually diminishing over the years, to replace varieties with higher market demand. In this phase of revaluation of indigenous genetic it is necessary to exploit, both for reasons of environmental and landscape, and for the rediscovery of ancient recipes and culinary traditions.

Concerning actions to be implemented with the IPF, in relation to specific land, classified by the RDP as an area D1 - Area for agriculture with advanced organizational

models and the needs of the food industry, were identified - from companies surveyed - the activation of all the measures set out to tender the notice published exploratory, with different intensities.

In recent years, the activation by the Park of the aggregation processes between companies, has driven them to dynamic organizational models, however, affected by structural weaknesses, the presence of which inhibits a broader development chains themselves. This justifies the increasing demand in terms of financial, operations attributable to measures 121 - Modernization of agricultural holdings - and 123 - Adding value to agricultural products and forestry.

The measures most typically attributed to the diversification of the rural economy are also substantial in size (more than 30%), underlining the need for activation of integration processes, someone already established with other Community funding programs, aimed to improve the quality of life and develop the territory.

## The "atypical" food chain of the Pollino: the role of protected areas.

The role of parks and protected areas is fundamental to the revitalization and enhancement of agro-food chains in the inner areas. At the urging of the Park Authorities, Basilicata Region has recognized this point and it has considered advisable in the planning stage of the Integrated Projects of Food Chain, to satisfy needs of other areas of industry such as the Dies of Protected Areas; in order to enhance all aspects related to typical of a land (tradition, culture, health, authenticity, craftsmanship) succeeding thus to offer a response to economic development and small economies of protected areas.

The relationship between protected areas and farmers, as custodians of the undisputed land conservation, is vital because the landscape and environmental wealth of an area is closely linked to traditional agricultural activities in areas in which they are developed.

From the analysis conducted by administering questionnaires to sample of companies who participated in the process of animation for the promotion of Integrated Projects of Food Chain, come the following requirements:

- to promote and to encourage the development and testing of interventions for information, consultancy and training aimed at supporting agricultural enterprises and operators that are intended to experiment forms of aggregation and concentration of supply local production;
- to boost the incentive and the definition of good agricultural practices and environmentally sustainable production techniques in order to rehabilitate and develop the products that come from a protected area or adjacent areas;
- to provide effective training and updating activities aimed at improving professional skills related to agriculture (operators, technicians) on the basis of new economic opportunities given from the development of organic farming and local products of high quality and well from economic activities related

to sustainable development (host farm, rural sports, environmental guides, processing and marketing local products, etc..);

- to facilitate and to encourage communication activities about the market, referring to production techniques and the typical characteristics of products that come from a protected area;
- to use the financial opportunities and Pacts in the existing system of protected areas favoring market trends;
- to promote actions in support of the local driving sectors through the creation of new skills free (organic, non-farming activities and tourism, etc..) that are able to support change processes in place and to avoid marginalization of local agriculture that presents inadequate skills;
- to consider a park as a source of real economic opportunity, because the development of marginal areas can benefit enormously of proper and respectful use of environmental resources, making each other functional in order to carry out the objectives of economic and social growth through agriculture;
- to maintain the economic role of protected areas through assimilation to Local systems of environmental goods as part of financial planning for local development.

Agriculture plays the main strategic role in protected areas, because it is capable of offering goods to meet a growing demand for products with high content in environmental, healthy and quality. From this point of view protected areas suffer from a condition of poor promotion and support from locally and nationally economic and financial programming.

Therefore it needs to reverse this trend in the direction of greater exploitation of local resources.

Institutions located in protected area management, in that sense, play a strategic role, especially in relation to an increased ability to coordinate actions and instruments put in place in order to make more comprehensive and effective the development process and primarily it is the Park Board that assume the decisive role in programming, planning and management of the area. In this respect it also seems important the use of the development model of industrial districts in order to revitalize local development in protected areas. From this point of view, it is significant the work of the National Park of Pollino that defines development strategies regarding the opportunities arising from structural policies European Union 2007-2013 and developed by regions of Basilicata and Calabria. For this reason, it is also important to establish a partnership in support activities and technical assistance aimed to enhance the effects of intervention in favor of local populations and the Environment - as well as the birth of the Local Production System Pollino-Lagonegrese currently undergoing approval by the Basilicata Region.

In fact it seems important, encourage and enhance those prevailing socio-economic systems of rural character, typical of the marginal areas inside, that they find the appropriate conditions for the development in its rural condition, guaranteed and protected by the actions of environmental protection. In this way, the economy of these areas would rely their bases in a relationship of mutual dependence between the

different economic sectors (agriculture, tourism, services, etc.) and society.

These activities have ensured the maintenance of the area over time and they were key component for the Protection hydro-geological, they allowed the maintenance of infrastructure and thus the usability of the territory, they have handed down and observing cultures, knowledge, traditional products that are among the values most important of our region and those on which it points to build a better supply planning.

The multifunctionality of the agriculture is, therefore, the main strategy to be pursued for the recovery of agricultural land, including identifying foster care farms to important tasks and environmental protection, from one hand, in order to create alternative sources of incoming and thus improve the welfare of rural populations, from the other hand in order to promote sustainable development, care and maintenance of the rural environment, management and environmental protection and landscape enhancement of the special features products and the relationship between product and territory.

## Conclusions

Regarding the agro-food industry, there is a growing awareness that the forms of vertical coordination is an important strategic lever to cope with changes in a scenario of increasing competition, because of globalization, the rapid spread of new technologies, the huge changes in the structure of consumption of food, which, although declining in quantitative terms, are characterized by the demand for a greater variety of products and increased consumer expectations for quality, and changes taking place in institutional framework.

The quality and technological innovation become very important for vertical relationships, particularly in some areas, very much influenced by the relationship between raw material suppliers, processors and distributors. The necessity of developing long term relationships, according to well-defined sector strategies aimed at achieving common objectives in terms of value and competitive advantage, assumes, ultimately, particular emphasis for the agro-food business. This is especially true in a chain called "atypical" as that of the Pollino, where companies are very careful to pursue quality and distinction in terms of strategic positioning and where the link with the territory and with stakeholders in the agro-food local is much more important than in other cases, or in cases where the preferences and eating habits are moving increasingly from the simple nutritional needs to the increasingly request of products differentiated by quality, safety, information and the more value added content.

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SI – 2
UDK: 631.67:633.15:613.1

# MANAGEMENT IN IRRIGATION OF CORN HYBRIDS VARIOUS MATURITIES GROWN IN CLIMATIC CONDITIONS OF SERBIA

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## Abstract

*Climatic conditions with uneven amounts and variable distribution of rainfall during growing season affect considerably yield performance and stability of crop production. Such conditions are present in Serbia, where droughts of various intensities occur in 80% of the years.. Due to such conditions, corn yields are highly variable from year to year which occupies around 40% of the total arable land.*

*The average yield of irrigated corn was 13.05 t/ha, but of non irrigated corn 11.14 t/ha. The effect of irrigation was thus 17%. The highest irrigation effect, 33%, was registered in 2007 and 2003 when the largest amount of irrigation water was applied. Regarding the maturity group, highest effects were registered in the FAO groups 500 and 600, 20%, and lowest effects were seen in the groups 300 and 400, 16 and 13%, respectively. Early corn hybrids mature in late August or early September and they avoid effects of drought that almost regularly occurs in August. With the later-maturing hybrids, the irrigation practice increased the yield by about 1 t/ha on average.*

*Key words: irrigation, drought, corn hybrids, climatic conditions, maturity grown.*

## Introduction

Corn is the most widely grown field crop in Serbia. Its average acreage is about 1.3 to 1.5 million ha or about 40% of the total arable land. The average yield in the period 1965-2003 was 5.08 t $ha^{-1}$, with a large range of variations from 2.26 to 7.11 t $ha^{-1}$. A high percentage of corn acreage is non irrigated. Corn is the main

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crop in irrigated crop rotations. In irrigation systems in the Vojvodina Province, corn yields are high and stable. They are regularly over 10 t $ha^{-1}$, and may exceed 12 t $ha^{-1}$ (Maksimović et al., 2004).

For normal growth and development of corn, its high and stable yields and high quality it is necessary to maintain optimum soil moisture throughout the growing season. Only optimum conditions permit the plants to use water according to their needs, i.e., to the level of potential evapotranspiration (ETP). Effect of irrigation on corn yield performance depends on weather conditions in the year of growing, primarily on the amounts and distribution of rainfall. It may be very high in dry years, while in humid years it is modest or missing al together (Bošnjak and Pejić, 1998).

Serbia has a moderate continental climate where meteorological conditions typically vary from one year to another. Annual rainfall is particularly variable, regarding both, its amounts and distribution. Drought occurring each year and causing large or small reductions in crop yields (Dragović et al., 2004). Vučić (1989) pointed out that, in the Vojvodina Province, the probability of receiving the rainfall at the level of potential evapotranspiration (ETP) of the crops grown is only 4-5%, and therefore, cultivars and hybrids cannot be expected to realize their high genetic yield potentials.

Analyzing climatic conditions in a period of 80 years, 1924-2003, Dragović et al. (2005) concluded that with respect to average ETP in July and August of 100 mm, 67 years or 83.7% were dry in July while 69 years or 86.2% were dry in August. Of course, many other factors affect the intensity and duration of drought such as soil properties, cultivation practices performed and crop tolerance to drought. The high yielding corn hybrids cannot realize their genetic yield potential because the rainfall limits their phyto climatic yield level (Bošnjak et al., 2005).

The objective of this study was to determine the effect of drought and effect of irrigation on yield performance of corn hybrids from different FAO maturity groups.

## Material and method

Experiments were conducted in the location of Rimski Šančevi, at the experiment field of Institute of Field and Vegetable Crops, Novi Sad, on the loamy calcareous soil, in the period 2003 – 2007. The trial established in a block design and adapted for sprinkling irrigation, included an irrigated variant (60-65% of FWC) and the non irrigated control variant. Irrigation was scheduled on the basis of soil water dynamics measured sequentially in 10-20 cm soil layers to the depth of 60 cm, by the thermo gravimetric method at 10-day intervals or at shorter intervals if necessary. At the beginning and at the end of corn growing season, soil moisture was measured to the depth of 2 m to calculate the consumption of water from pre-vegetation soil reserves. Meteorological data for rainfall and air temperature were obtained from Rimski Šančevi meteorological station, which is located within the experiment field of the Institute.

The trial involved corn hybrids from different FAO maturity groups: 300, 400, 500 and 600. The size of experimental unit was 35 $m^2$. Harvest was performed manually

at technological maturity and yield was calculated in t $ha^{-1}$ on 14% moisture basis. Up to date cultivation practices were performed in the trial, at optimum dates.

The obtained data on yield performance were subjected to the analysis of variance for the three factorial trial. The results were tested by the LSD test.

## Results and discussion

**Climatic conditions.** In corn production, irrigation efficiency is determined by weather conditions, i.e., the amount and distribution of rainfall and air temperature. While air temperature is less prone to variation in time and space, oscillations of seasonal rainfall in relation to average values are quite pronounced. Yield level depends on the intensity of rainfall deficit and the time and duration of dry period (Dragović et al., 2003).

Rainfall sum and rainfall distribution per month during corn growing season differed significantly in the experiment years. The 5-year average sum was 400 mm, the sums varying from 236 mm in 2003 to 539 mm in 2005. The year 2003 was exceedingly dry and it had an unfavorable distribution of rainfall from the point of crop production (Table 1). Corn had to be irrigated throughout the growing season. The years 2004 and 2005 had significantly higher rainfall sums (442 and 530 mm, respectively), and these rainfalls were distributed more favorably for the corn crop. The latter sums were above the long-term average (Table 1). The precipitation was particularly high in 2005, 376 mm during the winter season and 530 mm during the growing season, totaling 906 mm for the hydrological year, which is near the absolute maximum for the studied region.

*Table 1. Mean monthly precipitation during growing season (mm)*

| Year | Month | | | | | | Total |
|---|---|---|---|---|---|---|---|
| | Apr. | May | June | July | Aug. | Sept. | |
| 2003 | 4 | 23 | 31 | 60 | 30 | 84 | 236 |
| 2004 | 112 | 89 | 97 | 63 | 39 | 42 | 442 |
| 2005 | 33 | 38 | 135 | 123 | 134 | 67 | 530 |
| 2006 | 66 | 70 | 104 | 31 | 125 | 24 | 420 |
| 2007 | 0 | 99 | 71 | 39 | 80 | 79 | 368 |

As air temperature affects significantly the intensity of evapotranspiration, and therefore the irrigation schedule of corn, we analyzed the monthly average air temperatures (Table 2). The average air temperature for the growing seasons of 2003-2007 was 18.5 ºC, ranging from 17.3 to 20.0ºC. The long-term average for growing season in this region is 16.8ºC. In July and August, however, maximum daily temperatures exceed 30 ºC, frequently going above 35 ºC.

*Table 2. Mean monthly temperatures during growing season (°C)*

| Year | Month | | | | | | Mean of growing season |
|---|---|---|---|---|---|---|---|
| | Apr. | May | June | July | Aug. | Sept. | |
| 2003 | 10.9 | 20.6 | 24.0 | 22.6 | 24.6 | 17.2 | 20.0 |
| 2004 | 9.1 | 15.2 | 19.8 | 21.9 | 21.7 | 16.3 | 17.3 |
| 2005 | 11.7 | 17.0 | 19.3 | 21.1 | 19.4 | 17.2 | 17.6 |
| 2006 | 12.7 | 16.6 | 19.7 | 23.5 | 19.7 | 17.9 | 18.3 |
| 2007 | 13.4 | 18,6 | 22.0 | 23.2 | 23.0 | 14.6 | 19.1 |

Besides the amount and distribution of precipitation and high temperatures, the number of tropical days, i.e., days with a maximum temperature over 30°C, affect the irrigation requirements. In the parts of Serbia where droughts are most frequent and most severe, there were 35 tropical days per year on average in the period 1970-2003 (Dragović, 2005). The number of tropical days per year increases by 1.28 days annually, showing a sharp increasing trend (Figure 1).

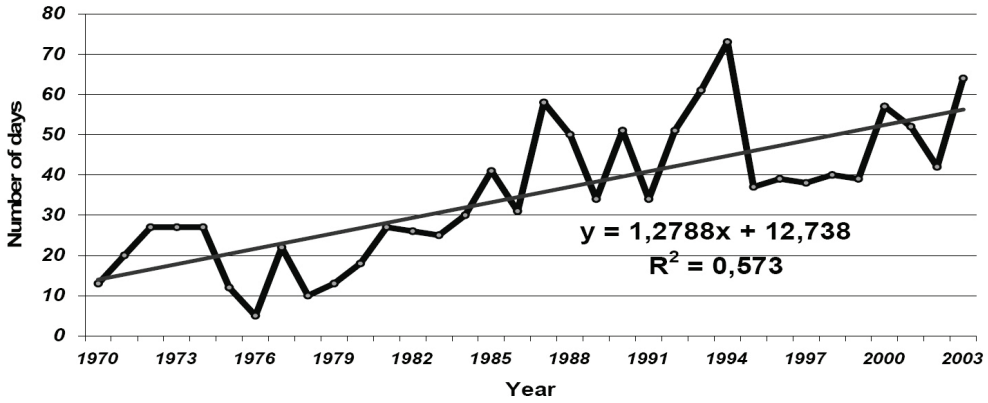



*Figure 1. The number of tropical days (maximum temperatures over 30°C)*

**Water requirement and irrigation.** Corn yield decreased in proportion with the decrease in available soil water during July and August, which shows how risky it is to grow corn in dry farming under the climatic conditions of Serbia. Because the critical periods of corn growth and development coincide with the periods of most intensive drought in the Vojvodina Province, corn yield level is highly correlated with the amount and distribution of rainfall during that period, (Dragović, 2000).

*Table 3. Irrigation schedule and rate (mm), and irrigation requirement (mm)*

| Year | Irr. date | Irr. rate (mm) | Irr. requirement (mm) |
|---|---|---|---|
| 2003 | 30 April<br>5 May<br>5 Jun<br>20 Jun<br>5 July<br>27 July | 30<br>20<br>60<br>60<br>30<br>30 | 230 |
| 2004 | 2 July<br>17 July | 40<br>60 | 100 |
| 2005 | 25.Jun | 60 | 60 |
| 2006 | 6 July<br>17 July<br>28 July | 60<br>60<br>60 | 180 |
| 2007 | 21 Jun<br>19 July<br>31 July | 40<br>60<br>60 | 160 |

The average water requirement of corn grown under the agro-climatic conditions of Serbia is 478 mm, varying from 450 to 550 mm in dependence of actual weather conditions.The average daily ET of corn is: 1.0 mm in April, 1.0-2.3 mm in May, 4.0-4.3 mm in June, 3.5-4.0 mm in July, 3.5-4.0 in August and 1.8-2.0 mm in September (Dragovic et al, 2007). There are authors who claim that the average daily water requirement of corn ranges between 5 and 10 mm.

In this study, supplementary irrigation was used to maintain an optimum level of soil moisture throughout the corn growing season. In the irrigated variant (60-65% FWC), 330 mm of water were added in six irrigations in 2003. As the 2004 and 2005 distributions of rainfall were much more favorable for corn growing, only two irrigation had to be performed in 2004 and one irrigation in 2005 (Table 3).

**Yield.** The highest yield in the trial, on average for the irrigated and nonirrigated variants, was achieved in the FAO maturity group 600. It was statistically highly significant and it amounted to 12.66 t $ha^{-1}$ (Table 4). The lowest average yield for the irrigated and nonirrigated variants, 10.85 t $ha^{-1}$, was obtained in 2003, which was exceedingly warm and dry. Extremely high mean daily air temperatures in the last third of July (23.6$^{o}$C) and in August (24.6$^{o}$C) caused a premature end of the growing season. The highest yield of irrigated corn, 14.68 t $ha^{-1}$, was achieved in 2007. That year had balanced temperature conditions and a moderately low rainfall throughout the growing season (368 mm). Drought occurred early, at the beginning of June, and it lasted till the end of July. Three irrigations were performed during the growing season, totaling 160 mm of irrigation water (Table 3). In the same year, the dry farmed corn produced had a lower yield (11.08 t $ha^{-1}$), which was highly significantly below the yields obtained in 2007. The effect of irrigation on the yield was high in that year, amounting to 32.50%.

*Table 4. Yields of corn per maturity group and test year ( t/ha)*

| Year (A) | Irrigation (B) | Maturity group (C) | | | | |
|---|---|---|---|---|---|---|
| | | **300** | **400** | **500** | **600** | |
| **2003** | Control | 9.24 | 10.00 | 9.31 | 9.20 | 9.44 |
| | Irrigated | 11.71 | 11.49 | 12.76 | 13.06 | 12.26 |
| | **Average** | **10.48** | **10.75** | **11.04** | **11.13** | **10.85** |
| **2004** | Control | 11.00 | 10.21 | 11.27 | 11.95 | 11.11 |
| | Irrigated | 12.07 | 11.65 | 12.30 | 14.25 | 12.56 |
| | **Average** | **11.53** | **10.93** | **11.78** | **13.10** | **11.84** |
| **2005** | Control | 11.70 | 12.55 | 13.77 | 12.74 | 12.69 |
| | Irrigated | 12.32 | 12.11 | 13.72 | 12.44 | 12.65 |
| | **Average** | **12.01** | **12.33** | **13.74** | **12.59** | **12.67** |
| **2006** | Control | 10.98 | 10.96 | 11.00 | 12.53 | 11.37 |
| | Irrigated | 12.53 | 12.37 | 13.27 | 14.18 | 13.09 |
| | **Average** | **11.75** | **11.66** | **12.14** | **13.36** | **12.23** |
| **2007** | Control | 10.00 | 11.60 | 11.43 | 11.31 | 11.08 |
| | Irrigated | 13.10 | 15.03 | 15.62 | 14.97 | 14.68 |
| | **Average** | **11.55** | **13.31** | **13.52** | **13.14** | **12.88** |
| **Average (BxC)** | Control | 10.58 | 11.06 | 11.35 | 11.54 | 11.14 |
| | Irrigated | 12.35 | 12.53 | 13.53 | 13.78 | 13.05 |
| | **Average** | **11.46** | **11.80** | **12.44** | **12.66** | |
| **LSD** | **A** | **B** | **C** | **AxB** | **AxC** | **BxC** |
| **0.01** | 0.518 | 0.328 | 0.463 | 0.733 | 1.036 | 0.655 |
| **0.05** | 0.392 | 0.248 | 0.351 | 0.554 | 0.784 | 0.496 |

Effect of irrigation may be high in dry and warm years while it can be low or absent in humid and cool years Bošnjak et al. (2005) reported that the yield of irrigated corn was increased by 28.7% in the period 1988-2003, with annual variations from 2.4 to 72%.

On average for the irrigated and nonirrigated variants, highly significant differences in yield performance were found in all maturity groups (FAO 300 - 16.73%, FAO 400 - 13.30%, FAO 500 - 19.20%, FAO 600 - 19.41%) (Table 4).

In 2007, the maturity group 500 had the highest yield in irrigation (15.62 t $ha^{-1}$). That yield was highly significant in relation to the group 300 and significant in relation to the groups 400 and 600. In dry farming, there were no statistically significant differences among the groups. The differences in yield obtained with and without irrigation were mainly due to the differences between potential and actual evapotranspiration of corn.

## Conclusion

On the basis of the results obtained in the field trial on the effect of irrigation on yield performance of corn hybrids of different maturities grown under different climatic conditions of the year, it was possible to draw general conclusions on the effect of variable weather conditions on the effect of irrigation on corn production..

The irrigated corn produced highly significant yields in relation to the dry farmed corn. In the study period, the effect of irrigation on corn yield was 2.91 t $ha^{-1}$ or 17% on average. The highest yield (15.62 t $ha^{-1}$) was obtained in 2005, in irrigation, in the maturity group 500. The lowest yield (9.20 t $ha^{-1}$) was obtained in 2003, in the non irrigated variant, in the maturity group 600.

Irrigation schedule and frequent irrigations with water rates of 40-60 mm tend to manage not only the soil water regimen but also the microclimate inside the crop stand, which directly affects the yield performance of corn.

The significantly higher yields of the irrigated corn are an indication that, under varying climatic conditions, high and stable yields of corn may be achieved only in irrigation.

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UDK: 353.1:631:330.13.7

# REGIONAL ASPECT OF CONSEQUENCES OF WORLD ECONOMIC CRISIS IN AGRICULTURAL SECTOR

*Snežana Đekić*[1], *Sonja Jovanović, Snežana Radukić*

## Abstract

*As stated in the draft of National Program of Agriculture in Serbia from 2010 to 2013, ,,agriculture has been recognized as one of the main strategic directions of development, as majority of the population, both rural and urban, see it as the greatest development opportunity of Serbia". The main characteristics of Serbian agriculture for many years, and also its main problems are: volatility of yield and production volume, slow moving towards extensive agricultural production, low purchasing power of farmers as a result of low incomes in agriculture, price disparities, insufficient agricultural budget which is one of the lowest in Europe, and the increased number of elderly households in rural areas as a result of reduced number of farmers. With the advent of the economic crisis, many of these problems have deepened. In this paper, we analyzed the global economic crisis through several indicators: participation of the budget for agriculture in the overall budget of the country, foreign trade in the agricultural sector, and wages in this sector. Compared to Croatia, Slovenia and the European Union, it was noted that Serbia significantly lags behind these countries. However, forecasts and planned investments in agriculture provide an opportunity to alleviate the negative development trend of agriculture in Serbia.*
***Key words :*** *crisis, the agricultural sector, wages, credits, agricultural budget.*

## Consequences of Global Economic Crisis in the Agricultural Sector

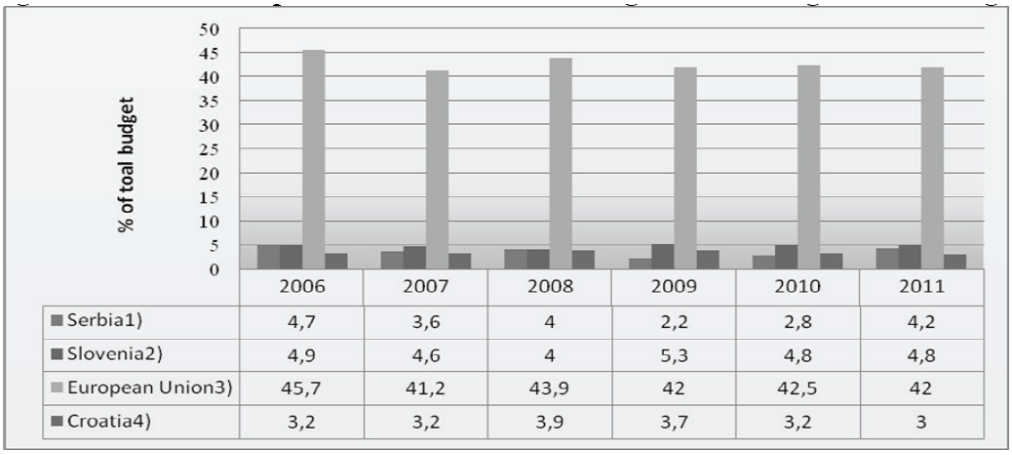
As a result of the global economic crisis and reduced interest of foreign investors, the value of foreign investment in 2009 declined dramatically. The negative effects of the global economic crisis became evident when comparing the first six months of 2009 with the same period in 2008. Gross and net inflow of foreign investments has decreased by 75% in 2009. In addition to foreign investment, the level of domestic investment has also decreased. The economic crisis affected the agriculture sector where reduction

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in investment is evident, as well as reduced availability of financial resources, and reduced predictability in the business.

**Budget allocation for agriculture** in conditions of crisis is of great importance. One of the reasons for that is in generally difficult access to finance for investment, as well as in support in the environment that makes business and distribution difficult. The budget for agriculture in Serbia is very modest, and in the crisis period it is nearly halved. In budget revision for 2009, the budget for agriculture amounted to 2.2% of the total budget compared to the 2008 when it was 4% of the total budget. In 2010, agricultural budget has been increased, and predictions are that in 2011 it will amount to 4.2% of total budget spending. Reasons for increased agricultural budget are: *the need to increase the competitiveness of agriculture, investments in rural development including environmental protection, the need to increase support to agricultural producers, which is on a very low level in comparison to competing countries*.[2]

*Figure 1. Achieved and planned level of share of the agricultural budget in total budget*




| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|
| Serbia1) | 4,7 | 3,6 | 4 | 2,2 | 2,8 | 4,2 |
| Slovenia2) | 4,9 | 4,6 | 4 | 5,3 | 4,8 | 4,8 |
| European Union3) | 45,7 | 41,2 | 43,9 | 42 | 42,5 | 42 |
| Croatia4) | 3,2 | 3,2 | 3,9 | 3,7 | 3,2 | 3 |

*Source: 1) Nacionalni program poljoprivrede Srbije 2010-2013., Republika Srbija, Ministarstvo poljoprivrede, šumarstva i vodoprivrede, maj 2010.; 2) http://www.uradni-list.si/files/RS_-2009-099-04371-OB~P002-0000.PDF;3) http://europa.eu/pol/financ/index_en.htm; 4) http://www.mfin.hr/hr/proracun*

In Slovenia, 2009 saw an increase in budgetary allocations for agriculture. This figure indicates that Croatia is in worse situation than Serbia except 2009 and 2010. In 2009, the European Union made a slight reduction in the agricultural budget, but the predictions state that this level of appropriations will continue in the current and in the next year. However, in comparison with neighboring countries, the nominal allocation for agriculture in Serbia is extremely small, as can be seen in Figure 1. In 2009, Serbia

2 According to the „National programme of agriculture in Serbia 2010-2013.", Republic of Serbia, Department of Agriculture, Forestry and Water Management, May 2010.

allocated around 164 million euros for agriculture, while Croatia allocated around 635 million euros and Slovenia around 487 million euros for agriculture.

**Exports of agricultural and food products** is still of great importance for export policies of the country as it participated with 23.2% in the country's total exports in 2009, and with as much as 31.3% in 2008, according to the Table 1. Agriculture is the only sector of the economy which recorded a surplus in balance of payments during the economic crisis. However, there has been no real improvement in the agricultural sector. Increased share of agriculture in total exports is contributed to bilateral agreements with countries in the region (CEFTA), duty-free trade with Russia, as well as preferential quotas for exports to the EU.

*Table 1. Share of agriculture in total exports and imports*

| Year | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|
| **Share in total exports** | 20,3 | 19,4 | 18,9 | 31,3 | 23,2 |
| **Share in total imports** | 7,4 | 6,9 | 6,1 | 6,4 | 8,4 |

*Source: Nacrt strategije ruralnog razvoja 2010-2013., Republika Srbija, Ministarstvo poljoprivrede, šumarstva i vodoprivrede, august 2009., p.57.*

As for **wages in the agricultural sector**, nominal wage growth was reported during the crisis. However, there was a drastic reduction in real wages as a result of inflation impairment. From Table 2, it is evident that there has been a reduction in nominal wages in the agricultural sector in 2009 (calculated in euros). Therefore, in comparison with other years, 2008 were exceptionally good for agricultural incomes and 2009 is in line with trend.

*Table 2. Wages in the agricultural sector*

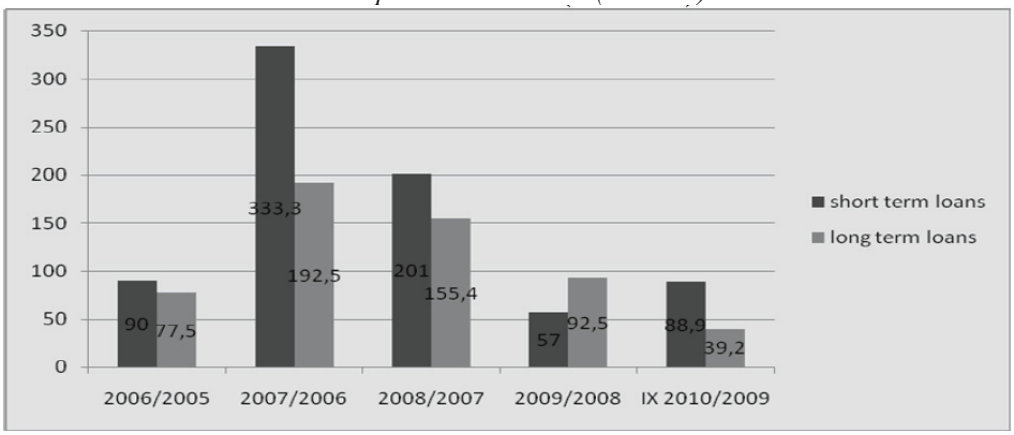
| Year | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Amount | Gross | Net | Gross | Net | Gross | Net | Gross | Net | Gross | Net |
| Serbia (in RSD)[1] | 20.301 | 13.835 | 25.951 | 17.683 | 29.680 | 21.244 | 37.204 | 26.696 | 38.421 | 27.582 |
| Serbia (in EUR) | 244,6 | 166,6 | 328,5 | 223,8 | 371 | 265,5 | 456,5 | 327,5 | 408 | 293,2 |
| Croatia (in EUR)[2] | 680,9 | 499,7 | 762,1 | 552,4 | 834 | 601,5 | 902 | 649,3 | 901,5 | 652,6 |
| Slovenia (in EUR)[3] | 947 | - | 963 | - | 1078 | 700,5 | 1196 | 778,7 | 1198 | 804 |

*http://webrzs.stat.gov.rs/axd/zarade.php?pok=2&Sifra=0014&izbor=tabela; 2) Source: 1) RZS, Prosečne zarade po sektorima delatnosti 2002-2009., Republika Hrvatska - Državni zavod za statistiku, Statističke informacije 2010, Prosječne mjesečne plaće po područjima NKD-a 2002., http://www.dzs.hr/; Hrvatska narodna banka, Statistika tečaja, http://www.hnb.hr/tecajn/htecajn.htm, 01.09.2010; 3) Statistical Office of the Republic of Slovenia, Average monthly gross and net earnings by activities (SDK 2008), http://www.stat.si/eng/tema_demografsko_trg.asp, 02.09.2010.*

Compared to Croatia and Slovenia, Serbia significantly lags behind in wages in agricultural sector. Wages in agricultural sector in Croatia are more than two times higher than in Serbia, and in Slovenia they are almost three times higher. Also, these countries recorded a trend of increased earnings in agriculture.

During the global economic crisis, there was a **reduction in lending activity** as a result of increased market risk. Conditions for obtaining loans have become less favorable due to the increase in interest rates. Banks are less interested in giving loans in order to avoid high risks. Therefore, the economic crisis affected the possibility of lending in two ways: by reducing the volume of loans, and by reducing the producers' opportunities for taking a loan. The reduction of lending activity in agriculture is the result of certain characteristics that are related to the sector. During the crisis there was a change in the strategies of banks, as well as insufficient funds for lending, which are approved by the Ministry of Agriculture, Forestry and Water Management of Republic of Serbia.

*Figure 2. Agricultural loans in Komercijalna Banka a. d. Belgrade for the period 2006-2009 (in index)*




*Source: Credit Bureau*

The data analyzed for „Komercijalna Banka a.d. Beograd“ (region of southeastern Serbia) on the Figure 2, recorded that in 2005 and 2006 credit structure for agriculture only included loans from the Ministry of Agriculture, Forestry and Water Management.

In 2007, credit structure included loans from the Ministry of Agriculture, Forestry and Water Management, and loans from "Komercijalna Banka a.d." assets, while in the 2008, 2009 and 2010 there were no funds from the Ministry, so approved loans for agriculture came only from the Bank’s own assets.

*Table 3. The placement risk of agricultural loans in Komercijalna Banka a. d. Belgrade (in %)*

| Year | 2007 | 2008 | 2009 | IX 2010 |
|---|---|---|---|---|
| Long term loans | 2 | 7 | 14 | 18 |
| Short term loans | - | - | 19 | 2 |

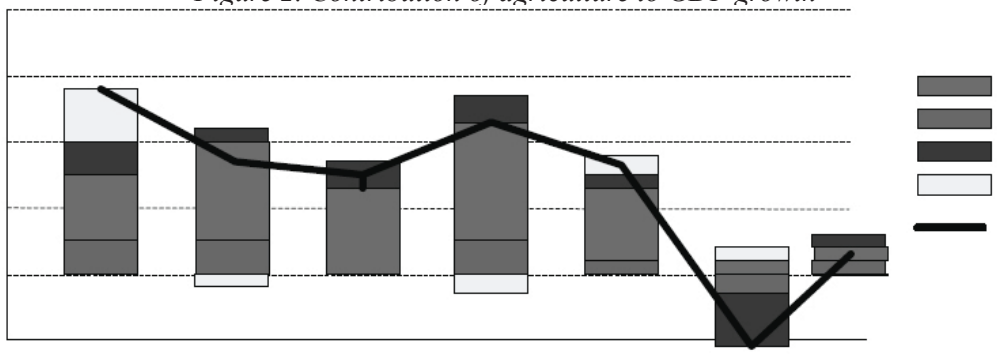
*Source: Credit Bureau*

Since there was a significant reduction of placement risk of agricultural loans in 2010 (up to September) in terms of short-term loans, that fact was immediately reflected on the increase in the number of approved loans. In the long-term lending, the rate of risk continues to grow, as can be seen in Table 3.

## Prospects of Agriculture in Serbia in Terms of Crisis

There is a perception that agriculture played an important role in terms of crisis, but that the driving forces of the future Serbian development are likely to be in the service sector, construction and industry, all of which should constitute a major part of GDP. As indicated in the National strategy of sustainable development, emphasis will be placed on the economy based on knowledge.

*Figure 2. Contribution of agriculture to GDP growth*



*Source: Jelašić R., National Bank of Serbia, Belgrade, 16. Jun 2010.*

Low level of participation of agriculture in GDP is the development indicator of a specific country. Of course, this does not mean that agriculture will not continue to grow, and that it will not be an important factor in the export policy of the country, and in general, an important sector that employs many people and forms the basis of stability in times of crisis.

One of the recommendations to mitigate the crisis and also the first measure of state intervention is to stimulate lending activity in order to secure the purchase, farmers' investments, funding for production and commerce, and to improve competitiveness. It is therefore very important for the state to support farmers who are willing to borrow

in times of crisis or who are willing to invest their own funds in the sector. It is known that investment activity is small in times of crisis.

Agriculture of Serbia has a **low competitiveness** compared with other countries, primarily due to low investments. It is therefore necessary to undertake a series of measures in order to improve: efficiency of production, product quality, marketing of agricultural and food products, the situation in the capital and land markets, the level of education and professional training and so on. Therefore, the Ministry of Agriculture should take adequate measures that will lead to sustainable agriculture that is internationally competitive.

In the draft of Rural Development Strategy of Serbia from 2010 to 2013, a vision for the agricultural sector is given, and it includes the development of dynamic and competitive agriculture that produces quality products, provides income to agricultural households and meets the customers' needs, but it also works together with the food processing industry, makes sustainable use of natural resources, and contributes to environmental protection. The basic strategic objectives are: to improve competitiveness, to ensure environmental protection, to promote local initiatives to improve competitiveness, to improve quality of life and stimulate the expansion of economic activities in rural areas. To achieve these objectives, the Strategy of Rural Development provided the following activities: establishment and improvement of the organization of agricultural producers; support for the farms so they can meet market challenges, support for the enterprises that are processing agricultural products so that they can improve their processing systems and reach the required standards of food quality and food safety.[3]

Also, **Serbia's accession to the European Union** will lead to raised agriculture competitiveness by establishing and improving the functioning of institutions and by the introduction of a series of regulations and standards. Other measures to be taken in order to increase competitiveness are: development of a credit line in cooperation with local authorities with the creation of local funds for agricultural development, agricultural support projects through investment and credit support, increased level of subsidies, support for the introduction of standards, promotion of Serbian agriculture on the international trade shows, promoting the work of advisory services, supporting the association of agricultural producers in cooperatives and other forms of association (clusters, local action groups, NGOs).[4]

Special features are provided by IPARD (Instrument for Preaccession Assistance – Rural Development) fund, which is a fifth component of IPA (Instrument for Preaccession Assistance), but not all requirements are met for obtaining them. Administration for agricultural payments was established, and it is one of the key institutions for access to EU funds and the provision of subsidies to agricultural

3 The draft Rural Development Strategy 2010-2013., Republic Serbia, Ministry of Agriculture, Forestry and Water Management, August 2009., Pp. 146.

4 According to the Nationnal programme of agriculture in Serbia from 2010-2013, Republic Serbia., Ministry of Agriculture, Forestry and Water Management, May 2010

producers. A network of advisory services was also established, and a large number of laws were passed in the field of agriculture (in 2009, 15 laws were passed, and a dozen more in early 2010).

One of the priorities is to prepare agriculture for the integration of Serbia into the EU. Economic objectives of the Copenhagen agreement, which defines the criteria for entry into the community of EU countries, include:

- Functioning market economy and the ability to integrate into market economies of other member countries.
- The ability of conducting business in terms of competition.
- Adjustment to EU rules and practices.

There is an ongoing implementation of the Stabilization and Association Agreement with EU, which implies the formation of a free trade zone between the EU and the candidate, and the process of harmonizing the legal framework of the country with the EU acquis. In the field of agriculture, the main activities the ministry will work on in the period prior to the full EU membership are: *harmonization of legislation, the establishment of new institutions, personnel reorganization and ongoing training of employees*.

**Accession to the WTO** is also a priority. This means that it is necessary to adjust agricultural domestic support policies and trade rules to WTO rules. Along with the process of joining the EU, Serbia is negotiating for membership in the WTO. After receiving the status of full member of WTO, Serbia can expect increased inflow of foreign direct investment, liberalization of access to the domestic market of agricultural and food products, and reduced protectionist measures that restrict the agricultural budget funds from being allocated to measures that are not in accordance with the policy of the WTO (price subsidies, export subsidies, etc.).

## Conclusion

World economic crisis, which culminated in late 2008, affected both financial and real sectors. The most important consequences of the crisis in the real sector are reflected in: reduced volume of loans, reduced inputs, lower yields, less competition, increased prices, reduced consumption, less profit etc. The role of agriculture in overcoming the consequences of the crisis is reflected in the increasing production and providing significant export revenues for the country. An important recommendation for overcoming the consequences of economic crisis and the improvement in the agricultural sector is to increase its competitiveness. To improve the competitiveness of domestic agriculture is crucial to the implementation of indirect measures of agricultural policy that reflects the investment in improvements of technological level of agricultural households, encouraging quality improvement of products, setting standards for food quality and safety. Also, it is necessary to intensify agricultural production through rational use of land fund and planning of infrastructure in rural areas.

In order to overcome the crisis it is necessary to take adequate and timely measures at state level, and on the level of economic sectors and businesses. In the

field of agriculture, a number of recommendations were given for overcoming the crisis, including: improving information and transparency of economic policy, giving the importance to agriculture in conditions of crisis that will lead to growth of GDP, providing budget support, increasing the level of competition and investment in agriculture, boosting credit activities, joining the European Union and the World Trade Organization, raising the living standard and the development of rural areas, raising the level of food safety, environmental protection and so on. So far, a few steps were taken towards the improvement of Serbian agriculture - Administration for agricultural payments was established, a network of advisory services was organized, and a number of laws were passed in the field of agriculture.

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Economics of agriculture
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UDK: 633.34:631.82

# RATIONALIZATION IN THE USE OF MINERAL FERTILIZER IN SOYBEAN PRODUCTION

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## Abstract

*The effect of different dosages of nitrogen fertilizers applied to the previous crop and seed inoculation with microbial fertilizer NS-Nitragin on soybean yield and consumption of mineral nitrogen from the soil was studied. The experiment was set up in the field of the Institute of Field and Vegetable Crops in four replications. Inoculation of seeds prior to sowing led to statistically highly significant yield increase in all four years of research, while the highest dosages of nitrogen contributed to a significant increase in consumption of mineral nitrogen from the soil and reduction in nitrogen fixation.*
***Key words****: nitrogen fertilizer, nitrogen fixation, inoculation, mineral nitrogen, yield, soybean*

## Introduction

Intensive crop production requires significant quantities of mineral fertilizers. Nitrogen is the main biogenic element and the most limiting factor in achieving high yields. Plant accessible nitrogen, the mineral form of nitrogen is subject to leaching losses due to its mobility in soil and denitrification, as well as increasing the content due to mineralization of organic matter in soil, resulting in specific nitrogen application for sustainable soybean production *(Malešević et al., 2005)*.

Soybean can reasonably be called a plant of the twentieth century, as it had previously been known and grown only in China *(Hrustić et al., 2006)*. The economic importance of soybean results from its chemical composition of grain, which contains approx. 40% of protein, all of the essential amino acids and approx. 20 -25% of oil with

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desirable fatty acid composition, and an abundance of minerals and vitamins *(Baranova and Lukomca, 2005)*. Soybean today has become one of the most important industrial plant from which more than 20,000 different products are obtained *(Davidenko, et al., 2004)*.

Soybean has a great importance for soil management, as it is enriching soil with nitrogen and maintains the soil in good physical condition, which makes it very desirable component in crop rotation. It is well known that the soil must have good physical properties, such as structure of aggregates and capillarity for achieving high yields *(Krmpotić et al., 2003)*. Plowed crop residues, such as soybean root and nodules, enrich the soil with organic matter, which have positive effects on its biological value and fertility.

The amount of mineral nitrogen in the soil is highly variable and depends on many factors: soil type, fertility, structure, biological value of the soil, crop residues, plowing, the input of organic matter, fertilization, nutrient losses by crop and previous crop removal, land utilization, processing system, climatic conditions and soil moisture and temperatures during vegetation and winter period *(Starcevic et al., 2003)*.

Nitrogen fertilization of soybean is very specific due to it's ability of biological nitrogen fixation and good use of residual nitrogen from the soil. *Bradyrhizobium japonicum*, *Bradyrhizobium elkani,* and *Sinorhizobium fredi (Martinez Romero and Caballero-Mellado, 1996)* are capable of forming symbiotic association with soybean plants. During symbiosis with plants, rhizobia live in specialized root nodules known to be able to fix some 180 kg N $ha^{-1}$ per year. These bacteria produce growth promoting substances, such as gibberellins and indole, which stimulate the growth of host plants. Soils usually have inadequate number of bacteria from the genus *Bradyrhizobium*, so when soybean is sown it is recommended to inoculate the seed with microbiological fertilizers based on these bacteria. Process of biological nitrogen fixation provides the soybean plants with 50-70% of the total nitrogen needed for obtaining high yield *(Krmpotić et al., 2003)*. Soybean responds to the increased content of available nitrogen in the soil by diminishing biological nitrogen fixation and yield reducing. Proper selection of appropriate doses of nitrogen depends on soil type, existing nitrogen present in the soil, weather and many other factors that directly or indirectly affect the yield *(Djukic et al., 2010)*. To exhibit the full effect of nitrogen fertilizer, it is necessary that all cultivation practices are carried out in a timely and quality manner *(Crnobarac et al., 2000)*, under optimal environmental conditions.

The main idea of this study was to examine how the soybean responds to different doses of nitrogen fertilizer applied under the previous crop (maize), in combination with inoculation of seeds and plowed crop residues in order to achieve high and stable yields, with the rationalization use of mineral nitrogen fertilizers.

## Material and methods

To study the effect of fertilization with different doses of nitrogen applied under the previous crop and the impact of the application of microbiological fertilizer Nitragin on soybean yield and consumption of mineral soil nitrogen, a four-year field trial was conducted on experimental plots of the Institute of Field and Vegetable Crops. The experiment was designed as three crop rotation cycles (corn - soybean - wheat), with four replications, and samples were arranged in a randomized block design. The treatments were: 0 kg ha-1 nitrogen with crop residues not incorporated into the soil, 0 kg ha-1 nitrogen (control), 50 kg ha-1 nitrogen and 150 kg $ha^{-1}$ nitrogen, 250 kg $ha^{-1}$ nitrogen with incorporated crop residues. The second treatment related to the inoculation and the absence of inoculation of soybean seeds with Nitragin - the microbiological fertilizer.

Nitrogen fertilization of the previous crop was applied, except in control. Immediately after wheat harvest and prior to stubble peeling, 50 kg $ha^{-1}$ N (KAN 27%) was applied to prevent nitrogen depression. The same amount of phosphorus and potassium fertilizers (80 kg per ha $P_2O_5$ and $K_2O$) were applied for all treatments. Phosphate (18%) and potassium fertilizers (40%) and half of the total amount of nitrogen (KAN 27%) were incorporated into the soil prior to primary tillage for corn, and the remaining amount of nitrogen (KAN 27%) was applied just prior to corn planting. depending on the scenario. No mineral fertilizer was applied to soybean.

Cultivar Proteinka (0 maturity group) and microbiological fertilizer Nitragin, developed at the Institute of Field and Vegetable Crops in Novi Sad were selected for this research. This microbial inoculant is characterized by a large number of highly potent strains of rhizobia (*Bradyrhizobium japonicum)*.

Dimensions of the basic plot were 5 m x 3 m, covering an area of $15m^2$. The experiments were protected with four soybean rows of the same cultivar, as a safety zone around the experiment. Plant density was 50 x 3.5 cm (571,430 plants per ha). One of each boundary rows of the plot was regarded as isolation, and as such discarded, and four central rows were taken for analysis.

During the four years of experiment the standard cultural practices for soybean production were applied: autumn plowing at a 25 cm depth, seedbed preparation and cultivation. Sowing was done using seeder machine and harvesting of the four central rows was done using micro plots harvester. All yield data were calculated on 14% moisture basis.

At the time of soybean planting and soybean maturity stage, the soil samples were taken to a depth of 90 cm (at interval layers of 30 cm) to determine the content of mineral nitrogen. The consumption of mineral nitrogen from the soil was calculated on the basis of differences found between mineral nitrogen in spring and autumn, corrected for yield and average nitrogen mineralization for this type of soil.

The results were analyzed statistically with the analysis of variance (ANOVA-2) program of MSTAT-C and the least significant difference (LSD) test.

## Results and discussion

Weather conditions prevailing during the growing season of soybean in the investigated period are shown in Table 1.

*Table 1. Weather conditions during the years of research*

| Month | Average monthly temperature (°C) | | | | **average** | Rainfall (mm) | | | | **average** |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2005 | 2006 | 2007 | 2008 | **1964-2004** | 2005 | 2006 | 2007 | 2008 | **1964-2004** |
| IV | 11,8 | 12,7 | 13,4 | 13,0 | **11,4** | 33,0 | 66,0 | 0,0 | 21,9 | **48,8** |
| V | 17,0 | 16,5 | 18,5 | 18,4 | **16,8** | 38,1 | 70,1 | 98,6 | 46,2 | **59,5** |
| VI | 19,3 | 19,7 | 22,1 | 21,8 | **19,9** | 135,4 | 104,3 | 71,1 | 115,9 | **85,9** |
| VII | 21,4 | 23,6 | 23,3 | 21,7 | **21,4** | 122,5 | 30,9 | 38,8 | 41,6 | **68,2** |
| VIII | 19,4 | 19,6 | 22,7 | 22,2 | **21,0** | 133,9 | 124,9 | 79,6 | 14,0 | **56,9** |
| IX | 17,3 | 17,9 | 14,6 | 15,2 | **16,8** | 67,0 | 23,8 | 78,8 | 93,6 | **45,1** |
| | 17,7 | 18,3 | 19,1 | 18,7 | **17,9** | 529,9 | 420,0 | 366,9 | 333,2 | **364,4** |

The most precipitations occurred in year 2005, when the highest soybean yield was achieved. The lowest yield was achieved in year 2006, with extremely high July temperatures and lack of rainfall, which led to the pod and flower abortion. During 2007 and 2008 growing season, temperatures were higher than the average while the rainfall was at the multi-year average level, but with an irregular schedule. In 2007 there was no precipitation in April, while the mean daily temperatures were higher by two degrees, compared to the multi-year average temperature, which had a negative effect on soybean emergence and impact on yield losses.

Annual variation of soybean yield was statistically highly significant (Table 2), which can be explained by different environmental conditions. The highest yield was achieved in 2005 (3805.6 kg $ha^{-1}$), which had the highest rainfall, as compared to other years of study. These results were consistent with the results of *Dozet (2009)*.

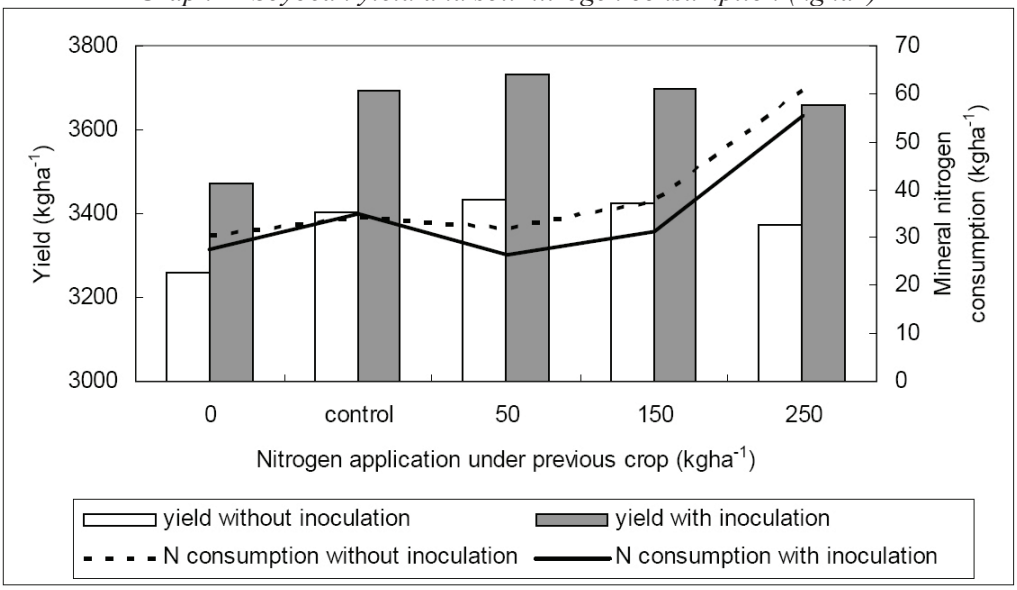
*Table 2. Effect of nitrogen fertilization and seed inoculation on soybean yield (kgha$^{-1}$)*

| Year (A) | Fertilizer (kgha-1) (B) | Seed inoculation (C) | | Average AB | Average A |
|---|---|---|---|---|---|
| | | Without inoculation | With inoculation | | |
| 2005 | control | 3663,3 | 3721,5 | **3692,4** | **3805,6** |
| | 0N | 3662,5 | 4008,8 | **3835,7** | |
| | 50N | 3725,3 | 3921,5 | **3823,4** | |
| | 150N | 3630,5 | 4061,3 | **3845,9** | |
| | 250N | 3679,0 | 3982,3 | **3830,7** | |
| | **Average AC** | **3674,3** | **3993,5** | | |
| 2006 | control | 2819,8 | 3137,5 | **2978,7** | **3088,3** |
| | 0N | 3057,3 | 3408,8 | **3233,1** | |
| | 50N | 2788,3 | 3292,3 | **3040,3** | |
| | 150N | 3023,5 | 3080,5 | **3052,0** | |
| | 250N | 3023,8 | 3250,8 | **3137,3** | |
| | **Average AC** | **2973,2** | **3258,1** | | |
| 2007 | control | 3243,8 | 3358,0 | **3300,9** | **3442,6** |
| | 0N | 3188,8 | 3354,8 | **3271,8** | |
| | 50N | 3373,8 | 3406,8 | **3390,3** | |
| | 150N | 3578,0 | 3691,3 | **3634,7** | |
| | 250N | 3557,5 | 3673,3 | **3615,4** | |
| | **Average AC** | **3424,5** | **3531,6** | | |
| 2008 | control | 3303,5 | 3676,7 | **3490,1** | **3723,8** |
| | 0N | 3711,7 | 3995,3 | **3853,5** | |
| | 50N | 3847,5 | 4308,3 | **4077,9** | |
| | 150N | 3471,5 | 3956,3 | **3713,9** | |
| | 250N | 3232,0 | 3735,5 | **3483,8** | |
| | **Average AC** | **3565,7** | **3998,9** | **Average B** | |
| **Average BC** | control | **3257,6** | **3473,4** | **3365,5** | |
| | **0N** | **3405,1** | **3691,9** | **3548,5** | |
| | **50N** | **3433,7** | **3732,2** | **3583,0** | |
| | **150N** | **3425,9** | **3697,4** | **3561,6** | |
| | **250N** | **3373,1** | **3660,5** | **3516,8** | |
| | **Average C** | **3379,1** | **3651,1** | | |
| **Average 2005-2008** | | | | **3552,5** | |

| LSD | Treatments | | | | | | |
|---|---|---|---|---|---|---|---|
| | A | B | C | AxB | AxC | BxC | AxBxC |
| 1% | 254 | 397 | 142 | 585 | 186 | 352 | 525 |
| 5% | 198 | 196 | 94 | 441 | 153 | 284 | 396 |

Observation of different rates of nitrogen variations (Figure 1) showed that application of 50 and 150 kg ha$^{-1}$ nitrogen (3583.0 and 3561.6 kg ha$^{-1}$) led to significantly higher yield in comparison to control (3365.5 kg ha$^{-1}$).

*Graph1 - Soybean yield and soil nitrogen consumption (kgha$^{-1}$)*




In treatments with no nitrogen and in those with nitrogen applied in the previous crop, inoculation of seeds with microbiological fertilizer (Nitragin) applied prior to planting had contributed to the increase in yield (3651.1 compared to 3379.1 kg ha$^{-1}$). In all four years, this increase in yield caused by applying Nitragin was statistically significant. These results were consistent with the results obtained by *Milic et al. 2003*, *Pušić et al. 2008, Djukic et al. 2008*. Consumption of mineral nitrogen from the soil when 250 kg ha$^{-1}$ of nitrogen was applied to the previous crop was the largest, and the yield was at the level of treatment with no fertilization and the plowed crop residues (Figure 1). Treatments with application of Nitragin inoculants showed lower consumption of mineral nitrogen from the soil and higher yield, in contrast to the treatments with no Nitragin application. This indicates that soybean uses nitrogen from the atmosphere more than that from the soil, which significantly affects the yield increase. Microbial inoculants allow the replacement of mineral nitrogen fertilizer, which has economic and environmental effects, because the incorporation of microorganisms reducing the use of mineral nitrogen fertilizer, does not pollute the soil, improves soil structure, increasing organic matter content and positively affecting the physical properties of the soil *(Milic et al., 2004)*. In the treatment where 50 kg ha$^{-1}$ of nitrogen was applied, the highest yield was achieved in this four-year period, as in treatments with and without inoculation. By increasing the nitrogen rate applied to the previous crop, a yield reduction and a significant increase in consumption of mineral nitrogen from the soil and decrease in nitrogen fixation were noticed. If the soil containing 65 kg ha$^{-1}$ or more mineral nitrogen at the depth of 0-90 cm prior to soybean planting, additional nitrogen

fertilization to achieve high soybean yield should be avoided *(Dozet, 2009)*.

In developed countries, 25% of energy needed in agriculture is used for production of nitrogen fertilizers, which implicate the importance of soybean and biological nitrogen fixation (*Адамень і sar*., *2003*).

## Conclusion

Based on the four-year results regarding application of mineral nitrogen fertilizers to the previous crop in soybean production, the following conclusions can be drawn:

Plowing of crop residues contributed to increased crop yields in the treatments with and without application of microbial fertilizer Nitragin.

Inoculation of soybean seed prior to planting is a reasonable measure in crop cultivation, which contributed to increased soybean yield, regardless of the amount of nitrogen applied to the previous crop. Amounts of nitrogen applied to the previous crop in dosages ranging from 50 to 150 kg $ha^{-1}$ resulted in yield increase, while the amount of 250 kg $ha^{-1}$ reduced the yield.

Use of large quantities of nitrogen fertilizers has increased the consumption of mineral nitrogen from the soil, without increasing the yield of soybean.

It is possible to achieve significant savings in the production of soybeans by inoculation of soybean seed, plowing of crop residues and taking advantage of residual nitrogen which remains in the soil after cropping.

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Economics of agriculture
SI – 2
UDK: 641.1:613.97

# CURRENT ISSUES AND CHALLENGES ON FUNCTIONAL FOOD

*Corina Ene*[1]

## Abstract

*The article sets out the key-details in the field of functional foods, featuring their current role and relevance, which are based on their functions and associated benefits. It also lays down a wide range of issues and key-challenges - related to both consumers and producers - whose approach will determine the future trend line for this sector of food production. The paper shows a series of important elements to be taken into account by governments, experts, sellers and consumers so that the integration of functional food in human nutrition has a positive effect on health and nutritional welfare.*

***Key words:*** *functional food, benefits and concerns, legislation, consumer protection*

## Introduction

At present, food market witnesses an intense diversification attributed to complying with growing consumer preferences and demands. In recent decades there has been a worldwide explosion of the assortment of food consumer goods that led to a reassessment of traditional foods with nutritional increasingly higher performance. This has led to profound changes in the conceptual range and quality criteria in the areas of food production and food technology, as it incorporates an increasing volume of scientific and technical progress. As a result, consumers are more and more confronted with a series of *terms*, not enough explained, such as: light food, fast food, novel food, convenience food, dietary food, ethno food, ecological food, alternative food, functional food, nutritional supplements etc.

Currently, food that help maintain long-term health is recognized in a new manner, which represents a new dimension to the appreciation of the positive influence that food can have on human welfare, beyond purely nutritional aspects.

This initially led to the increasing popularity of healthy food and holistic medicine,

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so, since the late '90s, we are witnessing a consolidation of this sector on the extent of relevant scientific evidence propagation (Sheehy, 1998).

In particular, consumer interest has substantially increased linked to the role of specific foods or physiologically-active components, with positive impact on health - the so-called "functional foods". Obviously, all foods are functional to some extent, because they provide taste, aroma and nutritional value (Hasler, 1998). However, in the last decade, these terms applied in the food sector acquired a different connotation - that of providing an additional physiological benefit - beyond the basic nutritional needs.

In this dynamic context, the production of functional foods is a challenge for technologists, nutritionists, biochemists, microbiologists.

From an economic perspective, functional food market is significantly dynamic worldwide, showing a higher rate than the average growth of the sector (e.g. in the U.S., annual sales amount to 20-30 billion $, equivalent to 5% of the food market) (PWC, 2009).

## Functional Foods - Concept, Meanings, Functions, Benefits

Many organizations and interested parties have proposed *definitions* for this emerging area of the food and nutrition sciences, but a common point of view could not be created due to differences of opinions.

As there is no consensus on what constitutes a *functional food*, in many parts of world (Chan, 2010), functional foods are simply referred to as foods associated with health claims. The most significant characteristic for functional food remains its potential to alleviate disease, promote health, and reduce health care costs.

The term functional food (or more correctly, "*physiologically functional foods*") (Sheehy, 1998) was first introduced in Japan in the mid 1980s (Hasler, 1998), being used by industry to describe foods fortified with specific ingredients that generate certain health benefits. So far, Japan is the only country that has formulated a specific regulatory approval process for functional foods.

In 1994, Goldberg has expressed more clearly the concept of "functional food", defined as, „*any food or food ingredient that has a positive impact on an individual's health, physical performance or state of mind, in addition to its nutritive value*" (Sheehy, 1998).

This concept aimed at *two categories*: functional foods for disease prevention and therapeutic foods. Thus, in principle, a food may be considered functional if it contains compounds that are biologically active and it is sufficiently demonstrated having one or more benefits for the body, in addition to adequate nutritional effects.

The Japanese Ministry of Health and Welfare have established *three conditions* that functional foods must satisfy (Sheehy, 1998):

- they should be foods, not capsules, tablets or powders, which are derived from naturally-occurring ingredients;
- they can and should be consumed as part of the daily diet;
- they have a particular function when ingested, serving to regulate a particular body

process, such as enhancement of the biological defense mechanisms, prevention of a specific disease (e.g. heart and artery disease, cancer, hypertension, or obesity), control of physical and mental conditions, or slowing down the ageing process.

Some authors (Hughes, 2007) consider that there are *three distinct categories* of functional foods, as follows:

- *natural* - foods that naturally contain beneficial compounds for sustaining health and disease prevention, outside the basic nutritional function (e.g. blueberries, broccoli, prunes, salmon);
- *manipulated* - resulting from the adaptation of food production systems that convert standard food to functional foods (e.g. manipulating animal feed: feeding chickens with special formula allows to obtain eggs rich in Omega-3 fatty acids; tomato genetic modification to achieve a high level lycopene reduces the risk of cardiovascular disease and cancer);
- *processed* - a set of "artificial" functional foods, whose characteristics are modified and adapted during processing technology, which may involve adding or / and extracting compounds and micro-organisms (e.g. yogurt that contains beneficial bacteria to improve function such as digestion and circulation).

Other authors (Poulsen, 1999) considers that "functional foods" is a relatively new term used to describe food products which have been enriched with natural substances / physiologically active components with a specific preventive and/or health-promoting effect.

The Institute of Medicine's Food and Nutrition Board (IOM/FNB, 1994) defined functional foods as "*any food or food ingredient that may provide a health benefit beyond the traditional nutrients it contains*" (Hasler, 1998).

Overall, scientific research in the field showed that the *main functions* of functional food are: defending the body's health by reducing allergies; immune system activation; avoidance of disease by preventing high blood pressure, diabetes, congenital metabolic imbalances and the growth of tumors; the control of functions of the body, the nervous system functioning, appetite and nutrient absorption; reducing the duration of convalescence and the effects of aging. In addition, functional foods have the ability to better manage risk factors such as deficiencies in minerals and vitamins, blood cholesterol or various forms of digestive discomfort.

In this context, we believe we cannot develop a single definition for functional foods, because they are classified separately on categories, but their generic feature, regardless of their mode of obtaining, allows us to call as "functional" foods that have beneficial effects (scientifically proven) on the human body functions beyond the nutritional effects, promoting good health, nutritional wealth and/or reducing the risk of illness.

Functional foods group includes *examples* such as (Table 1):

*Table 1. Effects and benefits of some popular functional foods*

| Examples of functional foods | Effects and benefits of functional foods |
|---|---|
| Dairy prebiotics/ probiotis | probiotic bacteria interact with intestinal flora, improving its quality, intestinal mucosa or exerting a modulating effect on the intestinal immune system |
| Oatmeal | source of soluble fiber which helps reduce cholesterol and thus the risk of coronary heart disease |
| Soy | protein source of high quality role of risk reduction for cardiovascular disease, cancer, osteoporosis and alleviate menopausal symptoms. In addition, lower blood cholesterol |
| Flaxseed | contain a high amount (57%) of alpha linolenic acid (omega-category 3), helps to reduce total cholesterol and bad cholesterol |
| Tomatoes | Lycopene and carotenoid content makes them effective in reducing the risk of cancer (prostate, breast, gastrointestinal tract, cervix, bladder and skin) |
| Garlic | antibiotic properties, anti-hypertensive (prevents cardiovascular diseases) and reducing cholesterol levels, effective in reducing the risk of gastric cancer and colon |
| Cruciferous vegetables | cancer risk reduction |
| Citrus | cancer risk reduction, the main important nutrients: vitamin C, folate and fiber |
| Cranberry (juice) | efficacious in the treatment of urinary tract infections |
| Tea | antioxidant polyphenolic constituents of tea have the effect of cancer prevention |
| Wine and grapes | maintaining good blood circulation, protects cells against the action of harmful free radicals |
| Fish, beef | good source of omega-3 fatty acids, cholesterol and decrease cardiovascular risk reduction and risk of cancer |

*Source: adaptation from (Hassler, 1998)*

Currently, there are numerous *international initiatives* regarding the promotion and enhancing the role of functional foods for human consumption.

While developments in Japan are often cited as indicative of possible developments in other parts of the world (as the government instituted an approval system for functional foods in 1991), until now, functional foods in the US are not legally defined as a distinct category, which has generated a confusing regulatory framework, while Food and Drug Administration (FDA) is still reviewing functional food regulatory requirements.

Lagging US and Japan in terms of establishing a set of regulations in the field of functional food, the European Union (EU) set up a European Commission Concerted Action on Functional Food Science in Europe (FUFOSE), mainly due to increasing interest in the concept of "Functional Foods" and "Health Claims". For the implementation of FUFOSE's conclusions and principles a new EU Commission Concerted Action programme, the Process for the Assessment of Scientific Support for Claims on Foods (PASSCLAIM) project was created, aiming to resolve some of the

ongoing issues of validation, scientific substantiation of claims and communication to the consumer.

Though, given the proven benefits of these foods, at european level there is an intense support of this area. Thus, the EU supports (through its framework programs) R & D on functional foods in many *ways*: food companies can participate in integrated projects (IPs), Networks of Excellence (NoE), specific support actions (SSAS) (eg: FFNet SSA) and research projects on specific topics (STREPs). In addition, there are two specific schemes for SMEs, for example, Co-operative Research (CRAFT) and Collective Research.

## Controversies and Challenges concerning Functional Foods

There is a large controversy about functional food worldwide, especially for those obtained by artificial means, which contain added ingredients, or whose concentration is conducted.

Although increasing the availability of healthy foods, including functional food is a ubiquitous goal in the modern food and nutrition policies, *safety* remains essential, because the optimum level of the majority of biologically active components is still in the process of investigation, not being established yet. In addition, some research has highlighted the toxic and carcinogenic potential nature of certain phytochemical components beyond certain limits of concentration - this being more relevant in the context of increasing consumer's interest in nutritional supplements.

Despite the increasingly advertised benefits, there are still some *potential barriers* to widespread acceptance of functional foods, both from the perspective of consumers, and producers, as follows:

- Development of functional food and basic research for documenting marketing claims are expensive, so there can be a need to set default high prices for this foodstuff, contrary to the interest of buyers.
- Buying functional food could become the privilege of some groups of consumers with high purchasing power, with a high level of awareness about food intake (Sheehy, 1998). Thus, for functional foods not becoming an elitist group of foods (especially as, on the international level, increasing attention is given to disadvantaged consumers in terms of socio-economic status), price policies should ensure large groups of consumers' access to those foods, given their beneficial health role (by default, raising awareness and educating consumers are becoming extremely important).
- Some consumers may suspect that the promises about health benefits will be used only as a marketing ploy to justify higher pricing, or to obtain a competitive advantage. Therefore, an essential requirement is that marketed benefits should be real and correct, legally and ethically.
- There are concerns that the promotion of functional foods and marketing claims may not rely on sufficiently strong scientific evidence (Hassler, 1998); also, confusion persist between claims applied to foods and those applied to dietary supplements;
- Consumers can also raise the question if functional foods are still necessary if they

have already adopted a healthy diet style, and whether they can induce a false sense of security being used to compensate for unhealthy eating habits.

- Consumers tend to be circumspect about the information on healthy eating, using a variety of sources. Besides mass-media and label claims, messages from health professionals have a higher credibility, but there is a need that messages are more clear and specific, with quantitative information, clearly explaining the effects of food on health, as far as scientific evidence becomes available. By contrast, there is low level of trust in food companies' marketing claims, but sometimes in government and its ability to create the appropriate frame for correct food consumption.
- Consumers may show skepticism towards some unusual functional foods, so that industry experts suggest that functional foods may become attractive especially to those consumers looking to avoid unnecessary expenditure for medical care, in which case the communication of health benefits becomes critical (PWC, 2009).
- Research of interactions between supplements and functional foods or ingredients is required.

Many authors (Heller, 2001) emphasize the need for transparence toward consumers, suggesting *recommendations* regarding the safety of functional foods:

- develop and promulgate regulations or other guidance for industry on the evidence needed to document the safety of new ingredients in functional foods;
- develop and promulgate regulations or other guidance for industry on the safety-related information required on labels of functional foods;
- develop an enhanced system to record and analyze reports of health problems associated with functional foods.

Since enriched foods are becoming prevailing in the market, scientific data must be used with caution and its meaning should not be extrapolated anywise in order to avoid situations such as abstention from groups of compounds under the pretext of contribution from other sources (which is insufficient or is using an unhealthy food as a support) (eg soft drinks rich in fiber), high vitamins consumption by categories of the population to which it is not recommended (eg foods high in vitamin A for pregnant women), excess nutrients can become toxic (eg iron, folic acid, vitamin D).

In this context, the consumer's benefits and risks should be carefully evaluated in the light of the widespread use of physiologically active food (eg soy phytoestrogens), so scientific studies must provide strong evidence to minimize the risk/benefit ratio.

Today's orientations in nutrition sciences move the focus from "deficient/adequate" approach to optimal nutrition (Sheehy, 1998), whose vectors are also functional foods. However, there is an obvious need for more extensive and deeper research, so that these benefits can be measured and justified properly.

Appealing to the balance demand, a report of FAO (FAO, 2007) suggests avoiding excess of functional foods consumption that could be detrimental over other food groups necessary in the daily diet.

FAO *recommendations* in the field of functional food promote the principles and the means of Codex Alimentarius, covering significant issues, and are summarized below:

1. The need for a specific definition of functional food can be addressed by adopting an internationally valid definition and by creating an international database of biologically active components (whether naturally present or added), which should be subject to international standards based on scientific and technological developments and data on safety, bioavailability, stability and other relevant data. Such a definition had previously been formulated by FAO in 2004, stressing that functional foods should be "*a food similar in appearance to a conventional food (beverage, food matrix), consumed as part of the usual diet which contains biologically active components with demonstrated physiological benefits and offers the potential of reducing the risk of chronic disease beyond basic nutritional functions*" (FAO, 2007).
2. Health claims and nutrition claims should be clearly defined and harmonized, referring distinctively to what the product contains (nutrition claims), or to what the food or food components does or do (health claims).
3. Health claims should rely on scientific validation and substantiation, addressing *issues* such as: using scientific protocols, defining guidelines for safety and efficacy assessment, establishing the optimal levels of nutrients, identifying unwanted effects etc.

Increasing global concerns in the field is materialized in International Life Sciences Institute's (ILSI) activity; ILSI is directly involved in organizing international conferences on the matter (1995, 2001, 2007), whose *contributions* include:

- Providing an international forum for information sharing and discussion;
- Building consensus on scientific basis for regulations, building the basis for regulatory framework in Asia, Europe (including the coordination of FUFOSE) and USA as well as at international level through Codex;
- Coordinating and organizing workshops and expert consultations;
- Encouraging industry development;
- Promoting scientific advances;
- Coordinating functional foods publications;
- Establishing task forces/working groups to address issues related to functional foods

Throughout its substantial activity ILSI revealed a number of *key issues* and *global challenges*, including: lack of definition of the food group; lack of scientific substantiation for claims of different levels; different stages for regulatory framework; difficulties concerning consumer understanding and effective communication.

In the same time, ILSI emphasizes the increasing consumers' interest in diet and health, a greater demand for specific foods that provide health benefits beyond normal nutrition, underlining the need for more research and development on functional foods and for better regulatory control.

Some authors (Kaplan, 2006) depict several key-concerns for marketing of functional foods that raise the most doubts, including the possibility of exaggeration their effects, the difficulties of determining the appropriate using, distribution, and regulation, and the fact that, at present, growing interest is fueled more by the food industry than by nutrition and medicine specialists, so there are reservations about possibly most benefiting sellers than consumers.

Several researches is currently focused towards understanding the impact of "functional foods" in order to identify how they could help prevent chronic diseases or enhance health, thereby reducing healthcare costs and improve quality of life for many consumers.

An emerging discipline that will have a profound effect on the future of functional foods is nutrigenomics, which investigates the interaction between diet and disease development based on an individual's genetic profile.

Another technology that will greatly influence the future of functional foods is biotechnology, which shows, according to scientists in the field, an enormous potential to improve the health of millions of consumers (eg through the creation of iron-enriched rice, golden rice, lycopene-enriched tomatoes) (Chan, 2010). But the limits of applicability and the potential of these solutions depend directly on consumer acceptance of biotechnology (currently still a major problem in Europe).

Given the information gap associated with functional foods, labeling - as in other situations - plays a decisive role in enabling consumers to make informed choices, provided a correct, clear and precise content.

Functional food success will depend, too, on understanding consumer behavior and choices.

## Conclusions

However we might classify functional foods, they are an essential part of a trend in food science and marketing that is gradually changing traditional conceptions of diet and medicine. Being at the boundary between food science and technology, politics, trade, and nutrition, this group of foods generates controversy and affects numerous interests, whose results may or may not promote a healthy diet, may or may not respect the rights of consumers.

Consumers turning to functional food due to their benefits needs to understand that this option does not automatically provide access to health, while being not a panacea, especially as a healthy life also involves other aspects: physical activity, limiting stress, giving up other harmful habits.

In this context, regulation of food with special benefits, in terms of consumption, intake, marketing etc. should cautiously consider all these issues, and should be based on scientific advice for a healthy diet, in terms of consumption in normal quantities, provided that manufacturers are able to provide evidence for the promoted benefits. A strict legal framework, although at first may seem limited and constraining will serve in the long term to protect both consumers and the responsible manufacturer.

The success of functional foods will depend on various factors, including safety, effectiveness, taste, convenience, value, the real nature of the benefits. Functional foods should be promoted as components of a healthy diet, rather than as a way to offset a poor diet. The essence of a proper diet lies in the need for balance, variety and moderation, in combination with physical activity. Only in this context, the future of functional foods will be able to contribute to improving the health and vitality of large parts of the world population.

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Economics of agriculture
SI – 2
UDK: 332.1+316.4.063.3 (470)

# INTEGRATION AND REGIONALIZATION OF THE MODERN ENTREPRENEURIAL ACTIVITY: CHALLENGES FOR RUSSIA AND EASTERN EUROPE

*Vasily Erokhin*[1]

## Abstract

*Integration in the world trading system fundamentally depends on whether policies and institutions are established in a country and its trading partners which are conducive to the mutually beneficial exchange of goods and services based on specialization and comparative advantage. Trade integration processes became more active after 1950s in all over the world. Today the separate country is not more able to control the competitive struggle between enterprises and countries, new spheres of competitiveness on the traditional markets. Effective integration of the economies in transition thus, involves not only their own trade policies and institutions but also those of their trading partners which affect market access and the terms of trade.*

***Key words:*** *Entrepreneurship, integration, regionalization, Russia, EU, CIS, Eastern Europe*

## Introduction

The place and role of any country in global market depend on many factors. Basic of them are level and dynamics of national economic development; openness degree of the national economy; character of its participation in the international economic relations and others.

The basis of the integration process develops at a microlevel as mutually advantageous cooperation of the concrete companies, banks, financial and industrial groups, their joint investment projects, creation of the transnational enterprises.

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## Methodology

Words "economic integration" was first used in 1930s in the papers by German and Swedish economists. The most known theory at that time was "the theory of large spaces" established by the German historian and economist K. Schmidt. He pointed on the increased weakness of the traditional national countries in the process of economic development in XX century and suggested the idea to create the large "geospaces" as the new, more perfect and large-scale subjects of international relations.

International economic and trade integration is the process of consolidation of different elements of national economic systems, the highest stage of the modern economic internationalization. This process is followed by the interstate development based on the special agreements and its own structure, represented by the different administrative bodies and over national independent organizations.

Nobel prize winner, Dutch economist Jan Tinbergen defined economic integration as the "creation of the most favourable structure of international economy, reduction of artificial barriers in its activity and implementation of necessary elements of coordination and unification". It highlights two main ideas. First, before the beginning of any integration processes it is necessary to clearly determine their goals and understand the structure of international economic and trade relations that is optimal for integrating countries. Second, any integration process consists of two kinds of measures: "negative", which assume the abolition of old and non-effective institutions, reduction of restrictions and barriers in trade or migration of production factors; and "positive", connected with creation of new unified rules and standards.

## Discussion

The historical and economic analysis shows, that Russia (USSR) went through five stages in its interaction with global economy:

1. Stage 1. 1917-1945. Political and economic isolation.
2. Stage 2. 1945-1985. Cooperation with other socialist countries ("socialist camp").
3. Stage 3. 1985-1991. Disappearance of socialism as political system.
4. Stage 4. 1991-2000. "Building the capitalism".
5. Stage 5. 2000 - present time. The economic pragmatism.

Europe was always one of the major priorities for Russian integration. It is caused by a great number of reasons: historical, political, and economic. Europe was always the main source of the foreign investments to Russia, Russia always used the newest science and engineering achievement from Europe. For this reason in the Russia external policy in1990s the role of European direction has essentially increased.

European Union today is one of the three main industrial, financial and trade centers of the world. It is especially important for the European part of Russia, where basic part of the population and manufacture are concentrated.

EU is the basic trade partner of Russia. Its share in Russian trade turnover is 35%. Up to 60% of all foreign investments come to Russia from the EU. Though the

share of Russia in the EU foreign trade is only 3,5%, Russia provides up to 20% of gas and 16% of oil to EU. Also Russia is the main importer of the European agricultural products.

The long-term development strategy of the EU-Russia relations includes the cooperation in such spheres, as:

- structural and industrial policy;
- conversion of military manufacture;
- environment protection;
- scientific potential;
- information technologies.

In 1997 was submitted the Agreement on Partnership and Cooperation (APC) between Russian Federation and European Union. This Agreement is directed on creation of the necessary conditions for gradual Russian participation in the European cooperation. The Agreement determines:

1) trade regime for goods and services;
2) the conditions of the business activity, capitals and labour migration;
3) the basic directions of the economic cooperation;
4) the general legal frameworks of cooperation in various industries, including raw and mining, energy supply, agriculture, construction, standardization and certification, the realization of the concrete industrial projects.

At the same time, this Agreement has the negative restrictive regime for Russian export on a number of important commodity groups (black metals, textiles, uranium fuel and agricultural production).

Because of the EU expansion and integration to the EU of East European and Baltic countries the Russian export to the traditional for our country markets can decrease (in particular, export of mineral fertilizers, chemical products, agriculture products). There is still the practice of antidumping procedures for Russian products.

Russian export to EU includes oil, gas, raw materials and other low-processed products.

The important stimulus for the development of the mutually advantageous cooperation between Russia and EU is the creation of the legal environment by the unification and rapprochement of the Russian and European legislations. The EU legislation of EU meets the international requirements, in particular, WTO rules. The rapprochement of the legislations will push the Russian businessmen to the necessity of the flexibility and fast adaptation to the conditions of the European market. Also it will speed up the structural reorganization of the Russian economy.

Alongside with the development of the trade relations Russia supports the close connections with the European financial markets, with banks and other credit organizations. There are Paris and London Credit Clubs, and Russia participates them, and also there is the European Bank for Reconstruction and Development. The West-European investors are active enough on the Russian market.

The relations with the CIS countries are the special problem for Russian integration processes. Last years the traditional trade relations with the CIS countries weakened because of the orientation of the Russian trade flows to the West Europe and USA.

In the beginning of the 1990s the share of the Eats European and CIS countries in Russian export was 60%, in import – 40%. In the middle of the 1990s their share decreased to 15,4% in export and 16% in import. The main reason of this decrease was the aspiration of Russian businessmen to export their production to the West Europe and USA and to get the hard currency. At that time the contract prices with CIS countries remained much below the global prices.

The markets of CIS countries are the traditional zone of influence for Russia and more favorable conditions for the competition with western producers. And also for the CIS countries Russia is a very attractive trade partner. It is determined by the significant economic potential of our country, cheaper mineral resources, the high level of industrial and trade integration, technological interdependence of the enterprises.

The integration process in the frameworks of CIS started in 1993 with the Agreement on creation of the Economic Union. This Agreement provides the legislative base for the gradual deepening of the integration process through a number of stages:

- creation of free trade association,
- customs union,
- common market of the goods, services, capitals and labour.

The Economic Union assumes:

- free moving of the production factors
- coordinated credit, budget, tax, price, external, customs and currency policy.
- the national legal regime to the businessmen of the participating countries,
- the assistance to their direct economic relations,
- the creation of the joint enterprises, transnational associations
- the coordinated investment policy, including the joint capital investments and attraction of the foreign investments and credits.

In 1995 was submitted the governmental program on deepening of economic integration with the CIS countries. This program determined the main directions of the economic interaction with CIS:

1) trade;
2) the currency and credit policy;
3) joint activity, including joint investment programs;
4) the activity of the interstate economic structures.

Nowadays there is the active process of the construction on the basis of CIS the economic and trade union of four countries: Russia, Belarus, Ukraine and Kazakhstan. It is supposed:

- to create the organization of regional integration on the basis of the free trade union,

- to unify the budget and tax policies, and also other branches of economic legislation.

The creation of this union will:

- facilitate the trade process between the participating countries,
- increase the competitiveness of the national producers on the common integrated market,
- allow to unify the foreign trade legislation
- form the economic basis for closer interaction of the participating countries on the EU example.

Another way of the development of integration process in the frameworks of CIS is the creation of the united state of Russia and Belarus. The free trade regime between these countries was established in 1992. On the basis of the Agreement on Customs Union there was created the customs regime which assumes both free trade regime and joint protection of national economies. The development program also includes the development of custom infrastructure. It is very important for Russia, because the western borders of Belarus will be the customs border of Russian Federation with EU. Unfortunately, in the last 2 years the Russia-Belarus integration process stopped because of the political and economic reasons.

East Europe is also very important region for Russia. These countries are the former members of the Council for Mutual Economic Assistance (CMEA) – Czech Republic, Bulgaria, Hungary, Poland, Romania, and Slovakia. The share of these countries in the Russian foreign trade decreased from 38,7% in 1990 to 15% in 2005.

This decrease of the foreign trade is followed by the deterioration of its commodity structure. The share of oil, wood, aluminium and chemical products increase. The significant part of import from these countries is agricultural products, though the share of machinery and equipment in import from Hungary, Slovakia, and Czech Republic is 40%.

Today the East European countries lost their role of the main Russian economic and trade partners. However the revival of the economic cooperation between Russia and the East European countries meets the interests of both sides. In future Russia can become the significant investor to the economy of the East European countries.

Also there is the interest from East European countries to invest in Russia. And of course Russia has a great capacious market and a grate potential for the development of trade relations with East Europe.

## Estimation results

Today the successful integration of our country to the global market depends on the several factors:

1) the results of the Government activity on improvement of the national economy, its structural reorganization and transition to the market conditions;

2) the creation of the effective legislative, organizational and technical preconditions for the economic development.

Russia can enter the integrated global trade system only on the basis of conditions which suit our country from the point of view of economic safety, do not interfere with carrying out of those structural transformations which will provide to it a worthy place in the world community.

Even at the insufficient degree of reduction process regulation of the custom duties the further trading negotiations under the Russian accession into WTO should concentrate on the decision of two basic problems: on liquidation of a tariff dispersion and restriction of tariff escalation. It is natural, that the agreement on priority decrease of high custom duties that will help to solve a problem of a divergence in tariffing levels various products should be accepted. It will limit the countries in an opportunity of an establishment of higher protective measures on the priority goods for itself.

For maintenance of really liberal and equal character of international trade it is still required the carrying out of many trading negotiations rounds. But all the same the significant part of work on creation of the free global market is already made. Further it is necessary only to improve the main principles of integrated global trade system and adopt them to constantly varying conditions of modern economy.

## Conclusions

In the 1990s Russia was in the extremely difficult situation. As a result of the radical economic reforms the country was rejected on some decades back, while the majority of other countries quickly advanced. If USSR occupied the 2nd place after USA on GDP, in 1998 Russia was on the 12th place, after, for example, China, India, Brazil and Mexico.

Today Russia is deeply involved in the global economy. The share of export in its GDP is about 27%, even more than in Germany, France and Italy. Russia already became the country with the open economy. But the Russian export consists of energy resources and raw material. Due to the orientation on the external market these branches (oil, gas and metals) remained competitive, while other branches, especially machinery production, decreased in 2-3 times.

The status of the high-developed country in the modern integrated world is impossible without the structural changes in the Russian business. The national economy should be based on the powerful integrated corporate structures, first of all financial and industrial structures, capable to compete on internal and global markets with the leading transnational corporations.

Within the framework of the complex integrate strategy of TNC the capital flows (direct investments) and trade come together. There are diverse connections in production sphere: between the headquarter company and its foreign branches, between different branches of the corporation, between various TNCs and their branches or any other companies. The international trade becomes the reflection, the consequence and the stimulus of these connections.

Such new scheme has a number of differences from the former scheme of international trade. According the former scheme, the production was focused within the national economy, and then the products went abroad to the external markets, where they competed with the products from other countries. Nowadays this situation changed; there is the competition of the TNCs on the global market.

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Economics of agriculture
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UDK: 637.1:636.32/.38

# STATISTICAL AND ACCOUNTING COSTS AND EFFECTIVENESS OF TRADITIONAL SHEEPFOLD'S PRODUCTS

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## Abstract

*The agricultural food products and practices used for the management of land, pastures, meadows, and orchards, but also the manner in which animals are bred and cared for, plays a crucial role both in the creation as well as in the perpetuation of the local culture, landscape, but especially in the adults' and children's health. The essential part of this paper seeks to define statistical and accounting costs and effectiveness of traditional sheep's products.*

*The annualization methodology were based on the following methodological criteria, resulted from the subjective reactions and estimations of the interviewed persons, due to which it was necessary to view and determine the level of their incomes with some caution, based on the information collected from the households, and also compared with the international fairs.*

**Key words:** *food, cost and effectiveness, traditional agricultural products.*

## Foreword

In the elaboration of this article, the authors were challenged by a number of threats to the development of the Romanian economy, especially to the rural, or to the traditional one, such as:

- the abandonment of sheep breeding, with negative effects on the local food products,
- the drastic decrease of the sheep breeding population and of the average number of members of a traditional household, which will never be able to provide alternatives to the development of the agriculture by promoting certain agro-tourism activities in the affected areas,
- the excessive ageing of the rural population,
- the lack of a corresponding replacement rate among the young population, as compared

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to the elderly one, able to guarantee the survival of the main rural occupations and activities,
- the imminent disappearance of certain traditional local food products, and the resulting loss of culinary originality within certain programmes, projects, or agro-tourism services,
- the change of the original purpose of the agricultural lands, by desertification processes, systematic neutralization, and urbanization, etc.

The rural Romania still manufactures the traditional products that are so much appreciated both by Romanians, as well as by foreigners. Consequently, these traditional products should be protected in order that they should not be manufactured in other countries by forgery, or even intellectual theft. Under these circumstances, within the negotiations for the adhesion to the Community Policy, Romania requested protection for several a traditional products, such as: milk, yogurt, fresh ewe, cheese, pressed cheese, traditional Romanian feta (telemea) cheese, sausages, black pudding, ranges of bacon, rolled head cheese, ham, alcoholic drinks, fruit distillates, etc.

As compared to modern agriculture, with all the associated operations included in a supply chain which begins with the investors and the manufacturing companies, and ends with traders and food processing companies, traditional agriculture is disappearing, and its place is gradually taken by an agro-alimentary industry. In what the modern tourism is concerned, agro-tourism might be offered chances of survival, but only when it is correlated with agricultural activities with the purpose of increasing its economic efficiency, through the compensation of its seasonality, and through the perpetuation of the occupational traditions and of the specific consumption.

## Case study: Research in the Carpathian and sub-Carpathian of the Arges County concerning the costs and efficiency of the traditional Romanian sheepfold products

The number of households that have applied for subsidies for sheep breeding (over 50 heads) and cattle breeding (over 3 heads) in 2009 has decreased dramatically. This has become a mere inventory problem, since subsidies will no longer be granted in 2010. There are several reasons for this problem, some related to certain objectives created by signing the adhesion to the EU, and others related to the lack of projects financed from European funds for the traditional Romanian farmers.

Within this case study, the number of sheep declared by Arges sheep flock owners ranges between 50-1500 sheep, but more than 60 % own maximum 100 sheep. The traditionally profitable sheep flocks counting more than 1,000 heads came to account for just 1.2 % of the total, which gives the first alarm signal in this field, according to the data taken from the farmers' applications for subsidies.

In the case of cattle, farmers frequently breed 1-4 heads, but what applicants for subventions are concerned, only 0.05% of the households (i.e. only 5) own an effective number of heads (over 100 cattle), able to generate long-term profits. Apparently, in the Arges County, in 2009, the number of households involved in the traditional sheep

breeding were subsistence households, i.e. more than 800 sheep breeding households (owning approximately 108 thousand heads) and more than 8,000 cattle breeding households (owning approximately 37 thousand heads). The polarization of the two population is extreme and the environment of the applicants for subsidies (approximately 135 heads of sheep and approximately 4 heads of cattle) reaches the dangerous limited level of the subsistence livestock breeding of the traditional households [Dinu, 1996, p.180], in addition to the nutritional impact of the animals in question (for example, cows can provide meet for 6-8 inhabitants if they are slaughtered, and milk for 10-15). At the same time, the number of applicants for subsidies for goats (over 25 heads) has increased to approximately 200 households with livestock of more than 12 thousand goats (with an average of approximately 60 heads).

The research methodology requires a broader initial presentation. Three localities from the Arges mountain area were selected: Corbeni, Rucăr and Domneşti within which the households were selected using the method of the array data structure, and the first list of twenty households was selected, based on the livestock size (we actually focussed on the efficient livestock breeding level) and some households offered to fill in a questionnaire based on (summarized in the annex), in which out guide was the ABF structuring guide (the traditional statistical research of the of the family budgets which has been performed by INS in Romania for over 70 years now), which we drastically reduced to only 4 pages (due to promptness needs and with the purpose of reducing the nonresponse). Out of the 14 households which provided data each month (reference period February 2010), only 9 provided complete databases for our study, the others being affected by incompleteness or undervaluation and omissions. Our small non-random guided sample, self-selected by free will and completeness, allowed for drawing conclusions related only to the general trends and structures, but we believe that they are sufficient to give significant alarm signals concerning the evolution of sheep breeding in the south of the Carpathian Mountains. Due to the wide variety of incomes in terms of sources, periodicity and size, their presentation in a standard manner is difficult. The information related to the incomes of the 9 households included into the sample was obtained based on these households' own statements, due to the fact that no other practical estimation methods are known. Under these circumstances, the question is if the data obtained by the self-statement method are truthful. The specialized literature mentions that, in the developed countries, the omission or undervaluation may exceed 20-25% of the incomes and expenditures (which cannot be thoroughly controlled by globalization). The understatement of the incomes may be due to various reasons such as:

- even if certain incomes are not illegal, are omitted or are undervaluated when they are in conflict with moral standards and values;
- incomes are also understated due to the fact that people try to obtain welfare payments which are granted based on a certain upper limit or even on the absence of any income;
- incomes are also understated in order to avoid social reactions;
- maybe the person who supplied the information does not know that his/her spouse or other members of the family have additional incomes;
- the incomes obtained by selling the products made in the household are not

usually declared, etc.

Obviously, in our small case study, the incomes declared are distorted and hard to evaluate, but we can assess their limit to 35-40%. The risk of understatement is small or even inexistent in the case of incomes obtained from official business activities (salaries, pensions, allowances, etc). Some categories of incomes were approximated, because the persons who answered the questions did not have a clear idea about the level of these incomes. The incomes associated to the own consumption were estimated with an approximation method which took into account the fact that they are hard to quantify. The annualization of the monthly data by questions related to the incomes and expenditures was required with the purpose of understanding how these households can survive for long periods of time without covering their expenses by appropriate incomes. Such an intervention called "annualization" extended the level of errors and omissions to more than 40%, towards 50%. Unfortunately, a monthly research for a continuous period of 12 months is neither possible (due to the absence of the members of the household, in the months with a major impact on sheep breeding) nor accepted by the head of the family cautious in an environment with fluctuant tax policies.

*Box 1 - Methodological references of the research*

The annual incomes per head of sheep are assessed based on the following knowledge:

- in spring, for a period of 2 months, 4 kg of traditional feta cheese/head of sheep are obtained and sold for 15 lei/kg ;
- in spring, for a period of 2 months, 3 kg of bladder cheese /head of sheep are obtained and sold for 30 lei/kg ;
- a slaughtered lamb is sold for approx. 10kgx20 lei/kg = 200 lei ;
- the annual income for one sheep is approximately 2x4x15+2x3x30+200 = 500 lei

The annual incomes for one head of cattle are assessed starting from the following aspects:

- the milk output is 10 -15 l/day ;
- a cow is milked approximately 9 months per calendar year;
- one kg of cow cheese is made from 5 l of milk, and is sold for 8 lei/kg ;
- the total incomes from the cow milk sold (the sheep milk is not sold) is 10,768 lei for the 9 studied households (see annex no.1) ;
- the total number of cows owned by the 9 studied households is 76 head ;
- the equivalent value of the milk sold /head of cattle = 10,768 /76 = 142 lei, i.e. 142 : 2.5 lei/l = 57 litres of milk sold /head of cattle;
- the annual income obtained from the cow cheese sold = [(15x30x9)-57] /5x8 = 6,388 lei ;

- taking into account that the percentage of the own consumption of the household 40% of the cow cheese obtained, the net income per head of cattle will be : 6,388-6,388x40% =3,833 lei ;

- the incomes obtained from a calf sold can be approx. 40 kg x10 lei/kg = 400 lei ;

- so, the approx. net annual incomes per head of cattle are : 142 + 3,833 +400 = 4,375 lei;

The expenses per head of sheep, or per head of cattle are assessed based on the information collected from the 9 households included in the final sample, based on the following information:

- the fodder costs for one head of cattle are 5 times higher than the fodder costs for one head of sheep;

- from the point of view of the fodder costs, we establish that one cow is the equivalent of 5 sheep;

- thus the cows owned by the 9 households represent 380 sheep ;

- the total number of equivalent sheep is 380 + 2,650 = 3,030 head;

- the total costs per head of sheep = 19,6981 : 3,030 = 65 lei /head of sheep;

- the total costs per head of cow = 65x 5 = 325 lei / head of cow;

Based on the results obtained, we assess the efficiency per head of sheep, or per head of cow, as follows:

- the annual profit per head of sheep = 500 – 65 = 435 lei ;

- the annual profit per head of cow= 4375 – 325 = 4050 lei ;

The information estimated above represents the optimum value of the results obtained per head of sheep, or per head of cow. Due to the fact that the structure and the profitability are different from one household to another, the data are obviously defined in a spectral manner by broad variation ranges.

Taking into account that the number of the members of a household varies from one family to another, the analysis of the total incomes reveals that an increase in the incomes should be analysed in comparison with the number of persons. For example, a significant increase is noticed when passing family with one member from to a family with two members. A bigger number of members of a household is associated with a more modest increase in the incomes, and in larger families there are even cases of decrease in the incomes. Incomes from agriculture cover one third of the consumer requirement.

In our presentation, we used the least volatile values, i.e. the average values. These values are briefly shown in the table below:

*Table 1 - Main indicators of the average budget of a studied household in February 2010*

| INDICATOR DESIGNATION | **Average value /household** | **Average value / person** | **-in significant %** |
|---|---|---|---|
| **TOTAL INCOMES (lei)** | 15,243 | 3346 | |
| 1.receipts | 1,384 | 304 | 9.1% |
| 2.Products sold | 2,750 | 604 | 18.0% |
| 2.1. basic products (milk) | 1,031 | 226 | |
| 2.2. dairy products | 1,718 | 377 | |
| 3. Slaughtered animals sold | 4,587 | 1007 | 30.1% |
| 4. Meat products sold | 197 | 43 | 1.3% |
| 5.Livestock sold | 6,291 | 1381 | 41.3% |
| 6.Alcoholic drinks | 33 | 7 | 0.2% |
| **TOTAL EXPENSES (lei)** | 16462 | 3614 | |
| **I. Household expenses** | 2,473 | 543 | 15.0% |
| 1.1. Costs of products for consumption | 724 | 159 | |
| 1.2. Fuel costs | 907 | 199 | |
| 1.3. House maintenance costs | 842 | 185 | |
| **II. Direct livestock expenses (hay, fodder)** | 6,804 | 1,494 | 41.3% |
| **III. Other indirect costs** | 7,185 | 1,577 | 43.7% |
| 3.1. Fodder and animal food costs (pasture-related costs) | 4,665 | 1,024 | |
| 3.2. Livestock caretakers' wage costs | 1,956 | 429 | |
| 3.3. Veterinary treatment costs | 375 | 82 | |
| 3.4. Own or rented pasture maintenance costs | 150 | 33 | |
| 3.5. Other expenses | 39 | 9 | |
| **Final financial result** | -1,219 | -268 | |

## Conclusions

A few of the alarming conclusions of the analysis, starting from the approach of the structure and trend related to this data affected by a 35-40% error ratio which is relatively reasonable for this type of research, (the data is given for February, is relatively more stable and is not annualized under this form of presentation), are as follows:

- the activity is highly seasonal in terms of incomes, due to the distribution of most of the incomes on two main periods, marked by the Easter holidays and shepherd's folk feast Nedeea, at the and of the cyclic transhumance (March–April, and the end of August–September);
- for 10 months per year, the budget of the sheep breeding household experiences a loss,

due to which support of subsidies are required (either through Government intervention, or through other tourist activities in which funds, programmes and projects focused on European resources may finance the necessary investments);
- the medium and long-term trend indicated by these incomes is very alarming, due to the fact that approximately 71.4% coming from occupational self-destruction by slaughtering the animals for survival, to an extent far beyond the normal limits (the average budget indicates that the sales of the meat coming from the slaughtered animals account for 30.1% and the sales of livestock represent 41.3%);
- the local meat products tend to disappear much faster than expected from the sheep breeding tradition in times of crisis (the sales of meat products now represent only 1.3 % of the average budget incomes);
- the self-consumption is increasing due to insufficient incomes in the periods with high pressure exercised by expenses (the monthly average purchased food product expenses per person are approximately 160 de lei, while the other food products required in order to perform a strenuous physical activity are provided from the own production thus increasing the consumption);
- almost 70 % of the expenses are related to the food for animals, as well as direct expenses incurred for the livestock increase (hay, fodder and investments in livestock) or indirect expenses (related to pastures, sheepfold, caretakers, pasture maintenance, etc.);
- the profitability of the sheepfold or "traditional sheep breeding business enterprise" is no longer stable [Murgescu, 1996, p.67] and tends to become bankrupt;
- the temporary survival solution has increased the importance of cattle breading, but the structural impact on the livestock generates the mixture and elimination of traditional sheep breeding (the number of cows is increasing in the mixed livestock, as compared to the number of sheep), so that the sheep has ceased to represent "the main means of production in the traditional sheep breeding activity" [Murgescu, 1996, pages 68-70].

Highland and lowland shepherds, Transylvanian shepherds or traditional sheep breeders tend to become mere historic references and are not replaced by other professions or occupations in rural areas, which seem to disintegrate due to lack of support, to the much too high burdens... The profitability of the sheep breeding occupation was never limited to its specific food products, and covered, instead, sometimes unimaginable social and even cultural forms. What kind of tourism product can be relevant and original in a mountain village without specific local products, customs, culture or calendar and space?

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*** The collection of the publication Financiarul, 2008-2010.

Economics of agriculture
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UDK: 631.453

# ELECTRIC FIELDS FROM HIGH-VOLTAGE POWERLINES AFFECT SOIL *Penicillium sp.* ACTIVITY IN AGRO-ECOSYSTEMS

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## Abstract

*Amid increasing concerns over the food chain and ecological agriculture, raises the question whether the intense extra low frequency (ELF) electric (EF) and magnetic fields (MF) emanating from high voltage power-lines might be affecting microorganisms in the environment in topsoils below them. Their habitat in topsoils affords an easy route into the food chain, since arable lands and pasturelands are highly integrated agro-ecosystems.*

*Since so far there had not been found a single organism or its part that would not be susceptible to EM fields, the aim of this investigation was to find if a soil microorganism Penicillium sp) could be affected by such fields and to what extent. Culture of that fungus derived from the same site's topsoil was exposed to 400, 275 and 132 kV powerlines, being placed under their midspans. Our results suggest possible impact of examined fields on certain elements of soil physiology.*

***Key words**: agro-ecosystems, Penicillium sp., soil microorganisms, electro-magnetic fields, high voltage powerlines*

## Introduction

Presence of microorganisms in soil measures by up to ten million cells per gram of soil, bacteria and fungi making the greatest portion. Soil microorganisms are essential for the maintenance of soil physiology, since they are involved in vast majority of chemical transformations in soil. Microbial activities in the cycles of nutrients required for plant

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growth are responsible for soil fertility. They transform organic matter that enters the soil (dead plant and animal cells and excretory products) into minerals, making it available to primary producers. In symbiosis with certain mycorrhizal fungi, leguminous plants roots can acquire the capability of fixing nitrogen. Some other soil microorganisms can increase the amount of nutrients present in the soil. Microorganisms that improve the soil fertility and contribute to plant growth are called biofertilizers and are used as microbial inoculants in agriculture. Phytostimulators are microorganisms that produce vitamins and plant hormones and can both improve plant health and contribute to higher yield.

During the last fifty years, for the first time during their existence and evolution, microorganisms have been continually exposed to electromagnetic fields emanating from various sources, including high voltage powerlines (Galonja *et al.,* 1999) that directly spread over pasturelands and arable lands. Based on vital role of microorganisms in soil physiology and the fact that electromagnetic fields are used to stimulate seed germination, the concern about possible adverse effects of electromagnetic fields on soil microorganisms emerges. Some high and low frequency electromagnetic fields are known for their capability of causing significant changes in microorganisms (Reese *et al*., 1998; Cellini *et al*., 2008; Ratushnyak *et al*., 2008), acting as stress factors.

## Materials and methods

For the experimental exposure of microbial cultures, three sites were selected under the midspans of 132, 275 and 400 kV powerlines that crossed similarly characterized topsoil. A common soil fungus (*Penicillium sp.*) derived from the site's topsoil was cultured in Agar for fungi (Merck, Leicester, UK), taking care about avoiding all unnecessary exposure to electromagnetic fields emerging from the laboratory apparatuses. To achieve that, an air jacketed incubator was used (Stuart Scinetific Incubator SI 60, Stuart Scinetific Ltd., England) instead of usual water jacketed incubator, which generates high internal electromagentic fields.

*Penicillium* acted as a representative eukaryotic microorganism that is a regular inhabitant of agricultural soil rich in organic matter. Its importance in soil is based on their capability of solubilizing various mineral matter, such as rock phosphates (Asea *et al*., 1998), making them available for plants.

Fungi were placed on agar in sealed test tubes with stoppers enveloped in aluminium foil to allow the exposure to the electric field. The control samples were prepared the same way. Two samples from the same batch of each organism type were left under the powerlines and a third was placed some 70 metres distant. Cultures were left in place for 5 and 10 days. Fungal morphology was examined microscopically. Control samples were kept under the same temperature conditions as the exposed samples, out of reach of electro-magnetic fields, shielded in mu-metal containers.

Electric and magnetic fields were monitored by EMF metar ( Delta-T Devices, Cambridge, England), constructed in accordance with IEEE (Institute of Electrical and Electronic Engineering) i IEC (International Electrotechnical Committee) standards.

It consists of 20 cm orthogonal magnetic field probe, one bipolar vertical electric filed probe as well as humidity, temperature and light conditions probes. Readings were collected by Delta-T Devices dataloger. Characteristics of electric and magnetic fields the samples were exposed to were as shown in next table.

*Table 1: Some characteristics of the fields samples were exposed to*

| power line | 400 kV | | 275 kV | | 132 kV | |
|---|---|---|---|---|---|---|
| location | beneath | distant | beneath | distant | beneath | distant |
| EP (V/m) | 160-370 | 3 | 50-80 | 2 | 2 | 1 |
| MP (μT) | 1 | 0,08 | 0,7 | 0,08 | 0,04 | 0,03 |

Electric field strength (EF) in case of 400 kV power line extremely varied during the day, so it is shown as the interval of variation. The parameters for other two transmission lines varied within 10 percent and are shown as average values of the readings.

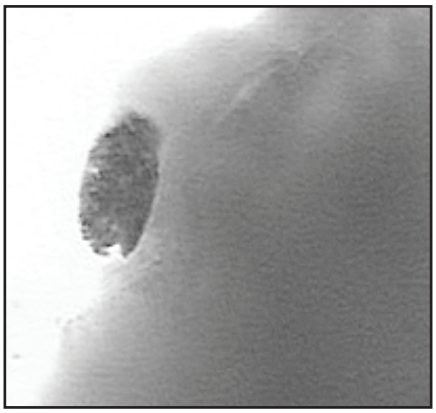
## Results

By visual macroscopical examination of fungal samples, presence of yellowish-orange exudate on the surface of fungal colonies was revealed. The amount of exudate seemed to bee in linear correlation with field strengths applied. The exudate was clearly present in the samples kept under the 400 kV and 275 kV transmission lines while slightly present in the samples kept under the 132 kV lines. In the control samples kept in mu-metal container for EMF protection, in the laboratory and under the same temperature conditions as those in the field, no orange exudate was found. For visual examination, numbers from 0 to 3 were used to describe levels of exudate present. Zero refers to absence of exudate, 1 to slight presence, 2 to moderate presence and 3 to strong presence of exudate (Table 2).

*Table 2: Presence of exudate on the surface of fungal colonies, exposed to electric fields from respective powerlines for 5 and 10 days*

| Initial state | 0 | | |
|---|---|---|---|
| **Powerline (pl)** | **Placement (powerline)** | **5 day exp.** | **10 day exp.** |
| 400 kV | Under midspan | 3 | 3 |
| | 70 m distant | 2 | 0 |
| 275 kV | Under midspan | 3 | 3 |
| | 70 m distant | 0 | 1 |
| 132 kV | Under midspan | 2 | 1 |
| | 70 m distant | 1 | 0 |
| Control sample (laboratory) | | 0 | 0 |

Microscopic analyses confirmed that exudate presented fruiting bodies (kleistoteciae), responsible for sexual reproduction in fungi (Picture 1). It is worth noting that fungi often convert to sexual reproduction as a response to various stress factors, such as temperature changes or lack of food.



*Picture 1 – Open kleistotecia in fungal sample kept for 10 days under 400 kV power line*

## Conclusions

The results obtained indicate that some soil microorganisms are susceptible to environmental electromagnetic fields. High voltage power lines acted as a source of stress factors, resulting in switching to stress-response behaviour (sexual reproduction). It is notable that most fields applied induced faster proliferation (Galonja Coghill *et al*., 2008).

Thoroughly studied and precisely aimed, alternating electric and magnetic fields could enable improving of microbiological component of soil.

Knowing that soil shelters lots of potentially harmful microorganisms as well, an investigation into electromagnetic patterns regarding various microorganisms is needed.

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UDK: 332.1:631/635:504.05/.06

# REGIONAL DISPARITIES IN THE EUROPEAN UNION: POLICY OBJECTIVES, THE POOREST REGIONS AND MULTIFUNCTIONAL AGRICULTURE

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## Abstract

*The main aim of this paper is to identify regional disparities in the European Union and position of the agriculture in that context. In the paper are analyzed: the first, policy objectives of the EU policies in overcoming the regional problems; second, the proportion of the regional disparities and position of agricultural regions; third, the regional policies of the EU point to solving those problems. It is concluded that the poorest regions of the EU consist mostly agricultural activity and the EU budget for the period 2007-2013 has been extended in order to provide resources for alleviating regional disparities. When the Monetary Union was established apart from traditional motives for implementing a regional policy such as solidarity and facilitating Single Market functioning appeared a new reason. Monetary policy can be helped with regional policy in solving the problem of asymmetric shock.*

***Key words****: policy objectives; regional disparities, the poorest regions; multifunctional agriculture; regional policies, budget*

## Objectives of the regional policy

The European Union set main objectives to itself in order to solve regional disparities, in the same way as other countries, especially with federal order. Therefore, the main objectives on those fields are following: first, to assist the development of areas lagging behind: second, to reduce regional imbalances in the Member States, that is, to solve the so-called cohesion problem (Tondl, G.,2001.,181.). There are numbers of arguments advocating necessity of the objectives to be realized. Researchers of the European union`s integrations pursued the next explanations (Molle, W.,1997., 419-20). First, The European Union justifies regional policy actions as a matter of solidarity between reach and poor areas of the European Union. Second, the major goal of a common regional policy was to facilitate the restructuring pressure on poor economic

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regions associated with creation of Single Market by supporting the modernization of their economic system. With the implementation of the European monetary union, which puts its member under a single monetary policy, a new outstanding argument has been appeared still. Common regional policy could become an important instrument in solving the problems of asymmetric shocks (Bayomi, T., Einchengreen, B., 1993.., 193-229).There are a number of explanations about a need of alleviating regional imbalances in literature. Two, on a certain way aggregation arguments are considered to give the good base for justifying those kinds of engagements. First, the benefit of alleviating regional imbalances is not unilateral. A region which receives subsidies for enhancing its economic performances mostly has certain external effects. In agricultural regions, for example, recipients of subsidies could contribute the better equipment of producers, rising productivity and offer production under low prices; on the other hand, consumption of cheaper agricultural products have wide effect on family budget and further, on the possibility of decreasing ( or slower growth) wages in the contributed regions. Preventing undesirable migration can be included in such considered contributions of the regional's imbalances correction. Besides, enhancing purchasing power of undeveloped regions extended the market for the producers from the contributed regions. In that context, the motivations of Germany or Holland for implementing Common Regional Policy should be understood. Second, macroeconomic stabilization policy has a regional policy of its own. Restraint inflation in regions can affect unemployment in others. Therefore, the direct intervention through regional policy can help to correct the previous shocks produced by monetary policy. But, there are the political reasons behind the economic one, mentioned above. The less developed European countries through long-term political negotiations have achieved to provide a compensation mechanism for potentially negative effects of economic integration (Allen,D., 1996,).

## Regional dimension of the imbalances in the EU and agriculture

The regional problems in the European Union could be reduced, for the analytical purpose, on two poles: on the poorest and the richest regions. In the methodological sense this research uses NUTS 2 classification, at region, from 800.000 to 3.000.000. inhabitans (Table 1)

*Table 1.Richest and Poorest NUTS 2 Regions ( GDP PPP 2007)*

| **Member State** | **Region** | **GDP per capita** | |
|---|---|---|---|
| | | in Euros | **As % of EU-27 average** |
| European Union | | **24,900** | 100.00% |
| Austria | | 30,600 | 122.80% |
| **Richest** | Wien | *40,600* | 163.1 % |
| **Poorest** | Burgenland | *20,300* | 81.4 % |

| | | | |
|---|---|---|---|
| Belgium | | 28,800 | 115.70% |
| **Richest** | Bruxelles-Cap., Brussels Hfdst. | *55,000* | 220.9 % |
| **Poorest** | Hainaut | *18,700* | 75.3 % |
| Bulgaria | | **9,400** | 37.70% |
| **Richest** | Югозападен | *15,400* | 62.0 % |
| **Poorest** | Северозападен | *6,400* | 25.6 % |
| Cyprus | | 23,300 | 93.60% |
| Czech Republic | | **19,900** | 80.10% |
| **Richest** | Praha | *42,800* | 171.8 % |
| **Poorest** | Severozápad | *15,400* | 61.7 % |
| Denmark | | **30,200** | 121.30% |
| **Richest** | Hovedstaden | *37,400* | 150.3 % |
| **Poorest** | Sjælland | *22,800* | 91.4 % |
| Estonia | | **17,100** | 68.80% |
| Finland | | 29,400 | 118.00% |
| **Richest** | Åland | *35,700* | 143.0 % |
| **Poorest** | Itä-Suomi | *22,100* | 88.8 % |
| France | | 27,000 | 108.50% |
| **Richest** | Île-de-France | *42,000* | 168.7 % |
| **Poorest** | Guyane | *12,100* | 48.7 % |
| Germany | | 28,800 | 115.80% |
| **Richest** | Hamburg | *47,800* | 192.0 % |
| **Poorest** | Brandenburg-Nordost | *19,000* | 76.1 % |
| Greece | | 23,600 | 94.30% |
| **Richest** | Αττικής | *31,900* | 128.1 % |
| **Poorest** | Δυτικής Ελλάδος | *14,900* | 59.7 % |
| Hungary | | **15,600** | 62.60% |
| **Richest** | Közép Magyarország | *25,600* | 102.9 % |
| **Poorest** | Észak Alföld | *9,800* | 39.4 % |
| Ireland | | 36,900 | 148.10% |
| **Richest** | Southern and Eastern | *41,400* | 166.1 % |
| **Poorest** | Border, Midland and Western | *24,700* | 99.2 % |
| Italy | | 25,800 | 103.40% |
| **Richest** | Lombardia | *33,600* | 134.8 % |
| **Poorest** | Calabria | *16,400* | 65.8 % |
| Poland | | **13,600** | 54.40% |
| **Richest** | Mazowieckie | *21,700* | 87.1 % |
| **Poorest** | Podkarpackie | *9,100* | 36.7 % |

| | | | |
|---|---|---|---|
| Portugal | | 18,800 | 75.60% |
| **Richest** | Lisboa | *26,100* | 104.7 % |
| **Poorest** | Norte | *15,000* | 60.3 % |
| Romania | | **10,400** | 41.60% |
| **Richest** | Bucureşti - Ilfov | *23,000* | 92.2 % |
| **Poorest** | Nord-Est | *6,600* | 26.6 % |
| Slovakia | | 16,900 | 67.70% |
| **Richest** | Bratislavský kraj | *39,900* | 160.3 % |
| **Poorest** | Východné Slovensko | *11,500* | 46.0 % |
| Slovenia | | 22,100 | 88.60% |
| **Richest** | Zahodna Slovenija | *26,600* | 106.7 % |
| **Poorest** | Vzhodna Slovenija | *18,200* | 73.1 % |
| Spain | | 26,200 | 105.00% |
| **Richest** | Madrid | *34,100* | 136.8 % |
| **Poorest** | Extremadura | *18,000* | 72.4 % |
| Sweden | | **30,600** | 122.80% |
| **Richest** | Stockholm | *41,000* | 164.6 % |
| **Poorest** | Östra Mellansverige | *26,500* | 106.2 % |
| United Kingdom | | **29,100** | 116.70% |
| **Richest** | Inner London | *83,200* | 334.2 % |
| **Poorest** | West Wales & The Valleys | *18,300* | 73.4 % |

*Source: Eurostat, Regional GDP in the European Union, 2010*

The data Table 1. shows that the richest countries have the poor regions. The region can be mentioned in Germany: North Brandenburg which realize 72% out of average GDP of EU 27. On other hand this division is fully clear at the new member state. So, as example, the richest region in Bulgaria realizes only 52% out of average GDP of EU 27, but the poorest just 27%

In the discussion of those issues should point to the next:

The richest regions and/or overpopulated regions (expressions often used in literature about regional development in the EU) are, as a rule, areas of big towns. Those regions characterize strength presences second and third activity in an economy. Especially the emphasize is on the third activity which, above all, include: bank and insurance sector, consulting services, but also traditional sector activity as whole trade. In those regions, as we saw, exists severe exception from the average GDP of the EU towards higher levels. Those could cause divisions in the EU. Therefore, a certain dose of external intervention is necessity in order to eliminate or alleviate those problems in the shape of the regional policy EUThe poorest regions in the EU, as a rule, are highly dependents from agriculture; it overcomes in economy structure, in revenue and in employment. The poorest regions are mostly located in mountains (over 500 m above sea level) or hills

areas, as on islands. In those areas prevails an agriculture consisted of peasant households with semi natural or semicomercialized economic structure, investments in productions are small, productivity and revenue are on a very low level. If the PPP (purchasing power parity) in EU marks with 100, then , in those areas , besides the above mentioned , can be included Greece and some Spanish regions: Uperios (43); Madera (55); Ditiki Elda(57); Peloponnese(57); Andalusia (58)( Benres, A., 2000., quoted Jovanovic., M, 2004., 530). It can be emphasized that regional policy should be pointed to enhancing vitality of the peasant households and development of activity helping carrying out agricultural activity. Other words, development of so-called multifunctional agriculture (villages infrastructure, development of different kinds of crafts, small and medium size enterprises connected with agricultural activity, villages tourism etc) as a protection agriculture environment are the main tasks of regional policy.

## The regional policy of the EU for 2007-2013

The regional policy of the EU has transposed its goals for the period 2007-2013. The number of goals have been reduced to three and set up on the following way:

**Convergence** (formerly Objective 1): Regions whose per capita GDP is less than 75% of the EU average will be eligible; those are mostly the regions from the new member states which accessed the EU after 2004. Support will be temporarly given (untill 2013) to regions of the old member EU 15 where per capita GDP is below 75% as well. The goal is related to support for the growth and job creation.

**Competitiveness and employment** (formerly Objective 2); the goal has been designed to help the richer member states to cope with social and economic change. Employment initiatives are to be based on the European Employment Strategy (EES) what suppose job creation, adaptability of the workforce and accessibility to the labor market for the vulnerable person.

**Territorial co-operation** (new Objective). The goal is to stimulate cross-border co-operation in order to find a joint solution to problem such as rural, urban and coastal development, especially with the networking of SMEs

For the realization of that policy the legislative package was adopted (2006.), comprises one general and four specific regulations.

General regulation: The common rules in programming, managing, controlling evaluating the new regional policy; the emphasis added on environmental and accessibility issues and on the partnership principles that governs the whole policy.

1) A regulation on the European Regulation Development Fund (ERFD); to fund projects on research, innovation, environment, risk prevention, infrastructure in the least developed regions.

2) A regulation on the European Social Fund (ESF): to target projects for employment, quality and productivity at work and social inclusion – in line with the European Employment Strategy.

3) A regulation on the Cohesion Fund: to invest in environmental projects

and trans-European networks in number states with a GDP of less than 90% of the Community average National income.

4) A regulation on a new instruments, the European grouping of cross-border co-operation (EFCG); for cross projects.

In terms of financial resources, The European Council allocated 307,6 billion Euros (euractiv.com/en/future-eu/new-eu-cohesion-policy-2007-2013/article-131988) to realize the regional policy, for 2007-2013; 81% will be spent on Convergence regions, 15,8% will go to regions eligible under Competitiveness priority, and 2,44% will remain for European Territorial Cooperation.

## Conclusion

This paper help us to draw the following conclusions: The first, motives of the EU regional policy are, above all, solidarity between the member states and enhancing efficiency in Single Market functioning; with introducing monetary unions regional policy should help monetary policy in eliminating asymmetric shock; second, there are profound regional imbalances in the EU. Some regions, as example in Bulgaria, have realized below 30% out of the average GDP of the EU 27 while some, like Inner London in Great Britain more than 200% out of the average GDP in the EU 27; Third, the poorest regions are mostly based on agriculture activity; Fourth, the important resources have been provided in EU budget for the period until 2013 in order to overcome those proportion; Fifth, a concept of multifunctional agriculture should act the decisive role in developing agrarian areas.

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Economics of agriculture
SI – 2
UDK: 631.84:633.15

# EFFECTS OF NITROGEN FERTILIZING ON THE 1000-GRAIN WEIGHT OF MAIZE INBRED LINES

*Hojka Zdravko*[1]

## Abstract

*In this study the influences of three N fertilizers (urea = 46% N; calcium ammonium nitrate or CAN; ammonium sulphate) and their distribution (N-autumn; N-spring; N-50% autumn + 50% spring; N-33% autumn + 67% spring; N-100% spring based on N-$_{min}$ method test) on 1000-grain weight of two maize inbred lines (IL1 and IL2) were tested under conditions of Zemun Polje calcaric chernozem for three growing seasons (2001, 2002 and 2003) with aim of N fertilization optimization for seed-maize growing. The use of the N-$_{min}$ method test (N ranging from 17 to 35 kg ha$^{-1}$, in dependence on the soil mineral nitrogen content), especially in years with lower precipitation sums, resulted in the highest increase in 1000–grain weight (3.2%) of observed maize inbred lines in relation to the control. The application of different forms of nitrogen did not result in statistically significant differences in 1000–grain weight of observed maize inbred lines.*

***Key words:*** *Time of nitrogen application, Nitrogen form, Maize inbred lines, 1000-grain weight*.

## Introduction

Nitrogen is one of the most important nutritive elements, and it is used worldwide to enhance and sustain the production of agricultural crops. During the Green Revolution, nitrogen fertilisers contributed to the increase and sustainability of yields within different agroecological systems. Nitrogen was also a key of economic variability of the agricultural production all over the word, and by it of world population food. On the other hand, anthropogenic factors (combustion of fossil fuels) contribute to a greater release of gases (carbon dioxide and nitrogen oxides) that affect global warming of our planet (*IPCC, 1994*). The application of organic and mineral nitrogen

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fertilisers can result in losses of nitrogen in gaseous forms, as well as, in nitrite leaching. Therefore, as stated by *Newbould (1989)*, drinking water contamination with nitrates has been becoming a serious problem all over the world. These are principal reasons for continuation of the development of new technologies and methods of nitrogen applications that can increase efficiency of its utilisation. Procedures such as: band fertilisation, nitrogen application during the growing season, testing of new varieties with a greater efficiency of the nitrogen utilisation, crop rotation and alternation of crops, irrigation by the drop by drop system, determination of the nitrogen content in the soil with the aim to calculate necessary rates of fertilisers - are globally used as a conventional method of the agricultural production. New technologies of nitrogen fertilisers application and cropping, such as: precise technique of the plant production, fast *in situ* tests for the analysis of the nitrate nitrogen concentration in plant tissues, fast tests for the chlorophyll determination, use of the computer simulation models to improve planning and organisation of the production - can affect the increase of the average efficiency of the nitrogen utilisation within different agroecosystems by more than 50%. Moreover, the application of nitrification inhibitors and slow-release nitrogen fertilisers significantly affect a higher crop use of both, nutrient and water, and the reduction of nitrogen losses from the soil by approximately 50% (*Delgado and Mosier, 1996; Detrick, 1996; Engelsjord et al., 1997*).

The maize seed production is mainly performed on higher quality soils. Soil quality is a capability of the soil to satisfy requirements of crops (and therefore of animals), to provide transport and regulation of water and other compounds present in the soil or added to the soil (*Doran and Parkin, 1994; Karlen et al., 1998*).

Since there are usually no sufficient amounts of nitrogen in the soil available to plants, for obtaining high yields of good quality, soil fertilisation is necessary. The application of N fertilisers in the maize seed production represents an important cropping practice as it significantly affects the yield level and certain seed traits.

## Materials and methods

### ***The field experiment***

The field experiment was conducted for three growing seasons (the factor A: 2001, 2002 and 2003) with two maize inbred lines (the factor B: IL1 and IL2), six fertilization (the factor C–Table 1) and three N–fertilizers appliations (the factor D–Table 1) on the constant P and K fertilization (kg $ha^{-1}$: 60 $P_2O_5$ + 60 $K_2O$ as superphosphate and KCl ) was conducted on chernozem soil (Maize Research Institute in Zemun Polje).

The experiment was conducted in the randomized block design in four replicates. Gross of the basic plot was 28 $m^2$. Maize was sown by pneumatic sowing maschine in the terms as follows: May 8, April 24 and April 15, for 2001, 2002 and 2003, respectively (crop rotation after winter wheat). Weed control was made by incorporation of Eradicane (6.0 l $ha^{-1}$) by presowing soil tillage and pre–emergence application of Atrazin + Prometrin + Monosan (l $ha^{-1}$ = 1.0 +1.5+1.5) as well.

*Table 1. Forms and distributions of N by fertilization*

| N Fertilizer (the factor C) | Distribution of N in kg ha$^{-1}$ (the factor D) | | | | | | |
|---|---|---|---|---|---|---|---|
| | Period | D1 | D2 | D3 | D4 | D5 | D6** |
| C1 = urea (46% N: 100% $NH_2$-N) | Autumn | 0 | 100 | | 50 | 34 | |
| C2 = CAN* (50% $NH_4$-N + 50% $NO_3$-N) | Spring | 0 | | 100 | 50 | 33 | $N-_{min}$ |
| C3 = $(NH_4)_2SO_4$ (100% $NH_4$-N) | Dressing | 0 | | | | 33 | |
| | | 0 | D2-D6 (kg ha$^{-1}$): 60 $P_2O_5$ + 60 $K_2O$ | | | | |

* Calcium ammonium nitrate (26% N); ** $N–_{min}$ to 120 cm of depth + fertilization = 100 kg N ha$^{-1}$ (kg N ha$^{-1}$ = 35, 31 and 17, for 2001, 2002 and 2003, respectively).

Plant number reduction to the level of 60,000 plants ha$^{-1}$ was performed in early growth stage. The harvest was done on October 5$^{th}$, 2001; September 10$^{th}$, 2002; September 5$^{th}$, 2003 at the moment of physiological maturity of maize grain inbred lines. Harvested ears were dried at the seed drying and processing plant at the Maize Research Institute, Zemun Polje. Statistical analyses (LSD–test) were performed according to Mead et al., 1996.

Harvested by hand 4-5. October 2001, 10 September 2002. and 5 September 2003. in physiological maturity, grain and maize inbred lines were evaluated in yield that is at the 14% humidity. Statistical analysis (LSD test) were made according to Mead et al. (1996)

## ***Weather conditions***

Precipitation for the 6–month period (April–September2002), being the growing season, was within range of 30–year average (LTM), while in years 2001 and 2003 they were 46% higher and 30% lower than LTM, respectively. Temperature regime for maize growth was more favorable in 2001, compared to the other two years (Table 2).

*Table 2. Weather characteristics (Zemun Polje Weather Bureau: 44$^o$49$'$N, 20$^o$27$'$E)*

| Month | Weather characteristics (LTM = long–term means: 1961-1990) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Precipitation (mm) | | | Mean air–temp. ($^o$C) | | | LTM | |
| | 2001 | 2002 | 2003 | 2001 | 2002 | 2003 | mm | $^o$C |
| April (IV) | 148.8 | 54.8 | 14.6 | 11.0 | 11.6 | 11.2 | 48.3 | 11.2 |
| May (V) | 46.2 | 29.4 | 36.4 | 17.6 | 19.5 | 20.5 | 61.2 | 16.9 |
| June (VI) | 168 | 65.0 | 19.0 | 14.1 | 22.0 | 24.0 | 79.4 | 19.3 |
| July (VII) | 41.8 | 34.8 | 105.4 | 22.4 | 23.4 | 22.5 | 63.5 | 20.3 |
| August (VIII) | 35.0 | 105.2 | 26.4 | 23.6 | 21.6 | 24.3 | 52.3 | 22.1 |
| Sept. (IX) | 70.8 | 55.4 | 41.2 | 15.9 | 16.5 | 17.2 | 44.7 | 17.2 |
| IV-IX: Total | 510.6 | 344.6 | 243.0 | | | | 349.4 | |
| IV-IX: Mean | | | | 17.4 | 19.1 | 19.9 | | 17.8 |

In general, low yield of maize is connected with drougt stress, especially during July and August (Shaw 1988.; Josipovic et al., 2005.)

## Results and discussion

Forms and timing of nitrogen (N) application are important factors of plants growth and development, especially for maize inbred lines, which are used as parents in maize seed production (Binder et al., 2000; Vetsch and Randall., 2004).
Kling and Okoruwa (1994) and Okoruwa (1997) refer to several biological seed traits, while Miric and Brkic (2002) describe several dozens of different seed traits affecting sowing and having the importance for seed drying, transport, storing, packing and conservation. However, Miric et al. (2000) conclude that germination and 1000-grain weight are traits among a dozen of the most important sowing-technical and production-economical traits, because they specify both quantity and quality. The variety, soil tillage, crop density and uniformity, irrigation regime and fertilisation have greatest impact on 1000-grain weight. The effects of weather conditions, except during pollination and maturity are less important, while the fractioning has a crucial effect on 1000-grain weight.

In these investigations thousand-grain weight significantly varied over investigation years and genotypes (Table 3). Fertilization based on the $N_{min}$ method resulted in significantly greater 1000-grain weight compared with other fertilization variants performed, on the average for three years and all three forms of nitrogen. Applied nitrogen in the form of fertilizer did not differ in 1000-grain weight.

According to the fertilization date x nitrogen form interaction it can be concluded that significant differences occurred within certain fertilization variants. The inbred lines fertilization based on the $N_{min}$ method and distribution of N fertilizers in autumn and spring (D5: 34% + 66%) by the application of the amidic nitrogen (urea), resulted in significantly higher grain weight compared with using of CAN. On the other hand, 1000-grain weight was very significantly higher in the fertilizing variants D2 (single application of N fertilizers in autumn) and D4 (application of N fertilizers in autumn and spring: 50% + 50%) with CAN in relation to the urea. Grain weights did not differ over D3 variant (single application of N fertilizers in spring).

Observed maize inbred lines responded differently to nitrogen application dates. The inbred line IL1 had significantly lower seed weight in treatment with single application of fertilizers in autumn compared with other treatments. The highest 1000-grain weight in the inbred IL2 was obtained by the application of the $N_{min}$ method.

*Table 3. 1000-grain weight (g) of maize inbred lines*

| Factor | Year 2001 (A1) | | | Year 2002 (A2) | | | Year 2003 (A3) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Genotype (B) | | Mean | Genotype (B) | | Mean | Genotype (B) | | Mean | Mean |
| | IL-1 | IL-2 | | IL-1 | IL-2 | | IL-1 | IL-2 | | |
| | Influences of A, B C and interactions AB, AC and ABC | | | | | | | | | |
| Year (A) | **264.0** | | | **297.9** | | | **242.1** | | | |
| Genotype (B) | 3-year means: | | | **277.2** | **258.7** | | | | | |
| Interaction AB | **297.9** | **230.1** | Y2001 | **318.9** | **276.4** | Y2002 | **214.5** | **269.6** | Y2003 | |
| Interaction BC | **277.2** | **258.2** | $NH_2$-N | **275.9** | **259.3** | CAN | **278.7** | **258.6** | $NH_4$-N | |
| Fertilizer (C) | ABC | | **AC** | ABC | | **AC** | ABC | | **AC** | **C** |
| $NH_2$-N | 299.1 | 228.6 | **263.9** | 316.6 | 277.8 | **297.2** | 215.8 | 268.1 | **242.0** | **267.7** |
| CAN | 294.8 | 232.9 | **263.9** | 322.8 | 274.9 | **298.9** | 210.0 | 270.2 | **240.1** | **267.6** |
| $NH_4$-N | 299.6 | 228.9 | **264.3** | 318.9 | 276.5 | **297.7** | 217.5 | 270.5 | **244.0** | **268.7** |
| | Influences D and interactions AD, BD and ABD | | | | | | | | | |
| Distribution (D) | ABD | | **AD** | ABD | | **AD** | ABD | | **AD** | **D** |
| N-0 | 297.6 | 231.7 | **264.7** | 325.5 | 276.2 | **300.9** | 210.4 | 266.6 | **238.5** | **268.0** |
| N-100 autumn | 306.9 | 211.9 | **259.4** | 327.8 | 270.6 | **299.2** | 213.5 | 267.0 | **240.3** | **266.3** |
| N-100 spring | 284.2 | 241.5 | **262.9** | 312.2 | 267.5 | **289.9** | 226.6 | 257.0 | **241.8** | **397.3** |
| N 50a+50spr | 282.4 | 234.6 | **258.5** | 316.0 | 278.5 | **297.3** | 219.9 | 268.1 | **244.0** | **266.6** |
| N 34a+66spr | 309.5 | 229.2 | **269.4** | 312.9 | 264.3 | **288.6** | 216.4 | 261.0 | **238.7** | **265.6** |
| N-min spring | 306.6 | 232.0 | **269.3** | 322.1 | 301.2 | **311.7** | 200.0 | 297.8 | **248.9** | **276.6** |
| | Interactions ACD and CD (a= $NH_2$-N; b=CAN; c= $NH_4$-N) | | | | | | | | | |
| | Year 2001 (A1) | | | Year 2002 (A2) | | | Year 2003 (A3) | | | 3-year means |
| | a | b | c | a | b | c | a | b | c | a b c |
| | ACD | | | ACD | | | ACD | | | CD |
| N-0 | 265 | 265 | 265 | 301 | 301 | 301 | 238 | 238 | 238 | 268 268 268 |
| N-100 autumn | 262 | 258 | 258 | 289 | 313 | 300 | 224 | 256 | 241 | 259 276 264 |
| N-100 spring | 257 | 265 | 267 | 293 | 295 | 282 | 244 | 245 | 236 | 264 268 262 |
| N 50a+50spr | 242 | 270 | 264 | 293 | 301 | 297 | 238 | 249 | 244 | 258 274 268 |
| N 34a+66spr | 275 | 265 | 268 | 296 | 265 | 304 | 244 | 218 | 254 | 272 249 275 |
| N-min spring | 283 | 261 | 264 | 311 | 318 | 307 | 263 | 233 | 250 | 285 271 274 |
| | | | | | | | | | | |
| Analyses of variance (LSD-test to levels 5% and 1%) | | | | | | | | | | |
| | A | B | C | D | AB | AC | AD | BC | CD | ABC ABD ACD |
| LSD 5% | 3.3 | 20.1 | 3.3 | 4.7 | 4.7 | 5.8 | 8.2 | 4.7 | 8.2 | 5.2 6.3 7.1 |
| LSD 1% | 4.4 | 26.5 | 4.4 | 6.3 | 6.3 | 7.7 | 10.8 | 6.3 | 10.8 | 7.0 8.7 9.3 |

These data differ from the results obtained by other study (Jovin and Vesković, 1997) which showed that the highest 1000-grain weight had been obtained by the application of the greatest fertilizer rate (N-150 kgha$^{-1}$, $P_2O_5$ -120 kgha$^{-1}$ and $K_2O$-80 kgha$^{-1}$).

Similar investigations were made by others (Gotlin et al., 1981; Ćirović, 1985; Cirilo and Andrade, 1994; Uhart and Andrade, 1995; Maksimović, 1997; Purcino

et al., 2000). For example, by testing 1000-grain weight of maize inbred lines and hybrids by fertilization for 3-year period, increase of soil moisture and application of N fertilizers affected the increase of 1000-grain weight. The use of N fertilizers showed considerable influences on maize 1000-grain weight and resulted in 30-40% higher yield in comparison with the unfertilized plot. 1000-grain weight depended on application of N fertilizers and these effects were different for individual maize hybrids.

## Conclusions

According to the statistical analysis of effects of fertilisation dates and nitrogen forms on the 1000-grain weight of maize inbred lines, very significant differences were obtained over different investigation years and genotypes. It can be concluded that each inbred has its own potential for magnitude and range of variations for the observed trait.

Fertilizing on the basis of the $N_{min}$ method resulted in very significantly higher 1000-grain weight compared with other fertilization variants, on the average for all years, genotypes and all three nitrogen forms used. The use of the $N\text{-}_{min}$ method test (N ranging from 17 to 35 kg $ha^{-1}$, in dependence on the soil mineral nitrogen content), especially in years with lower precipitation, resulted in the highest increase in 1000–grain weight (3.2%) in all maize inbred lines tested, compared with the control. The application of different forms of nitrogen did not result in statistically significant differences in 1000–grain weight of maize inbred lines tested.

Thousand-grain weight is an important sowing-technical trait mainly conditioned by inheritance, but partially subjected to certain cropping practices. It is considered that 1000-grain weight close to a mean for a given hybrid is desirable. Namely, the overweight means a small number of grain per a unit of the harvested area, as it is case with the inbred lines. This trial shows variations of this trait within a population, which is a result of inheritance.

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Economics of agriculture
SI – 2
UDK: 635.1/.8:339.564

# ECONOMIC ASPECTS OF SERBIAN COMPARATIVE ADVANTAGES IN EXPORTS OF VEGETABLE MATTER

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## Abstract

*Increase of exports of goods and services is needed in domestic economy in order to reduce foreign trade deficit. Reduction of the negative balance directly affects the level of funds needed to pay for imports and service external debt.*

*The paper points out the tendency of foreign trade and macroeconomic aspects of exports. The paper seeks to quantify the degree of comparative advantage of Serbia's exports of medicinal, aromatic and spice herbs and other raw plant materials.*

***Key words***: *competitiveness, medicinal herbs, export, import*.

## Introduction

The competitiveness of Serbian economy is conditioned by modernization and structural changes in production, program organization, increasing productivity and efficiency in production and an encouraging and developmental economic policy.

Serbia has a high deficit in foreign trade. High external deficit is characteristic of the transition process because it occurs due to structural changes, significant capital inflow and convergence towards the developed countries of the European Union. However, the deficit is also the result of unfavorable economic activities, inadequate production structure, product quality, lack of competitiveness, insufficient economic incentives, customs and economic policy.

Increase of exports of goods and services is needed in domestic economy in order to reduce foreign trade deficit. Reduction of negative balance directly affects the level of funds needed to pay for imports and foreign debt servicing.

In order to observe the fundamental economic factors that shape the market structure,

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production structure, trade balances and products should be considered. Specialization in the production of certain product groups defines the form of trade structures. Favorable export performance of agriculture and processing industry of Serbia in recent years reflect the interdependence of processes at the international and domestic markets. The paper analyzes the status and prospects of export of medicinal and aromatic herbs and other raw plant material. The research is based on quantitative analysis; a methodological framework is based on the application of scientifically relevant indicators of international trade, which includes indicators of comparative advantage and specialization in international trade. The coverage of imports by exports of selected products was analyzed as well.

## Comparison of the export-import parameters

**By comparing the achieved scope and value of exports it is possible to analyze changes that occur in the time period.** The results obtained are used for market segmentation, definition of export policy and the development of competitiveness. [3] In the research of economic factors that define market structure special attention should be devoted to production potentials, balance of trade and specialization in the production of certain product groups.

*Table 1. Exports and imports of selected product groups: spices and raw plant materials from Serbia in 2008 (in thousands of USD)*

| PRODUCTS | EXPORTS | IMPORTS |
|---|---|---|
| Pepper of the genus "capsicum" or pimento | 8,980.00 | 1,378.00 |
| Fennel seeds and juniper | 805.00 | 79.00 |
| Vegetable wicker materials | 502.00 | 53.00 |
| Chamomile | 580.00 | 124.00 |
| Mint | 990.00 | 199.00 |
| Other herbs for perfumery | 3,742.00 | 1,673.00 |
| Alfalfa | 974.00 | 385.00 |
| Fruit trees, grafted or not | 12,894.00 | 7,154.00 |
| Roses, grafted or not | 1,720.00 | 78.00 |
| Plant materials for the production of brooms and brushes | 1,112.00 | 4.00 |

*Source: Statistical Office for the respective year*

*Table 2 Exports and imports of selected product groups: spices and raw plant materials from Serbia in 2005 (in thousands of USD)*

| PRODUCTS | EXPORTS | IMPORTS |
|---|---|---|
| Pepper of the genus "capsicum" or pimento, dried | 5,391.00 | 372.00 |
| Fennel seeds and juniper | 378.00 | 3.00 |
| Vegetable wicker materials | 338.00 | 24.00 |
| Chamomile | 501.00 | 46.00 |
| Mint | 793.00 | 28.00 |
| Other herbs for perfumery | 2,102.00 | 851.00 |
| Alfalfa | 344.00 | 706.00 |
| Fruit trees, grafted or not | 7,098.00 | 643.00 |
| Roses, grafted or not | 875.00 | 44.00 |
| Plant materials for the production of brooms and brushes | 790.00 | 98.00 |

*Source: Statistical Office for the respective year*

Surplus in foreign trade in medicinal and aromatic plants has increased at a rate of 15.17% per year. **Increase in surplus** is the result of higher export prices. Export prices of this product group increased at a rate of 12.13% per year.

**The rate of increase of export in sectors was analyzed: coffee, tea, cocoa, spices and animal and plant raw materials and product groups spices and plant raw materials, aggregated to the level of products.** [5]

**Export in the sectors of coffee, tea, cocoa and spices increased at a rate of 24.09% and in the sector of animal and plant raw materials it increased at the rate of 15.53% per year.** Export of product groups of spices and plant raw materials increased at a rate of 19.20% and 15.68% per year. **The highest rates** of export increase have the following products: fennel seeds and juniper ($r_g$ = 28.66%), alfalfa seed ($r_g$ = 41.47%) and fruit trees, grafted and not grafted ($r_g$ = 25.27%).

## Export-import ratio

**Sectors of coffee, tea, cocoa and spices** in 2008 had a negative export-import ratio ($r_{ij}$ = 37.59%), i.e. recorded a deficit in foreign trade. Within that sector, **product group of spices** ($r_{ij}$ = 225.18%) had a very high export-import ratio and all analyzed products recorded positive coverage ratio.

At the level of **the sector of animal and plant raw materials** in 2008 Serbia had a negative export-import ratio ($r_{ij}$ = 49.79%) and the commodity group of plant raw

materials had a negative export-import ratio ($r_{ij}$ = 47.25%). All analyzed products have a positive export-import ratio.

Export-import ratio for products in groups SITC 075 and 292 rev.3. in 2008 was reduced compared to 2005 (except for products: alfalfa seed, roses, grafted or not, and plant materials for the production of brooms and brushes).

## Relative export-import ratio (RPU)

**The high value of RPU of sectors of food and live animals** tells about a favorable balance of export and import and can be considered the holder of export expansion in Serbia. **RPU of the sector of raw materials, excluding fuel** was low, but positive.

**RPU of the sector of coffee, tea, cocoa and spices** is negative both in 2005 and 2008, i.e. a deficit in trade of these products was recorded ($RPU^{2005}$ = 28.22%; $RPU^{2008}$ = 28.05%). Relative export-import ratio of **commodity group of spices** is high ($RPU^{2005}$ = 856.12%, $RPU^{2008}$=592.59%).

**RPU of the sector of animal and plant raw materials** in 2005 was positive ($RPU^{2005}$ = 153.10%), while in 2008 there was a trade deficit ($RPU^{2008}$ = 97.63%). **Commodity group of plant raw materials** had a deficit in foreign trade in both years ($RPU^{2005}$ = 96.17%, $RPU^{2008}$ = 94.49%).

**Most favorable ratio of relative coverage of imports by exports in 2005 had the products: fennel seeds and juniper** ($RPU^{2005}$ = 3974.76%), vegetable wicker materials, other ($RPU^{2005}$ = 2271.51%), chamomile ($RPU^{2005}$ = 1756.66%), mint ($RPU^{2005}$ = 4567.97 %), fruit trees, grafted or not ($RPU^{2005}$ = 1780.46%), roses, grafted or not, ($RPU^{2005}$ = 3207.48%) and plant materials for the production of brooms and brushes ($RPU^{2005}$ = 1300.20%).

**In 2008, RPU coefficient of most products was reduced, and better ratio** of relative coverage of imports by exports had the products: other herbs for perfumery ($RPU^{2008}$ = 475.89%), alfalfa seed ($RPU^{2008}$ = 538.27%), roses, grafted or not ($RPU^{2008}$ = 4691.76%) and plant materials for the production of brooms and brushes ($RPU^{2008}$ = 59148.94%). **Products with reduced RPU coefficient in 2008** can compete in world merchandise trade of Serbia (presented data RPU> 100%) [1].

## Grubel-Lloyd index (GL)

**The value of GL index for the two analyzed sections in 2005 and 2008 had the following values: both sections in 2005** had intra-industrial character. **Sectors of coffee, tea, spices** had the same level of intra and inter-industrial exchange **in 2008,** and the sector of animal and plant raw material had lower level of intra-industrial trade. To obtain a complete picture of the level of specialization, analysis of the value of GL index at the lower level of data aggregation was performed. **Export of products with prominent inter-industrial character in 2008 was the following:** plant materials for

the production of brooms and brushes (GL = 0.01), roses, grafted or not (GL = 0.09), fennel seeds and juniper (GL = 0.18) and vegetable wicker materials (GL = 0.19). Intra-industrial trade characteristics are found in the following products: fruit trees, grafted or not (GL = 0.71), plants for perfumery (GL = 0.62) and alfalfa seeds, which is closer to the middle, i.e. **inter- and intra-industrial trade** (GL = 0.57).

## RCA index of comparative advantage

Products can be classified according to the level of index of comparative advantage. **Products with satisfactory comparative advantage have RCA index values from 0 to 0.50, with significant advantages have RCA index values of 0.50 to 1.00, and with exceptional comparative advantages have RCA values over 1.00. In the foreign trade sectors of coffee, tea, as well as spices and animal and plant raw materials Serbia has no comparative advantages. [2]**

**Commodity group of spices has significant and product group of plant raw materials has no comparative advantages. Also, the comparative advantage of commodity groups decreased in 2008 compared to 2005.**

**The highest value of RCA index, i.e. an exceptional comparative advantage have plant materials for the production of brooms and brushes ($RCA^{2008} = 2.70$), roses, grafted or not ($RCA^{2008} = 1.48$), fennel seeds and juniper ($RCA^{2008} = 1.11$) and plant materials for wickerwork ($RCA^{2008} = 1.08$). Other products have a positive RCA index. The presented results show the presence of comparative advantages in foreign trade, at the level of raw materials.**

Comparative advantage indices of finished products in 2008 have low value. The exception is for products: brooms and brushes of vegetable material. The value of RCA index of fennel seeds and juniper belongs to the category of outstanding comparative advantages, and juniper brandy $RCA^{2008}$ =- 1.03) and essential oils (e.g., juniper $RCA^{2008} = 0.23$) to negative comparative advantages.

Foreign trade of medicinal, spice and aromatic herbs is based on exports of raw materials and export of products at higher stages of processing (extracts of essential oils). According to the data, processing industry is falling behind.

## Conclusion

**The foregoing analysis points to the fact that the economy of the Republic of Serbia in the period between 2005 and 2008 was integrated into international trade flows. Of the ten analyzed products, most belong to raw materials of agricultural origin and a part of it are final products. Raw materials of agricultural origin present comparative advantages.**

Research shows that the analyzed products show a positive export-import ratio. **Grubel-Lloyd index (GL) shows that there is inter-industrial exchange at the product level.** The index of comparative advantage (RCA) shows that there is a decline

in comparative advantage mainly for all products. The index of comparative advantage (RCA) of the final product shows a negative value or very low comparative advantage in some products.

The presented results give the assessment of export potential of the country and assessment of comparative advantages in the future.

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UDK: 332.2.021.8 (470)

# LAND REFORM IN RUSSIA: A CHANCE TO INCREASE EFFECTIVENESS?

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## Abstract

*The Federal Law "About turnover of agricultural land" was adopted in Russia in 2002. Certainly, there was the land market in Russia before this adoption, but it was embryonic, without any legal base. The roots of this situation are in the land reform of 1995-1998s. It was implemented based on the Decrees of the President of Russian Federation that "implanted" the institute of private land property and distributed the land shares between joint-stock companies, owners' partnerships, cooperatives and citizens. This reform formed the unregulated land market in Russian Federation and mess in agricultural land resources that we see now in Russia. The Federal Law "About turnover of agricultural land" adopted with hard debates and unreasonable claims from different groups of deputies to the government created the more predictable situation the market of agricultural land in Russian Federation.*

***Key Words:*** *Landownership, land tenure, land redistribution, effectiveness, land proprietor, land user*

## Introduction

Agricultural production in Russian Federation is the main part of agrarian and industrial complex. It occupies the special place in the whole Russian economic.

The priority national project "Development of agricultural complex" was implemented in Russian Federation since 2006 until 2008. It aimed the revival of agriculture in Russia. The main results of this project showed the significant changes of the current situation in agriculture. 32.2 mln. rubles were spent on the state support of agricultural production annually. This testifies the growth of attractiveness of land resources for entrepreneurs and investors. There are many

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reasons of this situation: from completely uncontrolled growth of money supply to the successful transformations in the sphere of land legislation of Russian Federation. Dealings with land are registered in Russian Federation more and more often, but, due to our estimations, Russian land market still has significant potential, which is not completely discovered by investors.

## Methodology

Structure of the land fund shows the way of land resources tenure. It includes agricultural land (farmed — arable land, orchards, planted and natural grasslands and pastures), forest lands, lands under human settlements, industry and transport, low production and non-production lands.

Structure of the land fund is constantly changing under the influence of two contrary processes. The first one is the struggle of people for expansion of lands, suitable for living and agricultural use (reclamation of derelict lands, melioration, drainage, irrigation, reclamation of seashores). The second is the deterioration of lands, their withdrawal from agricultural turnover because of erosion, deserting, industrial and transport construction, open exploration of natural resources, water logging and salinization.

Second process is going faster. That is why the main problem of global land fund is the degradation of agricultural land and shrinkage of farmed land per capita with growing pressure on them.

## Discussion

According to the report of the Federal Cadastre Agency of Russian Federation, the land area of the country in 2007 was 1709.8 mln. ha, 402,6 mln. ha of them is the agricultural land (23.5%). In total, the area of agricultural land in Russia in 2006 had increased on 992.1 thousand ha. In the structure of this land category the area of agricultural land was equal 195.1 mln. ha, the area of non-agricultural land — 207.5 mln. ha.

According to the Land Codex of Russian Federation, the fund of the land redistribution in the structure of agricultural land was being creating in the regions. The fund includes agricultural land spots free from the property rights of legal bodies and individual persons in purpose of redistribution of these lands for agricultural production, establishment and development of farms, horticulture, olericulture, haymaking and grazing. The area of the redistribution fund increased in 2006 on 3.6 mln. ha (up to 43.5 mln. ha).

The area of agricultural land is formally growing, but in the reality the situation with significant part of these lands, especially related to the bankrupted enterprises, is unclear. It is necessary to make inventory of these lands to establish order on the market.

Agricultural lands were provided for the construction of new industrial enterprises and for the development of already existing ones. The part of these lands was distributed between the forestry enterprises in purposes of forestation. The conservancy organizations also increased their territories with these lands.

The main reason of shortening of agricultural lands used for agricultural

production was the discontinuation of activities of agricultural enterprises and organizations and farms and transfer of quitted lands to the fund of the land redistribution. Because of that the increasing of the area of agricultural land in the fund of the land redistribution was 11.3 mln. ha, including 3.6 mln. ha arable land. The growth of the fund of the land redistribution is the serious problem that requires its solution.

Regarding the forms of the property the agricultural land at the beginning of 2007 were distributed as follows. The majority, 276.5 mln. ha (68.7%) – in state and municipal property; 120.3 mln. ha (29.9%) – property of individual persons; 5.7 mln. ha (1.4%) – property of legal bodies. It is necessary to say that agricultural lands in the property of individual persons and legal bodies – 126.0 mln. ha – is 97.1% all private lands in Russia. 87.4% of them are the land shares in the common land property.

There is the process of changing in structure of property of agricultural lands in the last years. The area of agricultural lands in state and municipal property is growing (on 0.7 mln. ha in 2006). It is related to the general increasing of area of this kind of lands. At the same time the area of lands in individual property is decreasing (on 421.3 thousand ha).
The tendencies of decreasing of area of agricultural lands in the property of individual persons and legal bodies are divergent. They do not promote the economic development of agricultural production.

Despite the impressive successes of formal land market in Russia, the main problems of its development are not solved. The main problem is that the land market in Russia is not managed neither by the government nor by business subjects. The implemented cadastre evaluation of land resources in Russian Federation had not adjusted the process of transfer of property rights and governmental control. The reason of this situation is the selective approach to the cadastre evaluation. It was implemented not in the direction of the creation of the detailed cadastre plans, but in the direction of evaluation of the most valuable land resources of Russian Federation for the purposed of taxation.

The tendencies of the transition of the land resources from one category to another comparing to the dynamic of the last years were very active. The fund of the agricultural land redistribution of Russian Federation increased on 3647 thousand ha (1% of total area of agricultural land of Russian Federation in 2007) because of liquidation of agricultural enterprises in different regions of the country. The tendency of the voluntary abandonment of agricultural enterprises from their land resources prevailed because of the hard economic satiation in Russian agriculture.

The changing of the areas of settlements in the beginning of 2009 took place at the cost of survey of land spots in the existing borders of the settlements and also because of the adjustment of the structure of the settlement lands to the legislation. The total area of municipal settlements on January, 1st, 2009 was 7.8 mln. ha (the total area on rural settlements was 11.3 mln. ha). The agricultural lands in the borders of cities, towns and rural settlements still prevailed in the structure of the settlement lands. Their area was 9.1 mln. ha (47.6% of total area of land of this category). The area of lands under housing and industrial construction was 3.4 mln. ha (or 17.7%).

The tendency of prevailing of agricultural lands in supply is observed during all period of market development. The lands of this category (that can be sold and bought) in Russia occupies 65% of total volume of the land market (which is on 13%

more comparing to the indicators of the last year). However, this situation is probably related not to the sharp growth of land supply, but to the decrease of the market share of other land categories.

The agricultural lands gained the special "popularity" after the adoption of the Federal law "About the transfer of lands from one category to another". Nowadays these objects are actively transferred to the categories of small summer housing ("dacha") or industrial lands in purpose of the following sale. Today 48% of agricultural land market is presented by the land spots for small summer housing. The price of the land spot after transfer to the other category can be increased 2 times and even more.

Even based on the dynamic of these land categories we can conclude that the land resources of Russian Federation have significant potential. Another factor of the high potential is the prevailing state and municipal property on land resources. The structure of the land property as well as the structure of categories is dynamically changing, but there is another reason of this change – the return of land resources of Russian Federation to the state, municipal or private property under legal court resolutions. In future the dynamic of changing of structure of property of land resources will increase with the development of court practice and legislation.

Considering this background we should analyze the problems of the land market of Russian Federation. From the state's point of view, these are the lands in business turnover. In fact, there are many lands in this category, but the total share of these lands in turnover of the land fund of Russian Federation remains minimal.

Analyzing the quantity of dealings with land resources in Russian Federation we can see that the 5-million border of dealing per year is overviewed since 2004. There is even the growing tendency of this indicator. In 2004 there were registered 4385 thousand dealings, but in 2008 this number increased up to 4545 thousand. Lend rent prevails in the total volume (3730 thousand dealings). Sale of state and municipal lands – 176.7 thousand dealings, including auctions – 10.7 thousand.

Areas of sold lands is even less significant. Only 262.7 thousand ha of state and municipal lands of Russian Federation were sold in 2008. The growth was close to 100% – on 171.3 thousand ha comparing to 2007. The most active regions in sale of state and municipal lands were Privolzhsky and South Federal Districts – 60.5% and 18.7% of total area of land dealings correspondingly.

Despite these indicators the Russian land market is still on the stage of its initial creation and development. It is still weak and undeveloped because of the number of economic, legislative and administrative reasons. Only 5% of lands are involved in the annual turnover of agricultural lands. It is obviously insufficient considering the unsatisfactory general condition of Russian agricultural production. This means that the owners of agricultural land (not effective in the majority) will be changed with the current dynamic of turnover only after 20 years.

Low turnover of agricultural lands can be explained by the low attractiveness of this land category for the potential investors. The legal conditions of the land market are not completely formed. This land category is not demanded as the effective element of the market relations.

The problem is that many landowners are not able to maintain and use their property or deviate from this obligation. Almost 1/3 of agricultural land during last 10 years is in the property of landowners like that. According to the data of the Committee of the State Parliament (Duma) on agriculture, 26.6 mln. ha (6.8% of all agricultural land or 22.1% of land in private property) are the unclaimed land shares. Other 6.6 mln. ha (1.7% of agricultural land, 5.5% of land in private property) are in the ownership of people who got the documents for the land in 1996 and never used their land shares.

There are many reasons of this situation: wrong composed lists on privatization of agricultural land, difficulties in registration of reversion of rights on land shares, presence of escheat property, and expensive registration of rights on land.

During registration of dealings with lands their participants usually face the hard administrative, legal and financial difficulties. Agricultural enterprises usually do not have sufficient financial resources for registration the dealings with owners of land shares and spots. It requires the preparation of maps, payments for fieldwork and other expenditures. Registration of rights on land shares is difficult and expensive. The incomes of agricultural producers are not enough to pay the high rent, to buy land shares and spots. But these expenditures can be affordable by the constructional and industrial companies. As a result, only 10% of agricultural land in the property of citizens and legal organizations are registered in accordance with the requirements of legislation and used in the proper way.

## Estimation results

The imperfection of the land legislation, absence of the necessary land financial instruments and modern infrastructure are not only limiting the development of the civilized land market in Russian Federation, but also create the conditions for growing of the "shadow" market. This problem can be solved only on the solid and effective legislative basis.

In purpose of the recovery of the turnover of the agricultural land it is necessary to provide the modern and effective legislative basis, open and public dealings, their state registration, land management and monitoring, including use of the public networks (via Internet) for information about the conditions of the fund of the agricultural land. During 15 years from the beginning of the agrarian reform the structure of agricultural land resources has changed significantly. It is necessary to start works on inventory of real use of land shares. The results of this inventory will provide the clear picture of the volume of land shares in nominal capital or in unit fund of agricultural enterprises leased, unclaimed, condemned or allotted for establishment of farms or development of private agricultural production.

## Conclusions

Summarizing we should say about the great potential of the land market of Russian Federation. For its development it is necessary to solve the question of development of state land policy and establishment of the administrative body for land management. The situation on the

land market will stay the same until the solution of the problems with prevailing of land tenure, averse sale and uncompleted land cadastre. We hope that the new legislation adopted in 2008 will correct the Russian administration to the direction of "market" and "openness". However, the legislation is not enough, the priority development of the land market infrastructure is vitally necessary.

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Economics of agriculture
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UDK: 338.43.01

# A CHAOTIC AGRICULTURE/AGRI-INDUSTRY RATIO GROWTH MODEL

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## Abstract

*Chaos theory , as a set of ideas , attempts to reveal structure in aperiodic, unpredictable dynamic systems. Chaos embodies three important principles: (i) extreme sensitivity to initial conditions; (ii) cause and effect are not proportional; and (iii) nonlinearity.*

*The basic aim of this paper is to provide a relatively simple the agriculture/ agri-industry ratio growth model that is capable of generating stable equilibria, cycles, or chaos depending on parmeter values.*

*A key hypothesis of this work is based on the idea that the coefficient* $\pi = \gamma + 1$ *plays a crucial role in explaining local stability of the agriculture/agri-industry ratio,where* $\gamma$ *is a suitable parameter.*

***Key words:*** *chaos, agriculture, agri-industry, growth, model.*

## Introduction

Input-output analysis, developed by W.W. Leontief, is used to study the relations between economic sectors. Leontief 's concern focused on how economic systems were structured, the way an economic sectors interrelate and mutually influence one another.

Input-output analysis as a basic method of quantitative economics observes various economic sectors as a series of inputs of source materials (or services) and outputs of finished or semi-finished goods (or services).

Commodities (or services) are produced by economic sectors (e.g. the agricultural sector) and they serve as inputs in other sectors in order to produce their final products (or services) also called outputs (e.g. manufacturing industry, agri-industry, turism , trade,…). Intermediate demand refers to inter-industry transactions, i.e. goods and services bought by firms from other firms and used up in current production.

The outputs are delivered to the final demand sector that comprises purchases

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by individuals for consumption, by firms for investment, by government for government purchases , and by foreigners for exports.

Also, firms use primary inputs (factors of production) which are bought from individuals ( wages and salaries as payments for labour services, interests paid on borrowing, rent paid for the use of equipment, building and land, profits paid for the entrepreneurship).

The output of any industry (say, the agricultural sector) is needed as an input in many other industries, or even for that industry itself; therefore the equilibrium level of the observed sector ( say, the agricultural sector) output will depend on the input requirements of all the n industries. In turn, the output of many other industries will enter into the agriculture as inputs. The equilibrium outputs of the other sectors will depend partly upon the input requirements of the observed sector ( say, agriculture).

If the agricultural sector , for example, increased its production by one unit, then exists the following:

i) first round, direct effects on the industries that supply the agricultural sector with inputs; and

ii) secondary round, indirect effects, since these supplier industries themselves require additional inputs for their production, in order to meet the additional demand coming from the agricultural sector production system.

Technical coefficient plays important role if we take into account these effects. Technical (input) coefficient represents the "recipe" for production of the economic sector. The coefficient indicates the linkages between inputs and outputs and identifies the percentage or portion of the total inputs of a sector required to be purchased from another sector. These ratios of inputs to outputs reflects production technologies at a given point in time.

The assumption that production coefficients remained constant for extended periods is not in accordance with the possibility that factors of production, were substituted for one another as their relative prices changed .

The existence of stable technical coefficients within a longer term forecast is tenuous. The dynamics of the technical coefficients (relative input price changes, the appearance of new industries during the projection period, and the effects of technological change,…) require dynamic approach.

This paper's concern focused on the dynamics of the particular technical coefficient, the agriculture/agri-industry ratio. Namely, the output of agriculture is input of agri-industry. It is assumed that the agriculture/agri-industry ratio is separated from an input-output model.

Chaos theory is used to prove that chaotic fluctuations can indeed arise in completely deterministic models. Chaos theory reveals structure in aperiodic, dynamic systems. Chaotic systems exhibit a sensitive dependence on initial conditions: seemingly insignificant changes in the initial conditions produce large differences in outcomes. This is very different from stable dynamic systems in which a small change

in one variable produces a small and easily quantifiable systematic change.

Chaos theory started with Lorenz's (1963) discovery of complex dynamics arising from three nonlinear differential equations leading to turbulence in the weather system. Li and Yorke (1975) discovered that the simple logistic curve can exibit very complex behaviour. Further, May (1976) described chaos in population biology. Chaos theory has been applied in economics by Benhabib and Day (1981,1982), Day (1982, 1983,1997, ), Grandmont (1985), Goodwin (1990), Medio (1993,1996), Medio, A. and Lines, M ( 2004), Lorenz (1993), Shone, R.(1999), Jablanovic (2010), among many others.

The basic aim of this paper is to provide a relatively simple the agriculture/ agri-industry ratio growth model that is capable of generating stable equilibria, cycles, or chaos depending on parmeter values.

## The model

The interdependence between agriculture ( as an input sector) and agri-industry (as an output sector) can be analyzed in formal framework of the chaotic growth model that is highly simplified regarding the economic mechanisms represented, but which is extremely detailed from the dynamical point of view. The ratio (a) of agriculture (A) and agri-industry (I) is

$$a = \frac{A}{I} \tag{1}$$

Let I denotes the agri-industry sector ( the output sector) , and A the agricultural sector (the input sector).

This particular ratio of input (agriculture) to output (agri-industry) reflects the production technology at a given point in time.
Now, it is assumed that this production coefficient is not constant .

We index a by t, i.e., write $a_t$ to refer to the size at time steps t=0,1,2,3,... Now the growth rate is measured by the quantity already given corresponding to the expression:

$$\frac{a_{t+1} - a_t}{a_t} \tag{2}$$

It is postulated that the growth rate at time t should be proportional to 1 - $a_t$ The growth of the agriculture/agri-industry ratio would change according the following equation, after introducing a suitable parameter $\gamma$:

$$\frac{a_{t+1} - a_t}{a_t} = \gamma ( 1 - a_t ) \tag{3}$$

Solving the last equation yields the agriculture/agri-industry ratio growth model, i.e.,

$$a_{t+1} = a_t + \gamma\ a_t\ (1 - a_t) \tag{4}$$

This model given by equation (4) is called the logistic model. For most choices of $\gamma$, there is no explicit solution for (4). Namely, knowing $\gamma$ and measuring $a_0$ would not suffice to predict $a_t$ for any point in time, as was previously possible. This is at the heart of the presence of chaos in deterministic feedback processes. Lorenz (1963) discovered this effect - the lack of predictability in deterministic systems. Sensitive dependence on initial conditions is one of the central ingredients of what is called deterministic chaos.

This kind of difference equation (4) can lead to very interesting dynamic behaviour , such as cycles that repeat themselves every two or more periods, and even chaos, in which there is no apparent regularity in the behaviour of $a_t$. This difference equation (4) will posses a chaotic region. Two properties of the chaotic solution are important : firstly, given a starting point $a_0$ the solution is highly sensitive to variations of the parameter $\gamma$ ; secondly, given the parameter $\gamma$ , the solution is highly sensitive to variations of the initial point $a_0$. In both cases the two solutions are for the first few periods rather close to each other, but later on they behave in a chaotic manner.

## The logistic equation

The logistic map is often cited as an example of how complex, chaotic behaviour can arise from very simple non-linear dynamical equations. The map was popularized in a seminal 1976 paper by the biologist Robert May. The logistic model was originally introduced as a demographic model by Pierre François Verhulst.
It is possible to show that iteration process for the logistic equation:

$$z_{t+1} = \pi z_t (1 - z_t)\ , \quad \pi \in [0,4]\ , \quad z_t \in [0,1] \tag{5}$$

is equivalent to the iteration of growth model (4) when we use the identification:

$$z_t = \frac{\gamma}{\gamma + 1}\ a_t \quad \text{and} \quad \pi = \gamma + 1 \tag{6}$$

Using (6) and (4) we obtain

$$z_{t+1} = \frac{\gamma}{\gamma+1} a_{t+1} = \frac{\gamma}{\gamma+1} [a_t + \gamma a_t (1 - a_t)] =$$

$$= \gamma a_t - \frac{\gamma^2}{\gamma+1} a^2{}_t$$

Using (5) and (6) we obtain

$$z_{t+1} = \pi z_t (1 - z_t) = (\gamma+1) \frac{\gamma}{\gamma+1} a_t (1 - \frac{\gamma}{\gamma+1} a_t)$$

$$= \gamma a_t - \frac{\gamma^2}{\gamma+1} a^2{}_t$$

Thus we have that iterating $a_{t+1} = a_t + \gamma a_t (1 - a_t)$ is really the same as iterating $z_{t+1} = \pi z_t (1 - z_t)$ using $z_t = \frac{\gamma}{\gamma+1} a_t$ and $\pi = \gamma+1$ . It is important because the dynamic properties of the logistic equation (5) have been widely analyzed (Li and Yorke (1975), May (1976)).

It is obtained that :

(i) For parameter values $0 < \pi < 1$ all solutions will converge to $z = 0$;
(ii) For $1 < \pi < 3{,}57$ there exist fixed points the number of which depends on $\pi$;
(iii) For $1 < \pi < 2$ all solutions monotnically increase to $z = (\pi - 1) / \pi$;
(iv) For $2 < \pi < 3$ fluctuations will converge to $z = (\pi - 1) / \pi$;
(v) For $3 < \pi < 4$ all solutions will continously fluctuate;
(vi) For $3{,}57 < \pi < 4$ the solution become "chaotic" which means that there exist totally aperiodic solution or periodic solutions with a very large, complicated period. This means that the path of $z_t$ fluctuates in an apparently random fashion over time, not settling down into any regular pattern whatsoever.

## Conclusion

This paper suggests conclusion for use of the agriculture/agri-industry ratio growth model in analyzing the interdependence of the agricultural and agri-industry sector. The model (4) has to rely on specified parameter $\gamma$ and initial value of the agriculture/agri-industry ratio, $a_0$. But even slight deviations from the values of parameter $\gamma$ and initial value of the agriculture/agri-industry ratio, $a_0$, show the difficulty of predicting a long-term movement of this input coefficient.

A key hypothesis of this work is based on the idea that the coefficient $\pi = \gamma+1$ plays a crucial role in explaining local agriculture/agri-industry ratio stability, where $\gamma$ is the suitable parameter.

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Economics of agriculture
SI – 2
UDK: 663/664:543 (497.11)

# TRACEABILITY OF FOOD PRODUCTS IN SMALL AND MEDIUM ENTERPRISES IN SERBIA

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## Abstract

*There are a multitude of ingredient suppliers, manufacturers, packaging suppliers, distributors, wholesalers, and retailers in value chain of the food industry. At each point in the value chain there is a risk for food poisoning. The main purpose of this paper is to describe how production system"from farm to fork" works in sector of small and medium enterprises in Serbia. Within this paper we compare situation of traceability of food products in big, small and medium enterprises from this sector. Based on the data and analysis, the conclusion was made, that investments in quality of row materials and farmer's education is important for safe food.*

*The analysis is based on the secondary data. Sources of secondary data for this topic are surveys, organizational records and data collected through qualitative research in literature.*

***Key words*:** *Value chain, food saffety, standards, traceability.*

## Introduction

Traditional food control systems, examining of final products, are increasingly less deemed appropriate, so this control system, the so-called „detection inspection", is being replaced by an integrated control form, widely known as „from field to table" or „from farm to fork". It is commonplace that in production processes of food of herbal and animal origin, that is in the process of their industrial treatment, packaging, manipulation, storage, distribution and sale, different sorts of contamination can occur, that is irregularities which for themselves, undoubtedly, carry certain health risks for a person who consumes such a product.

The introduction of the HACCP system in small and medium enterprises

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presents a very significant issue for further growth and development. Specificness we can single out as a feature for small and medium enterprises posing as an obstacle that can hamper establishing of food security management system, and the following and traceability of products or raw material, is especially hampered with small enterprises.

## Product traceability

ISO 22000 states that communicating and traceability in the food chain is essential. Thus all relevant dangers for food security are identified and appropirately managed at every step in the food chain. [6]

To follow the way of food „from field to table" is very difficult with small and medium enterprises in Serbia. Most often this way includes only one part of the „value chain" and that is the one form raw material reception to finished goods sale, one step before (primary agricultural production or semi-product reception) and a step after (transport, wholesales, retail, end user) is out of control of almost all our enterprises. The so-called „integral HACCP" is actually the final goal of providing food security management system. Only this way can we be sure that the end product, that is, what a customer consumes at his table has „properties" of a healthy and safe product.

A company has to introduce quality systems such as HACCP or similar set, but it also has to fulfill other regulations, which gives additional obligations to economy subjects that want to launch their products to specific markets. For example, for the EU market, the products must be controlled by competent national authorities of the member states and have an appropriate certificate. [4] Also, for exporting food into the USA, requirements are very strict when it comes to packaging, that is the outlook of the packaging, labeling the product and its contents. According to the US regulations, a product, among other things, has to be declared in a certain manner and to fulfill additional requirements – product mass needs to be expressed in both measurement systems, the product name needs to be written in both English and Serbian, and nutritional value of each product needs to be presented in a proposed table.

The European Commission put Serbia on the list of countries approved for milk import in April 2008, but the dairies are required to respect high standards of quality and food security. Serbia was given the license to export milk and dairy products into the EU market, as well as to transport these goods through EU countries to other markets, from EU Standing Committee for Food Chain and Animal Health. The basic standards that the dairies must fulfill if they want to export their goods into the EU are constant control of cow health, but milk quality control as well, from milking to end product (from field to table). The fulfillment of these criteria of dairies that enter the process of getting the export license is checked by veterinary inspection, but the EU inspection as well. Thus it is clearly known that the first step is very important, starting from health of animals that provide raw material for further production. Our dairies do not have great control in this part of the production.

## Example of big producers

In order to fulfill the EU requirements, Serbian producers must follow flow of food from raw materials to end product. The following examples show us how big systems do it, where they have the ability due to their size to provide quality raw materials, primarily from their agricultural producers – associates.

Belgrade-based company Imlek has 14,000 suppliers, and it has invested 30 million Euros in development and improvement of production in the last three years.[3] This company is aware of significance of primary production and raw materials quality and thus it has started giving loans to farms, in order to see primary agricultural producers increase milk production and buy necessary equipment. The very product control from field to end user is the end goal of funding by this company. Imlek will feel the benefit from this system not only in preserving the customer base, but in strengthening their associates who will improve their businesses through convenient loans and bind themselves for Imlek long-term. If we oversee a very important aspect, and that is desire of the company to secure itself in increasingly volatile milk market, the other very important element is milk quality.

Sombor dairy, a member of Lactalisgrupe Dukat, has the same goals in acquiring an EU number. If a dairy wants to get an EU number, it needs the whole chain – starting from raw materials, treatment, to end product, to be certified. In order to provide high quality raw materials in the following period, this dairy is planning significant investment in development of primary milk production and starting a modern central laboratory within the factory that will enable meeting strict requirements and regulations. Not having an EU number hampers other exporting activities so today this dairy can not use the potential of the Russian market, because without this number, you are not allowed to transport goods through EU member states. [1]

In the early 2008, first farms are certified for food health security. These are firstly milk producers - associates of Imlek and Subotica dairy.[4] The control of delivered fresh milk starts at the very entrance into the dairy. Key parameters are number of microorganisms and somatic cells. Milk mustn't contain water or antibiotics. Milk quality is also marked, and the best milk has label of extra class. Certificate is issued

3 In Danube Foods group they say that, beside undisputed quality our milk has, exporting into European market takes huge investment in primary milk production. Only in 2007, this company invested 26 million Euros in production, out of which 13.3 million was designated for production alone, 7.2 million for new storage rooms and over 4 million in refrigerators. www.imlek.rs/index.php?page=6&type=clippings

4 According to manager of raw material sector of Imlek, Jerimja Milovanovic, these are the first farms in Serbia with HACCP certificate, and additional 50 farms have conditions for getting the certificate which guarantees food production security in all phases. Farms that have received the certificate: "Tomić" from Stajićevo, "Radin Salaš" from Samoš, "Stanču" from Lokva, "Plamen" from Vršac, "Balan" from Kuštalj, "Gere" from Novi Kneževac, "Kovač" from Male Pijace and "Šečerov" from Srpski Krstur.

every third year, and production conditions on farms will be constantly monitored.

We see that funds of big companies are invested in the system of "small or partial" control of these companies, which is in raw material base. With this investment, big companies provide supply of correct raw materials. Unfortunately, through further distribution, not even big companies like Imlek or their consumers can be sure that integral HACCP is respected, primarily due to lack of certified wholesales and retails. One also needs to pay attention to the fact that there are a small number of restaurants, hotels, canteens or other objects which prepare food and have HACCP system introduced. A tiny step forward was made by Delta, which introduced HACCP in its retail chain in December 2007.

## Problems of small and medium food producers

The above mentioned are warning us not to expect better situation in sector of small and medium enterprises of fruit, vegetables, meat and milk producers. There are a lot of common and individual problems which form such a situation and confirm difficult implementation of the whole system of food security from field to table.

Major issue in Serbia is so-called "production of everything" of agricultural producer.[9] Together with broken-up property and insufficient education of our farmers it is a great obstacle in producing appropriate raw materials which will be certified as a quality product for our processors.

Small and medium dairies in Serbia are supplied with raw milk by a range from few dozen to several thousand agricultural producers who have 3.6 cows on average.[5][2] Such tiny producers have no interest in certifying their farms. Such is the case with refrigerators which buy fruit and vegetables from hundreds of producers. An average area for growing raspberry and increasingly present blackberry in Serbia is less than 30 ares. Knowing that average yield of raspberry per hectare is 15-20 tons and 30-40 tons for blackberry, refrigerator owners have a major job checking a great number of small properties in order to be sure raw materials they buy will fulfill their capacity. Such is the situation with other products because the properties of our producers are very small; up to 80% of fields are property of small producers of up to 5 hectares on average.[7] In order to produce quality raw materials which would be processed to reach tables of discerning Europeans, the producers will have to specialize and perfect one or two products.

As an incentive for producing quality products, the processors stimulate primary agricultural producers with higher purchasing price. For example, purchasing price for raw milk in 2008 was increased by 1 or 2 dinars per liter for top quality. [5][6] For raspberry this

5 In Zlatibor, Raski, Toplicki and Rasinski counties. The poll conducted from 2006 to 2007 by Mercy Corps an NGO implementing CRDA program in these counties.

6 Milk with less than 100,000 bacteria per milliliter, less than 400,000 somatic cells per milliliter, and more than 2.8% of protein is considered first class quality.

prize was even higher; first class raspberry is 50% more expensive than second class.[7]

Beside quality which needs to be met by primary agricultural producers, another problem is quantity which our country can sell in foreign markets. Although at first sight it is not directly bound for following health food security, it is a very important aspect that affects quality. Out of quantity we can choose quality, but if do not have enough quantity in agricultural products, quality is hampered due to lack of competition which stimulates producers to reach better quality. An example of such a problem is export of baby beef into the EU. Back in 2007 we exported only 2,200 tons of baby beef, and we could have exported 8,700 tons, the quantity approved during negotiations for Stabilization and Association Agreement.[3] Of course, the reason is lack of quality cattle fund.

Education is a one of the major problem, domestic producers will have to find out which chemicals they are allowed to use, which fertilizers are forbidden etc. Domestic cattle breeders, vegetable and vineyard producers are expected to follow news in plant breeding and food production. On the contrary, they risk failure in getting certificates necessary for market breakthrough (GLOBALGAP). Certificate houses will require peasants to maintain records of plants they grow, which chemicals and fertilizers they used, what they fed their cattle with etc. There are non-mandatory EU standards, but our producers will apply them in order to withstand competition. The choice before a Serbian peasant will be easy: he will either respect standards, or his goods, facing competition with thousands of others who have passed all the examinations, will fail to find a buyer.

It is a clear market message, but so far seen only by experts and only a few well-informed customers, but not by people living from it. Agriculture must become a serious job to live from, not just some part-time job, or because you have some free space in the field.

A part of our agricultural producer's mentality is to be an individualist, to produce everything and to sell goods of uneven quality. The way out of this situation is associating, where producers jointly sell and buy goods. Those who want to live from agriculture will have to become parts of big associations which will apply the same technology and enter the markets with series of identical, classified goods which they will know to who to sell.

The government has identified this problem and has taken measures as early as 2008, passing a decree to sustain funds for introduction and certification of good agricultural production practice. The intention is to bring as many individual producers as possible into process and make them become producers of healthy products which will be sold directly or as raw materials for further processing. GAP will require producers to keep a record, which is production protocol, for example, when the fruit was sprayed and with which chemicals. Thus we will exactly know the history of strawberries in our ice-cream, and appropriately apply the system "from field to table". Up until then

7 Resarch data from: Association Vilamet Ivanjica, Association of Agronomic Center Priboj and Panici Brus refrigerator.

our small and medium enterprises need to do some work on their purchasing network, education of their partners and suppliers and improvement of their labor conditions.

## Conclusion

A great number of agricultural producers who supply the raw materials to processors produce everything and sell goods of uneven quality. It is necessary to commit oneself to intensive agricultural production in order to produce raw material base of appropriate quality and quantity.

For any integral system of food security management it is necessary to view the whole production flow, from raw material to end user. Small and medium enterprises cannot in these circumstances fulfill this requirement. The way out of this situation is specialization of agricultural producers on one product, association and introduction of GLOBALGAP standard. The government and international donors saw this problem well and as of 2008, they have been subsidizing producers to stimulate them to introduce standards of good agricultural practice GLOBALGAP. The distribution and sales also remain out of control of small and medium enterprises so the destiny of a product beyond the enterprise gates becomes uncertain.

Small and medium enterprises in the future need to work on their purchasing network, education of their partners and suppliers and improvement of their labor conditions.

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Economics of agriculture
SI – 2
UDK: 663.974

# ISOLATION, CHEMICAL AND MICROBIOLOGICAL CHARACTERIZATION OF ESSENTIAL OILS FROM TOBACCO WASTE

*Obrenija Kalamanda*[1]

## Abstract

*For the purpose of this investigation, the isolation, chemical and microbiological characterization of essential oils originate from tobacco waste were performed. The subjected tobacco waste was collected during the primary processing and cigarette making process in Tobacco Factory Banja Luka. In extracted essential oils 26 components where identified, as well in petrol ether extract (26 compounds).*

*The major identified compounds of essential oil are Neophytadiene, Phtalic acid, Palmitic acid, Miristic acid and Epoxy labdenol.*

*The microbiological activity examination was showed significant antibacterial affection of extracted essential oils and petrol ether extract on Escherichia coli, Staphylococcus aureus and Pseudomonas aeruginosa.*

***Key words**: tobacco waste, essential oil, petrol ether extract, antibacterial activity, nicotine, neophytadiene.*

## Introduction

The contemporary approach to industrial production, establishes harsh economy, quality and environmental assignments for the cigarette manufacturers. Therefore, manufacturers find out technological solutions that provide them to good market position by the best possible and environmental friendly row material and energy usage. Consequently, decrease of industrial waste production and maximum exploitation of avoidable refuses, appears to be an imperative of modern industrial production.

Tobacco waste originates manly from processing and manipulation process. It's processing begins by the separation of foreign materials. After the separation,

1 1 Tobacco Factory Banja Luka, Kralja Petra I Karađorđevića 82, Banja Luka, obrenija2009@hotmail.com

refined particles are sifting trough different sieves. That way arises three fractions of tobacco waste.[6]

These kinds of tobacco waste are using in cigarettes manufacturing, for production of reconstituted tobacco and as the row material for obtaining some chemicals (nicotinic acid for example).

Because of its usability in different kinds of industrial productions, essential oil appears to be very interesting row material obtained from tobacco waste.

Survey of accessible literature showed that the essential oil chemical composition of tobacco waste originates from domestic tobacco types was not examined. For that reason, the isolation, chemical and microbiological characterization of essential oil and tobacco extract, sourced from domestic tobacco waste, was the goal of this investigation.

## Experimental

Subjected tobacco waste material was collected in the primary process of Tobacco factory Banja Luka. From collected material was taken average sample. Average sample was stored in darkness, at the room temperature up to further analysis.

The essential oil isolation was carried out by the water steam distillation method.[4] Distillation time was 7 hours.

After the distillation the pH value is adjusted at pH=3-4, by adding of $H_2SO_4$ dilution into a distillate. Extraction of essential oils from distillate was carried out by chloroform. The adding $Na_2SO_4$ dried the chloroform extract. After drying, the chloroform was removed by vacuum distillation. That way taken essential oils where stored at temperature of -18°C, up to GC/MS analysis.

The extraction of tobacco waste was carried out by petrol ether in Soxtlet extractor.[4] The extraction time was 7 hours, while the solvent appears colorless. Obtained extracts where stored under the same conditions as the essential oils.

For qualitative and quantitative content analysis of taken samples compounds, the combination of gas chromatography and mass spectrometry methods was used. It was performed bay using of HEWLETT PACARD 5890 Series II apparatus, incorporating HP5MS (5% phenylmetylsyloxane) middle polar capillary column, 30 m of length and 0.25 mm of diameter with FID detector. The applied film thickness was 0.25 μm.

As the carrier gas was used Helium with 0.8 ml/min of constant flow. The temperature of injector was 250°C with fallowing temperature program:

1. 50°C - 130°C, 20°C/min,
2. 130°C - 280°C, 9°C/min.

Ionization was performed by the electron clashes of 70 eV energy, and all of eluted compounds specters where recorded by HP5971 Mass Selective Detector.

Identification of essential oils and petrol ether extract compounds where carried out by comparison between the recorded specters and specters of known compounds according to MS library WILEY 275.1.

### Analysis of essential oil and petrol ether extract antibacterial activity

For determination of antibacterial activity, the Diffusion Disk method[1] vas used applied at the standard test microorganisms *(Straphylococcus aureus* ATCC 25923, *Escherichia coli* ATCC 25922 i *Pseudomonas aeruginosa* ATCC 27853). Subjected microorganisms, for this part of investigation, where taken from Bacterial Culture Collection TORLAK.

Test microorganisms where seeded at the Mueler-Hinton (TORLAK) substrate. The 50μL of essential oils ethanol solution (concentration – 100 mg of oils/1 ml of solvent) was applied at paper disks (CTX/50) 6 mm of diameter. Simultaneously, 100 mg of petrol ether extract where dissolved in to the 1 mL of petrol ether. After 18 hour of incubation, the inhibition zone diameter of clear growth was measured at the lower side of plate (measuring instrument according to TORLAK). The result is expressed in millimeters.

### Results and Discussion

Content of essential oil in examined tobacco waste samples is 0,011% (w/w). Essential oil, extracted from tobacco waste, is light yellow colored and have sharp and exhaustive odor.

Isolated petrol ether extract of tobacco waste is bright brown colored thick liquid with no clearly defined scent and its yield is 4,83% (w/w).

The composition of tobacco waste essential oil and content of essential oil compounds are revealed in table 1.

*Table 1. - Identified compounds of tobacco wastes essential oil and petrol ether extract*

| | COMPOUND | Essential Oil | | Petrol Ether Extract | |
|---|---|---|---|---|---|
| | | Rt(min) | %* | Rt(min) | %* |
| | Nicotine | 16.60 | 0.53 | 7.93 | 24.06 |
| | Solanone | 16.90 | 2.33 | 8.05 | 0.59 |
| | Geranyl acetone | 18.25 | 0.73 | | |
| | Norsolanadione | 18.82 | 3.52 | 9.66 | 0.26 |
| | Hexadecane | 20.28 | 0.20 | | |
| | Heptadecane | 21.57 | 0.66 | | |
| | 2,6,10,14 -tetramethyl pentadecane | 21.65 | 0.27 | | |
| | Miristil aldehyd | 21.78 | 0.96 | | |
| | Miristic acid | 22.47 | 5.32 | | |
| | Oktadecane | 22.83 | 1.57 | | |
| | 2,6,10,14 -tetramethyl hexadecane | 22.96 | 0.77 | | |
| | Neophytadiene | 23.45 | 19.31 | 13.93 | 8.79 |
| | 6,10,14 -trimethyl-2- pentadecane | 23.52 | 3.95 | | |

| | | | | | |
|---|---|---|---|---|---|
| | Pentadecoic acid | 23.78 | 0.87 | | |
| | Nonadecane | 24.34 | 1.25 | 27.15 | 7.44 |
| | Farnesyl acetone | 24.77 | 3.70 | | |
| | Phtalic acid | 25.69 | 15.99 | 20.98 | 1.08 |
| | Palmitic acid | 25.78 | 8.08 | | |
| | Eicosane | 26.33 | 1.39 | 28.57 | 3.29 |
| | Thunbergol | 27.99 | 2.56 | | |
| | Norambrenolid | 28.64 | 2.75 | | |
| | Heneicosane | 29.01 | 0.88 | | |
| | Epokxylabdenol (I) | 29.32 | 1.51 | 17.83 | 0.26 |
| | Phytol | 29.53 | 1.26 | 16.90 | 0.47 |
| | Epoxylabdenol (II) | 29.69 | 6.29 | | |
| | Epoxylabdenol (III) | 32.17 | 0.57 | | |
| | 3-oxo-α-ionol | | | 11.76 | 0.50 |
| | Glyceryltriacetate | | | 14.31 | 3.00 |
| | Sorbitol | | | 14.64 | 8.50 |
| | Phenmetrazine | | | 16.65 | 0.88 |
| | 8-ethyl-2-methylthioindolizine | | | 17.08 | 0.99 |
| | Neodihydrocarveol | | | 18.33 | 6.99 |
| | O-dimethylaminobenzaldehyde | | | 19.19 | 0.50 |
| | Tetracosane | | | 19.96 | 5.47 |
| | Butyloctylphtalate | | | 20.92 | 0.25 |
| | Di-(2-etylhexyl)phtalate | | | 20.98 | 0.91 |
| | Heptacosane | | | 22.19 | 2.23 |
| | 2,6,10,14,18,22-Tetracosohexaene | | | 23.51 | 0.58 |
| | Nonacosane | | | 24.23 | 2.51 |
| | Oktacosane | | | 25.19 | 2.04 |
| | Hexatriacontane | | | 26.52 | 3.16 |
| | Benzenamyne | | | 28.02 | 2.01 |
| | Triacontane | | | 29.10 | 1.26 |

In essential oil of tobacco waste, 26 compounds were identified. The vital compounds are Neophytadiene (19,31%), from the group of acyclic isoprenoids and Phtalic acid (15,99%). It is distinctive content of three kinds of epoxilabdenole from labdenoides compounds group: Epoxylabdenol (I) (1,51%), Epoxylabdenol (II) (6,29%), Epoxylabdenol (III) (0,57%). Nicotine (0,53%), from the group of alkaloids, Solanone (2,33%) and Nor-solanadione(3,52%) from the group of nor-cembranoides, are also present. From the group of nor-acyclic terpens, Geranyl acetone (0,73%) and Farnesyl acetone (3,70%) where detected as well as the diterpene Phytol (0.51%) and cembranoide Thunbergol (2,56%). Essential oil of tobacco waste also incorporates Norambrenolide (2,75%), Palmitic acid (8,08%), Pentadecanoic acid (0,87%), Miristic acid (5,32%) and mixture of *n*-alcanes (10,94%).

In petrol ether extract, 26 compounds were identified. These compounds are fallowing: Neophytadiene (8,79%), from the group of acyclic isoprenoids, Nicotine (24,06%) from group of alkaloids. High Sorbitol content (8,50%) from the group of polyhydroxyl alcohols and Neodihydrocarveol (6.73%) also were detected as well as the diterpene Phytol (0,47%), Solanone (0,59%) and Norsolanadione (0,26%) from the group of nor-cembranoides. Epoxylabdenol (I) (0,26) from group of labdenoides, certain quantity of aldehyds, *n*-alcanes mixture (20,54%) with Nonadecane (7,44%) as the major representative compound, also were detected as well as the Fenmetrazene (0,88%) and Glyceriltriacetate (3,00%).

Tobacco waste essential oil and petrol ether extract compare to $CO_2$ extract of first class domestic tobacco types[5] (Jaka, Otlja, Prilep), have coincidental chemical composition caused by large number of common compounds.

Tobacco wastes essential oil mainly consists of terpene structure volatile components weakly soluble in water. Petrol ether extract, however, consists of middle and difficult volatile compounds of various structures.

Antibacterial activity of the isolated essential oils and petrol ether extracts was performed by diffusion disk method *in vitro* conditions.

Results of microbiology examination are shown in the Table 2.

*Table 2. Anti Microbial Activity Zone Diameter (mm) Of Essential Oil And Petrol Ether Extract Taken From Tobacco Waste*

| Agens / Bacteria | Eseential Oil (mm) | Petrol Ether Extract (mm) |
|---|---|---|
| *Escherichia coli* | 10,5 | 7,0 |
| *Staphylococcus aureus* | 9,0 | 6,5 |
| *Pseudomonas aeruginosa* | 13,0 | 6,5 |

According to data of Table 2, tobacco wastes essential oil has obvious antibacterial affection to all test bacteria types. The antibacterial affection of essential oil is obviously stronger then the affection of petrol ether extract.

## Conclusion

The qualitative and quantitative composition and anti microbial activity of essential oil and petrol ether extracts where investigated and the conclusions can be reported are fallowing:

1. Quantity of essential oil founded in tobacco waste is 0.011% (w/w);
2. The main components of essential oil isolated from tobacco waste are Neophytadiene (19,31%), Phtalic acid (15,99%), Palmitic acid (8,08%) and Miristic acid (5,32%);
3. Quantity of petrol ether extract founded in tobacco waste is 4,83% (w/w);
4. The main components of essential oil isolated from tobacco waste are Nicotine

(24,06%), Sorbitol (8,50%), Neophytadiene (8,79%), Neodihydrocarveol (6,99%), Nonadecane (7,44%), and Eicosane (3,29%);

5. Common compounds of essential oil and petrol ether extract isolated from tobacco waste are Nicotine, Solanone, Norsolanadione, Neophytadiene, Nonadecane, Phtalic acid, Eicosane, Epoxylabdenol (I) and Phytol;
6. Both, the essential oil and petrol ether extract isolated from tobacco waste, have anti microbial activity related to all examined microorganisms – *Escherichia coli, Staphylococcus aureus* and *Pseudomonas aeruginosa.*

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Economics of agriculture
SI – 2
UDK: 631.16:628.091

# ECONOMIC ASPECTS OF WALNUT SEEDLING PRODUCTION ON A FAMILY FARM

*Branka Kalanović Bulatović[1], Zoran Rajić[2], Bojan Dimitrijević[3]*

## Abstract

*There are profitable conditions for walnut production in Serbia. However, there is a trade gap of this fruit. Recently, a demand for walnut seedlings is in growth. The cause of this is new walnut orchards establihment, but large investments discourage producers.*

*The subject of this paper is the economic analysis of walnut seedling production on a family farm, with the aim at observing the influence of production factor to the economic indexes.*

*Solving problems and tasks set during the research required the use of appropriate methods, including: methods for determining costs, analytical calculations for plant production and methods for determining indicators of economic success of family farms. In addition to these methods was used and the method of comparative analysis.*

*Data on farm production for the years 2006 and 2007 have been used for this paper as well as the results of the former researches as the basis for a detail study of specific problems.*

*On the basis of calculated and analyzed economic indexes, the family farm ran business successfully in both years and managed to have positive financial result, which confirms walnut production profitable, although it has been set on a small area of the family farm.*

***Key words:*** *economic indicators, family farm, production, walnut seedlings.*

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## Introduction

Walnut is one of the most important fruits in the world. Walnut kernel is the first class concentrated food, very rich with fat, albumens, carbohydrates, mineral substances and vitamins (5). Its wide usage in nutrition, medicine, alimentary, wood and leather industry makes it one of the most appreciated fruit crops. Almost all parts of walnut have manifold and wide usage in everyday life. Walnut tree is considered to be very precious material in furniture industry. Its characteristics are great solidity, hardness and plasticity, that is why it is easily treated.

Walnut is widely spread (6). The most important regions for walnut growth in Serbia are Timok, Podrinje, Zapadna Morava, Juzna Morava, Metohija, Fruska gora, etc. Mostly it is produced in individual holdings. As a result of that, smaller part of production is current, while major part is spent within household.

There are profitable conditions for walnut production in Serbia; however there is a trade gap of this fruit. Walnut import is greater than its production. Recently, a demand for walnut seedlings is in growth, the cause of this is new walnut orchards establihment. Great number of producers are interested in walnut production, but large investments are discouraging (3).

## The subject and the aim of the paper

The subject of this paper is the economic analysis of walnut seedling production on a family farm, with the aim at observing the influence of production factor to the economic indexes.

Economic analysis shows negative factors which contribute lower extent and production quality.

## Research methods and data sources

Solving problems and tasks set during the research required the use of appropriate methods, including: methods for determining costs, analytical calculations for plant production and methods for determining indicators of economic success of family farms (1). In addition to these methods was used and the method of comparative analysis.

Data on farm production for the years 2006 and 2007 have been used for this paper. However, these data have not been enough for the complete explanation of some problems and manifestations that is why the results of the former researches have been used as well, as the basis for a detail study of specific problems.

## Research results

### *Number of produced seedlings on a family farm*

Numerous factors influence the number of produced walnut seedlings: natural conditions, seed quality, grafter's skill, graft quality and application of agricultural

engineering methods and measures (2).

Sorts of walnut seedlings produced on the farm are Sejnovo, Geisenheim 139, Rasna, Sampion and Kasni grozdasti which were grafted on the rootstock Juglans Regia L.

In table 1 there is a review of seedling production according to classes, for the years 2006 and 2007.

*Table 1. Walnut seedling production according to class for the years 2006 and 2007 (pieces)*

| Seedlings class | 2006 | 2007 |
|---|---|---|
| **I** | 1310 | 1240 |
| **II** | 610 | 560 |
| **III** | 95 | 90 |
| **Total** | 2015 | 1890 |

Conclusion can be made from the previous table, that the number of extracted seedlings in the year 2007, compared to the previous year, was less for 6.2%. The reason for that were extremely high temperatures during summer months which devastated a number of seedlings.

I n table 2 there is a review of the total number of obtained rootstocks, taken grafts and extracted seedlings compared to the number of sown seeds.

*Table 2. The number of obtained rootstocks, successful grafts and extracted grafted seedlings in 2006 and 2007 (pieces)*

| Year | No. of rootstock seedlings | No. of obtained rootstocks | No. of successful grafts | No. of extracted grafted seedlings |
|---|---|---|---|---|
| 2006 | 3000 | 2840 | 2530 | 2015 |
| 2007 | 3000 | 2810 | 2490 | 1890 |

Almost all technology in walnut seedling production was applied on the observed farm, except for the anti-hail protection network. That considers applying all the necessary agricultural engineering measures like irrigation, applying necessary chemical substances, reinforced nutrition with manures and fertilizers, providing temperature conditions for keeping flails and engrafts, cording seedlings, milling and hoeing up. Reduced technology do not consider most of these operations, which leads to the reduced number of obtained rootstocks, percentages of taken grafts and the number of obtained seedlings. This way obtained seedlings are usually of lower quality, with lower presence of the I class seedlings for more than 50% and by that profit from their production is considerably less. Total number of seedlings would be less for more than 25%.

*Table 3. Expected number of seedlings and revenue when applying various technologies (pieces)*

| Seedlings class | The number of seedlings (pieces) | | Price (€) | Revenue (€) | |
|---|---|---|---|---|---|
| | reduced technology | complete technology | | reduced technology | complete technology |
| **I** | 685 | 1370 | 10 | 6850 | 13700 |
| **II** | 570 | 610 | 6,25 | 3562,5 | 3812,5 |
| **III** | 185 | 45 | 2,5 | 462,5 | 125 |
| **Total** | 1440 | 2025 | 0 | 10875 | 17637,5 |

*1 € = 80 RSD*

In table 3 there is a review of profit which is expected in normal production conditions when applying various technologies (reduced and complete), and in table 4 there is a comparison of profit when applying these two technologies.

*Table 4. Comparison of revenue and expenses when applying different technologies (€)*

| | Reduced technology | Complete technology |
|---|---|---|
| Revenue | 10875 | 17637,5 |
| Expenses | 5893,75 | 9325 |
| Profit | 4981,25 | 8312,5 |

*1 € = 80 RSD*

## *Economic analysis of walnut seedlings production*

Economic analysis of walnut seedling production has been done on the basis of accounting calculation for the years 2006 and 2007. To do this kind of analysis, calculations (table 5), by which value of production on the farm is compared with expenses of production, has been made, as well as achieved financial results.

*Table 5. Costs calculation for 2006 and 2007 (€)*

| No | Type of costs | 2006. | 2007. |
|---|---|---|---|
| 1. | Fertilizers | 107,77 | 120,85 |
| 2. | Pesticides | 82,48 | 96,73 |
| 3. | Electricity | 472,25 | 608,17 |
| 4. | Water consumed | 25,17 | 36,17 |
| 5. | Cost filings | 120,41 | 150,75 |
| 6. | The foundation seed costs | 60,20 | 100,50 |
| 7. | Postal costs | 161,35 | 192,71 |
| 8. | Fuel and lubricants | 51,78 | 67,84 |
| 9. | Food costs of workers | 838,05 | 1020,10 |
| 10. | Seasonal work | 1561,11 | 1785,18 |
| 11. | Review of seedlings costs | 144,49 | 188,44 |

| | | | |
|---|---|---|---|
| 12. | Declarations and labels | 50,57 | 62,81 |
| 13. | Insurance premium | 1023,48 | 1105,53 |
| 14. | Payment contribution to farm owners | 1733,90 | 1809,05 |
| 15. | Costs of packaging | 0,00 | 100,50 |
| 16. | Maintenance | 97,53 | 402,01 |
| 17. | Service of rototilling and plowing | 108,37 | 115,89 |
| 18. | Office supplies | 50,57 | 16,33 |
| 19. | Small inventory | 14,45 | 0,00 |
| 20. | Depreciation | 655,03 | 683,42 |
| 21. | Property tax | 14,81 | 15,28 |
| **I** | **Total costs** | 7373,75 | 8678,27 |
| **II** | **Total revenue** | 12995,18 | 13909,55 |
| **III** | **Profit (II – I)** | 5621,43 | 5231,28 |

*National Bank of Serbia: 07.09.2006. 1 € = 83,05 RSD, 07.09.2007. 1 € = 79,6 RSD*

## *Production value analysis*

Production value represents produced scope of the production and selling price per product unit. According to the seedling classes, gained income from selling is presented in table 6.

*Table 6. Gained value of walnut seedlings production for the year 2006*

| Seedlings class | The number of seedlings (pieces) | Selling price (€) | Revenue (€) |
|---|---|---|---|
| **I** | 1310 | 7,83 | 10252,86 |
| **II** | 610 | 4,21 | 2570,74 |
| **III** | 95 | 1,81 | 171,58 |
| **Total** | 2015 | - | 12995,18 |

*National Bank of Serbia: 07.09.2006. 1 € = 83,05 RSD*

On the observed farm for the year 2006, gained value from walnut seedling production was the amount of 12,995 € or 6.42 € per seedling.

Expected production value in the year 2006 was larger than gained, despite the fact that larger number of seedlings was produced than it was expected. This was influenced by considerably lower gained prices of sold seedlings than those formulated according to grouping, which were up to 12.04 € and the prices expected on the farm. Lower gained seedling price on the farm was in fact the reason caused by selling seedlings in larger amounts to one or two buyers. The advantage of that was lower number of unsold seedlings.

Gained production value for the year 2007 was in amount of 13,909.55 €, that was 7.36 €/seedling. This was more for 2.59% of production than the previous year. Gained production value in the year 2007 made 79.75% from planned amount of 16,865.58 €.

*Table 7. Gained walnut seedling production value in the year 2007*

| Seedlings class | No. of seedlings (pieces) | Sale price (€) | Revenue (€) |
|---|---|---|---|
| I | 1240 | 8,79 | 10914,57 |
| II | 560 | 5,03 | 2814,07 |
| III | 90 | 2,01 | 180,90 |
| Total | 1890 | - | 13909,55 |

*National Bank of Serbia: 07.09.2007. 1 € = 79,6 RSD*

In the year 2007 it was gained larger production value than in the previous year, because of higher production price gained, although it was produced less seedlings. Lower prices were also gained this year, than those formulated according to grouping (15.07 € for the first class). The number of produced seedlings of all classes was reduced in the year 2007 than in the year 2006 for 6.2%. The mostly reduced was the number of produced first class seedlings – for 70.

Total gained production was lower than expected for about 100 seedlings, where the highest exception was for II class seedlings (13.85%), while there was growth in production of III class seedlings for 80%.

## *Analysis of production costs*

The aim of this analysis is to establish dominant expenses in order to examine possibilities of their reduction, then a specific group of expenses exception during one year from a round of years, and in general the possibility of reducing total amount of expenses for the purpose of improving total financial result (Table 8).

*Table 8. Walnut seedling production costs for the year 2006 and 2007 (€)*

| Costs elements | 2006 | % | 2007 | % |
|---|---|---|---|---|
| **I Material costs** | 512,82 | **6,95** | 736,17 | **8,48** |
| 1. Mineral fertilizers | 107,77 | 1,46 | 120,85 | 1,39 |
| 2. Pesticides | 82,48 | 1,12 | 96,73 | 1,11 |
| 3. Consumed water | 25,17 | 0,34 | 36,17 | 0,42 |
| 4. Packages | 0,00 | 0,00 | 100,50 | 1,16 |
| 5. Fuel and lubricants | 51,78 | 0,70 | 67,84 | 0,78 |
| 6. Small inventory | 14,45 | 0,20 | 0,00 | 0,00 |
| 7. Declarations and labels | 50,57 | 0,69 | 62,81 | 0,72 |
| 8. Costs of seeds for rootstocks | 60,20 | 0,82 | 100,50 | 1,16 |
| 9. Cost filings | 120,41 | 1,63 | 150,75 | 1,74 |
| **II Cost personal services** | 205,90 | **2,79** | 517,90 | **5,97** |
| 10. Maintenance | 97,53 | 1,32 | 402,01 | 4,63 |
| 11. Service of rototilling and plowing | 108,37 | 1,47 | 115,89 | 1,34 |
| **III Labor costs** | 4133,05 | **56,05** | 4614,32 | **53,17** |
| 12. Temporary work force | 1561,11 | 21,17 | 1785,18 | 20,57 |
| 13. Nutrition of workers | 838,05 | 11,37 | 1020,10 | 11,75 |

| | | | | |
|---|---|---|---|---|
| 14. Payment of contributions | 1733,90 | 23,51 | 1809,05 | 20,85 |
| **IV General expenses** | 684,17 | **9,28** | 817,21 | **9,42** |
| 15 Office Supplies | 50,57 | 0,69 | 16,33 | 0,19 |
| 16 Electricity | 472,25 | 6,40 | 608,17 | 7,01 |
| 17 PTT | 161,35 | 2,19 | 192,71 | 2,22 |
| **V Intangible costs** | 159,30 | **2,16** | 203,72 | **2,40** |
| 18. Property taxes | 14,81 | 0,20 | 15,28 | 0,18 |
| 19. Seedlings control | 144,49 | 2,00 | 188,44 | 2,17 |
| **VI Depreciation** | 655,03 | **8,88** | 683,42 | **7,88** |
| **VII Insurance premium** | 1023,48 | **13,88** | 1105,53 | **12,74** |
| **IX Total costs** | 7373,75 | **100** | 8678,27 | **100** |

*National Bank of Serbia: 07.09.2006. 1 € = 83,05 RSD, 07.09.2007. 1 € = 79,6 RSD*

The amount of expenses is significant for producers manifoldly. Reduction of expenses enables business result growth, reduction of product price, and by that, growth of its competitive ability on market. According to expenses, producers make business decisions.

From the previous table we can notice that the major part of gained expenses in the year 2006 make working expenses (56.05%) of which periodical workers and their feeding even 32.54%. Expenses for walnut seedling insurance took great part (13.88%), then general expenses with 9.28% of which electricity took majority with 6.4%.

Replacement cost expenses took majority of 8.88% as well. There needs to be mentioned that unlike several years lasting plants, which represent basic mean, for which replacement cost expenses are being kept balancing accounts, plants which give products once at the end of one year or several year lasting period are not considered as basic mean, ( i.e. seed-plots of fruit seedlings, seed-plots of ornamental trees and brushwood, etc.), that is why they do not have replacement cost expenses. Since the equipment used for production had already been amortized (milling machine, pump, etc.) we only amortized the construction.

Expenses for material in total amount of expenses were 6.95%. Among these expenses, dominant were expenses for mineral manures, fertilizers and means for protection, although their amount in total expenses was low, only 2.58%.

Likewise, for the year 2007, dominant were working expenses with 53.17% of which 33.05% went on daily allowances and periodical workers' feeding. The cause of this was growth in food expenses in the year 2007.

Afterwards, there were insurance expenses with 12.74%, then general expenses of 9.42%. One of the causes was electricity price growth in the year 2007.

There was a growth of expenses of materials, mostly because of the growth of water spending, which was caused by high temperatures and long lasting drought, the reason why seedlings were abundantly irrigated.

There was also high exception at self service expenses, caused by damage on milling machine and reparation of equipment for temperature regulation.

Examination expenses were also increased by the republic inspectors.

From the previously given facts, we can notice that all expenses in the year 2007 were increased (except for the replacement cost), and mostly working and self service expenses.

## *Financial result analysis*

Insight into the farm progress in gaining financial result can be made by time comparison to economic business indexes (4) (Table 9).

*Table 9. Financial result analysis of walnut seedling production (€)*

| Year | 2006 | 2007 |
|---|---|---|
| 1. Revenue | 12995,18 | 13909,55 |
| 2. Expenses | 7373,75 | 8678,27 |
| 3. Net income | 5621,43 | 5231,28 |
| Net income per seedling | 2,79 | 2,77 |

*National Bank of Serbia: 07.09.2006. 1 € = 83,05 RSD, 07.09.2007. 1 € = 79,6 RSD*

Financial result per seedling in both years was positive, but with the reduction of 0.14 € or 4.9% in the year 2007 in relation to the year 2006, while total financial result was reduced for 633.79 € or 10.8%. In the year 2007 production value grew up for 2.59% as well as production expenses for 12.8% in relation to the previous year 2006.

## *Business indexes analysis*

Business index analysis has been done with the aim of comparison between the observed farm and other economy entities, regardless of their extent and production capacity structure.

Analyzed economic business indexes on the farm are: efficiency, production profitability, productivity.

Gained economical production level on the farm has been calculated as the relation between market value and total production expenses, which was 1.76 for the year 2006 and 1.6 for the year 2007.

From the gained economical production coefficients it is evident that the production in both years was economical, although it was gained lower economy in the year 2007.

Gained production profitability rate on the farm is shown as the relation between gained and market production value and amounts to 43.26% for the year 2006, and 37.61% for the year 2007.

Gained working productivity on the farm has been calculated out of relation between gained and spent working hours and amounts to 11.64 €/h for the year 2006, and 10.83 €/h for the year 2007.

In the year 2006, it was gained 11.64 € per every spent working hour of a worker, and 10.83 € for the year 2007.

Besides this gained productivity reduction in the year 2007 in relation to the year 2006 its values were considerably high, which implied good working organization and skillful workers for work performing.

## Conclusion

On the basis of calculated and analyzed economic indexes on the observed farm it has been concluded that it ran successful business in both observed years and gained positive financial result, which also has confirmed profitability of walnut seedling production, although it has been set on a small area of the family farm.

Total amount of expenses was increased for 12.8% and total production value for 2.59% in the year 2007 in relation to 2006. It was also gained lower financial result of 10.8%, while financial result per seedling was reduced for 4.9%.

Gained economical production coefficient of 1.76% for the year 2006 and 1.6 for the year 2007 is the proof that the production on the farm is economical.

Gained profitability level is quite good and it was 43.26% in 2006 and 37.61% out of market production value in 2007.

Gained working productivity on the farm amounted to 11.64 € per hour of spent work in the year 2006 and 10.83 € per hour of spent work in the year 2007.

The farm plans to make supply in next period as well as installation of anti-hail equipment (metal construction, network). This will call for extra expenses, but at the same time the farm will be free from high expenses for weather disaster insurance prize.

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Economics of agriculture
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UDK: 631.155.28

# SOME CONSIDERATIONS REGARDING WEATHER AND NATURAL DISASTERS RISK MANAGEMENT IN AGRICULTURE SECTOR

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## Abstract

*The literature offers multiple examples regarding the failure of traditional insurance schemes to provide affordable and comprehensible crop insurance (Vedenov, Barnett, 2004). For this reason, in that paper, we have analyzed the development of new financial instruments that permit the securitization of weather and catastrophe risk and erase the limitations of traditional insurance products. The weather derivatives and cat-linked securities are new instruments that determine the transfer of weather and natural disasters risk to a country to international capital market. The interest of individual and institutional investors for these securities is high because of the low correlation with other financial instruments. The development of weather risk market is important for farmers and companies from developing countries but also for investors from developed countries that can diversificate their portfolios.*
***Key words**: weather, natural disaster, agriculture, risk, management*

## Introduction

The participants on the agricultural markets can face multiple risks like price risk, weather risk, natural disasters risk etc. The price risk may be hedged in different ways through specific clauses of the commercial contract or through financial strategies based on futures and options contract traded on stock and commodity exchanges. The offer of exchanges is large and many agricultural products are traded on spot and derivatives markets. In fact, the first commodity traded on exchanges was an agricultural product – the grain at Chicago Boar of Trade in 1865. The characteristics of agricultural products have made its suitable commodities listed on exchanges. So,

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commodities like coffee, cotton, rubber, cocoa, potatoes, palm oil, soybeans, frozen orange juice, meat, maize and wheat are traded on exchanges like Chicago Mercantile Exchange and Euronext. In fact, the agricultural products no do not use directly the derivative contracts in order to hedge the price risk because they do not have the entire expertise to trade, administrate and monitor these hedging strategies. For this reason, in many countries, there are established public or private institutions that offer support services for agricultural commercialization (for example, in Mexico, a cotton price support scheme is available through a public institution).

In addition, in some countries, the public authorities are highly implicated in order to hedge the losses registered by farmers by weather and catastrophe events. For example, according with information provided by the World Bank, in Morocco, a government sponsored-agricultural insurance program was launched in 1995 because this country must cope with the climate change and in India, weather index insurance programs are available.

## The weather and natural disaster risk management and international institutions

The dramatic climate change and natural disasters cause important human and economic losses. According with ***Annual Disaster Statistical Review 2008*** published by Centre for Research on the Epidemiology of Disasters (CRED), the figures for the year 2008 are:

- 354 natural disasters were recorded;
- over 235000 people were killed ,
- 214 million of people were affected and
- the economic cost was over $ 190 bln (CRED, 2008).

In the year 2008, the most important events were: the earthquake and severe winter conditions in China, droughts in Asia, Africa and severe weather conditions in USA.

The natural disasters recorded in the last years demonstrated the key role of public authorities in disaster risk reduction and recovery and reconstruction operations. For this reason, the World Bank has launched new risk financing instrument named *Development Policy Loan (DPL) with a Deferred Drawdown Option for Catastrophe risks (Cat DDO)*. This instrument is a „financial bridge" that can be use to manage natural disasters until other financial sources are available for public authorities. Some countries like Costa Rica and Columbia have already obtain loans in order to support their Disaster Risk Management Program.

The weather and natural disasters risk management in agriculture sector is very important because many developing countries depend to a large extend on agriculture products for exports and public revenue (Larson, Varangis, Yabuki 1998). So, in many cases, the revenue of the public authorities are very sensitive to the movements of agricultural products prices - Madagascar, Ethiopia and Uganda (coffee), Burkina Faso, Mali and Sudan (cotton), Cote d'Ivoire and Ghana (cocoa), and Guyana (sugar).

In addition, the government is concerned with food security and natural disasters and dramatic climate change can cause important losses in economy and can affect the national security. The climate change determines new challenges: the predictability of weather will be reduce, the frequency and the intensity of severe weather events like hurricane, cyclones, floods, *droughts will increase. (FAO, 2009)*

„Developing countries, and particularly the poorest people in these countries, are the most vulnerable to the adverse impacts of climate variability and ongoing and projected climate change. Their economies depend heavily on climate-sensitive sectors such as agriculture, forestry, fisheries, a reliable water supply, and other natural resources. They are generally hindered by limited human capacity and limited access to technology and capital to invest in risk reduction… Thus it is imperative that climate change adaptation is not separated from other priorities but is integrated into development planning, programs and projects." (World Bank, 2008).

At international level, there are available programs for weather risk management designed by different institutions like the World Bank. These weather risk management contracts are tailored to the country's needs, taking in account some variables like: the type of weather risk, the probability to occur, the estimated loss determined by the event, the level of protection. These programs are available only for low and middle income countries and the World Bank act as an intermediary that has the expertise in transacting derivatives to hedge the weather risk in different sector like tourism, agriculture or energy production. In fact, these programs have two aims: to hedge the weather risk and to build the national capacity for future transactions between private companies or public authorities and financial institutions from international market.

The weather risk management instruments are financial contracts that paid compensations to an entity that is affected by the volatility of weather in exchange of for a premium paid at the conclusion of the contract. The "undying asset" of these contracts is a weather index based on variables like temperature, rainfall, snowfall, wind etc.

In 2008, the World Bank has signed the first contract of weather risk management with public authorities from Malawi in order to offer financial support for fight against the impact of severe drought. In Malawi, the effects of drought are dramatic not only for farmers and rural population but also for public authorities because the cut of farmers' incomes determine the decrease of taxes paid to government's budget. So, the interest of public authorities for the problem of drought has many determinants: social, financial and political. "*We see the Malawi contract as a natural complement to our work to help countries access market-based tools for managing a range of risks, including interest rate, currency, commodity and weather-related risks*," said Gloria Grandolini, Director of the World Bank Treasury's Banking and Debt Management Department (WB, 2008).

The contract is designed as a *put option on a rainfall index.* Because in Malawi, the main source of food, for an important part of population, is the maize, this rainfall index was created in such way to link rainfall and maize production. If the maize production falls to 10% bellow of the historical average, Malawi will receive a maximum payment of $ 5 mil from the risk taker – the insurance company Swiss Re.

This transactions is very important because was the first weather risk hedging transaction signed by the World Bank and in Malawi, the drought risk has dramatic implications (almost 90% of the population lives in rural areas and the weight of agriculture in GDP is around 40%). This transaction was assisted by other institutions like the UK Department of International Development that provide financial support for Malawi in order to pay the premium for the option contract.

So, the public authorities are responsible for the design and promotion of disasters risk reduction policy, but they are sustained international organizations. Besides the World Bank, we remark the support offer by World Food Program of the United Nation in order to strength the governments' capacity in disaster preparedness and response. (WFP, 2009). The WFP`s risk reduction work is done because the climate change affect the food system from the developing countries and the frequency of these natural disaster is increasing due to the climate change.

## The weather derivatives – new products of OTC markets or exchanges

The weather is a key factor that has multiple consequences on national and international economy. For this reason, on the OTC market, since 1996, companies from weather sensitive fields sign contracts in order to hedge the weather risk. The interest of companies from agriculture, constructions, utilities, tourism or retail for weather risk hedging strategies determine the exchanges to launch weather derivatives and in this way we assist to the securitisation of weather risk (OCDE, 2009).

Chicago Mercantile Exchange, the world's largest and most diverse financial exchange, launches the weather exchange traded derivatives in 1999. Now, there are available many derivatives contracts based on weather conditions like temperature, snowfall and frost in more than 47 locations from USA, Europe, Asia, Australia and Canada. All these weather derivatives contracts have as underlying asset an index of temperature or snowfall or rainfall; and the indexes are widely available and objectively measured. The most traded type of contracts is temperature-based contract.

The weather derivatives have been designed and mainly developed in USA for energy companies in order to hedge the climate risk. In present, these derivatives are in competition with traditional insurance policies (the policies that insurance a crop against one or multiple weather risk and the policies that insure the firm` agricultural production against multiple risks – MPCI). The traditional insurance policies have some drawbacks taking in account the following considerations:

- the farmer must demonstrate there is an insurable interest associated with an physical asset or business;
- the multi-peril policies cover a standardized package of risks and a farmer could be interested only in some specific risks;
- the estimation of the loss is not objective because it is done by the insurance company;
- the valuation of the loss generates the increase of the insurance management cost;
- the insurance policies rarely cover the temperature risk (Zara, 2007).

For these reasons, the interest of farmers for weather derivatives has increased. In addition, the payment of weather derivatives depend the evolution of the weather index that is calculated using meteorological data and it is not estimated by the company that must pay the damages.

## Catastrophe linked securities

Catastrophe linked securities (CAT linked securities) are financial instruments used to transfer the catastrophe risk to capital market, so, through these instrument, the catastrophe risk is securitized.

The development of this market was sinuous. The first cat-linked securities are considered to be catastrophe futures and options contracts launched by the Chicago Board of Trade in 1992. These contracts had as underlying asset an index provided by the Insurance Service Office. That index" is the dollar loss on $25,000 of catastrophe premiums from a representative national pool of catastrophe policies". The market of these derivatives had no liquidity and the interest of investors and hedgers was low, so these contracts were traded for a small period of time.

Another important instrument use to hedge the catastrophe risk is catastrophe or cat bonds. Insurance companies use these securities as an alternative to traditional catastrophe reinsurance. The firs transaction wit cat bonds take place in the mid 1990s and the marker developed because the investors are very interested to buy these securities` return that has low correlation with other financial instruments. The figures published demonstrated this fact: in 2009, there were 18 issues of cat bonds and the risk capital raised was $3.4bn, and a 25% increased being registered from 2008.

In 2006, the Chicago Mercantile Exchange decided to launch hurricane futures and options based on the Carvill Hurricane Index (CHI). The Carvill Company that is an important independent reinsurance intermediary calculates this index. This index is calculated on the base of some parameter of hurricanes (velocity and size of the official storm) Using publicly available data from the National Hurricane Center of the National Weather Service.

## Conclusions

The risk management instruments presented in these papers can be used by companies and authorities from developed and developing countries in order to reduce the economic vulnerability to weather events and natural disaster. The problem of economic vulnerability is much more important for developing countries taking in account the following considerations:

- many developing countries rely on agriculture and agriculture depends heavily on weather conditions and natural factors;
- in some cases, a country can be "identified" by a single agriculture product, so the weather and natural disasters risk affects strongly the micro and macro economic indicators;

- the weather events and natural disasters affect manly the developing countries because these countries are located in high risk regions (Asia, Africa and Latin America); because of that, according with some specialist (Varangis, Skees, Barnett, 2002), the losses determined by natural disaster are 20% greater than in developed countries, as portion of GDP;
- the weather can not be controlled, so weather and natural disasters risk management is very important for developing countries taking in account the relation between weather events/natural disasters and poverty;
- in these counties, there are no government-subsidized agriculture insurance programs.

According with these considerations, we can observe that these developing countries, that are highly dependent on agriculture and highly sensitive to weather and natural disasters risk, are growth markets for weather risk instruments. Through the weather risk markets, the systemic risk could be transferred outside of the local area. In this way, new beneficial partnership is set up between the developing countries and individual and institutional investors from developed countries. The interest of these investors for weather risk instruments is high because these financial products are largely uncorrelated with other securities.

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Economics of agriculture
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UDK: 634.8 (497.11)

# PERSPECTIVES AND FASCILITES IN DEVELOPMENT OF VITICULTURE IN SERBIA

*Božidar Mihajlović[1], Branislava Sivčev[2], Daliborka Petrović[3],Zorica Ranković Vasić[4]*

## Abstract

*This "Bahus beverage" represents the most marketed product among all those which are preferred to be labeled as ecologic. Therefore, Zenobije, the Athenian, (sixth century before Christ), the best expert of wine soul, made a famous statement - En oino eleteia- which was later translated by the Romans into- In vino veritas- which we then literally embedded it in our everyday life-**Truth is in the wine**. So, the wine has no definition. All those experiences, which had been gathered during many millenniums and passed from generation to generation through myths and legends, enable the human beings to enjoy in many different pleasures. They also raise the wine to the level of divine drink, assigning even new meanings to it- victory of life and prudence of senses.*

*So, considering the geographical and climatic position of the country, Serbia has all necessary conditions for solid growing table and wine varieties and wine production. Precisely because of these conditions, thise products get their medical recognition, which means that for example wine, as cultural taste of modern human being, can be in function of preserving and preventing the humane health. And this is the main factor, which can bring million foreign in come to the country and employ 250 to 300 thousand people. It is even desirable to create small and medium enterprises, or business inside the family household with all preconditions, which this kind of activity demands.*

***Key words**, natural beverage wine, export product, development*

## Grape and wine production issues in the world and in the European Union

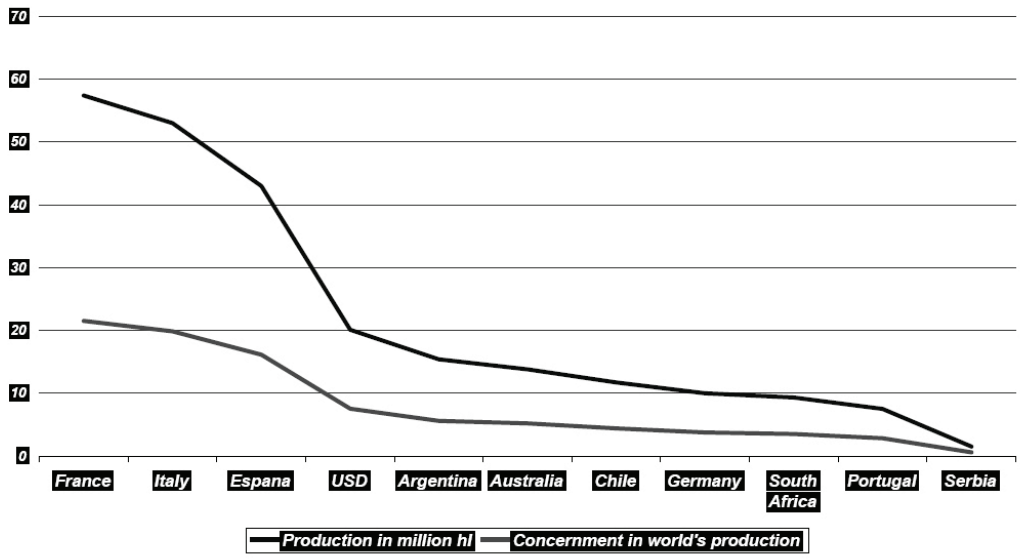
World-wide wine production in the Old World is on the decrease. This matter is due to the depleted wine consumption in traditional consumer countries, clearing of outdated vineyards without their recovery and establishment of the new ones, as well

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as exapansion of high-quality wine from the New World. Accordng to the data from the International Organization of Vine and Wine (OIV), 266.7 million hectorlitres of wine were produced in the world during 2007, which is by 6.9% less than in 2006. Wine consumption has remained unaltered, that is 240.6 million hectolitres. About 7,889 million hectares of vineyrds were used for wine production, which was less in comparison with 7,908 million hectares in 2006. The greatest drop in production was recorded in the European Union. They even reched the point when they included financial support for the producers who decided to clear their own vineyards. Thus they eliminated the side effect of surplus wine and, while at the same time, they aslo encouraged firm preference for the producers who were to stay within the vineyard and wine sector, and that through new regulations and stipulations.

Great breakthrough of the offer of wine from South America, South Africa and Australia to the world market was recorded during the last decade of the millenium. Between the years 1999 and 2004, China almost tripled the surface covered in vine, while in th year 2005, 20000 hectares of noble vine were planted there, which has grown up to 491,000 hectares since then. Australia has done the same, and now it has its own vineyard potential on 164,000 hectares. On the other hand, vineyard ares in France decrease, but not as rapidly as predicted. Decrease in the vine areas in EU has been alleviated through timely implementation of economic measures and passing new stipulations.

**Fig. 1 Wine production in lieder country in the year 2008**




*Source: OIV and the Chamber of Commerce of the Republic of Serbia*

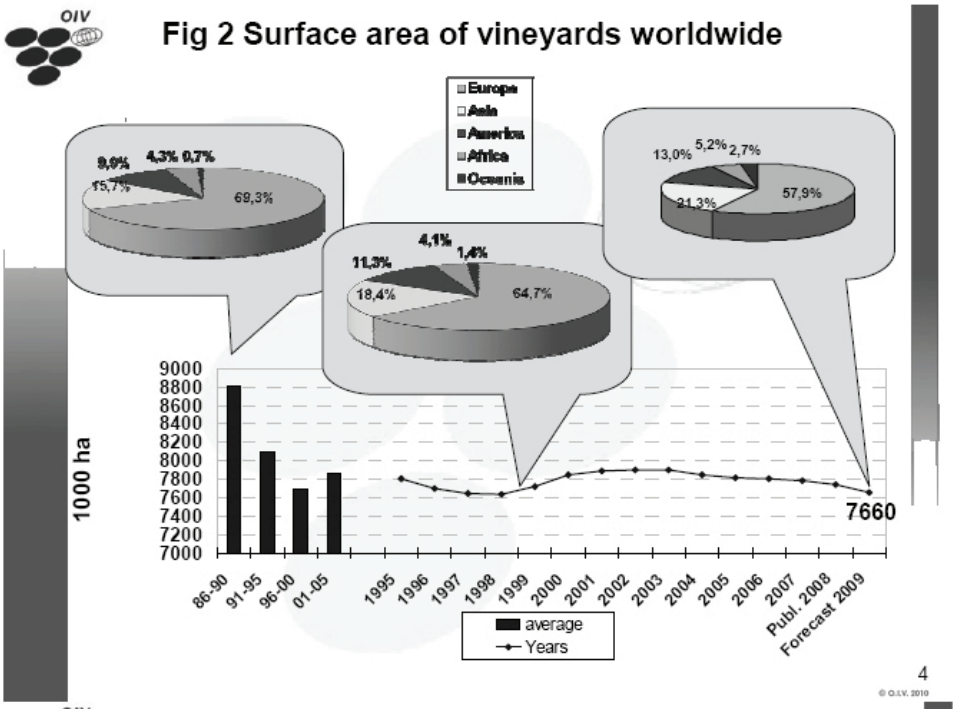
Chaneges of laws in the wine sector have slown down the drop. The French have cleared their vineyards to nearly 10,000 hectares, so that they no longer cultivate

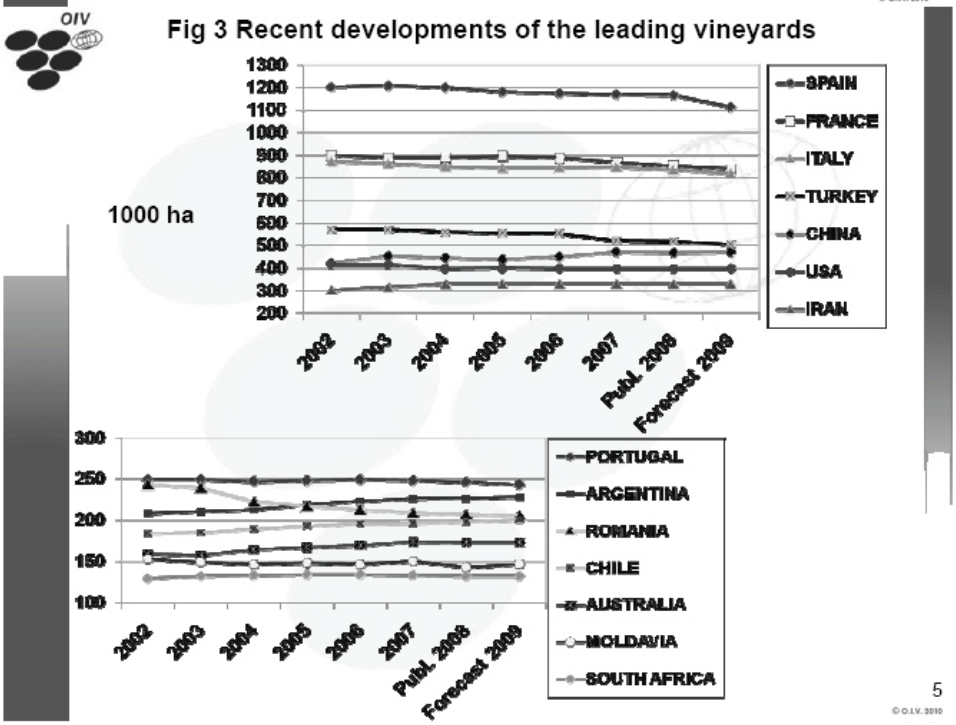
996,000 hectares of vineyard but rather 889,000. Quality is the key to success in France. The strategy of agricultural products with ”geographic indications“ (GLs) has been construed within the National Institute for Origin and Quality (Institut National des Appellations d'Origine – INAO). In addition, one should also know that: 90% out of the the total grape production in France is used for wine production, 50% of vineyards have their own wine cellars enclosed, 70% of wines make those with geographic origin while from 870 000 ha grapes is harvested and the wine with the controlled quality origin and the controlled and guaranteed origin and quality (PDO / PGI system) is produced.

Alternations in surfaces and production of grapes and wine (charts 2 and 3) have been clearly presented in the 33rd OIV Congress, held in Tbilisi in 2010.
When it comes to financial issues, the drop in the world wine offer to 61.1 % has been recorded with five leading European wine exporters – Germany, France, Italy, Portugal and Spain, even though they used to hold 78.8% of the world market production, near the end of the eighties of the preveious century. Therefore OIV (the International Organization of Vine and Wine) warns that decrease in wine consumprion might cause great problems for vintners in the countries, such as Italy, in which domestic demand traditionally stimulates production.

Producers from South America – Argentina, Chile, UAR, Australia and New Zeland record all the bigger share in the world production of wine. Producers from the mentioned part of the world had the share of about 3.1% in the world wine commerce during the period 1986-1990. Now, that percentage is 28%. The New World producers have also recorded increasing consumption of wine. E.g. about 20 million hectolitres of wine are produced in USA, while the consumption exceeds 26.5 million thereof. According to experts, increase in the wine consumption in this country is also the consequence of the immense advertising effort and skill. It has also influenced the import, since the import of foreign wines has greatly increased in order to satisfy domestic demand. Serbian wines are present on the American market too. When it comes to other countries from the South American continent, e.g. Brasil, its wine production has also increased, so that the country is expected to become influential wine force.

In the East, in the Asian continent, China and India also develop their wine production.


OIV
Fig 2 Surface area of vineyards worldwide
Europe
Asia
America
Africa
Oceania
9,9%
4,3%
0,7%
15,7%
69,3%
11,3%
4,1%
1,4%
18,4%
64,7%
13,0%
5,2%
2,7%
21,3%
57,9%
1000 ha
9000
8800
8600
8400
8200
8000
7800
7600
7400
7200
7000
7660
86-90
91-95
96-00
01-05
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Publ. 2008
Forecast 2009
average
Years
4
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OIV
Fig 3 Recent developments of the leading vineyards
1000 ha
1300
1200
1100
1000
900
800
700
600
500
400
300
200
SPAIN
FRANCE
ITALY
TURKEY
CHINA
USA
IRAN
2002
2003
2004
2005
2006
2007
Publ. 2008
Forecast 2009
300
250
200
150
100
PORTUGAL
ARGENTINA
ROMANIA
CHILE
AUSTRALIA
MOLDAVIA
SOUTH AFRICA
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## Production potential of Serbian Vineyards

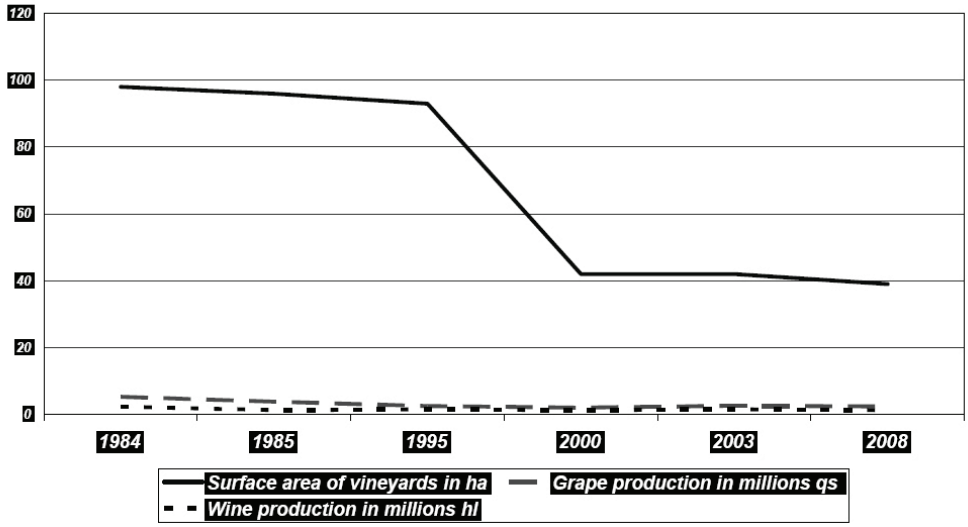
Vine is a perennial plant, the exploitation period of which should last between 30 and 40 years, depending on the cultivar selection, technological requirements and innovations. Therefore, the wine offer variety is of almost the same duration, since the wine cultivar determines production of a particular kind of wine. Vine is a widely adaptable plant, so that various cultivars have the ability to behave in a different manner under different circumstances while preserving all valuable characteristics. A creative space, viewed through time and accompanying requirements of the society, has been created through simultaneous development and spreading of autochtonous, new and introduced cultivars.

The other factor relevant for deciding upon vine planting is a high price of the plant growing. The Ministry of Agriculture, Forestry and Water Management of Serbia has passed a regulation prescribing obligatory analysis of soil and suitability assessment based exclusively on chemical characteristics of the soil. Geological foundation, terrain topography and physical characteristics of soil make its chemical characteristics. Therefore, one should insist upon a detailed soil analysis in order to prevent future mistakes and make production of the quality grapes stable, without considerable oscillations. Vineyards with autochtonous cultivars will be established with standard planting material, since it is the only one available on the domestic market. New vineyards with newly-produced and introduced cultivars should be established with certified planting material. Thus expansion of invasive kinds of insects, phytoplasma and their potential host plants would be prevented/delayed. Observation of the existing vine growing areas and potential changes in terms of spreading/diminishing is carried out through the forecast of climatic changes.

A potential vineyard or wine cellar owner/beneficiary, on the one side, and the Ministry of Agriculture, Forestry and Water Management, as a donor implementing subsidies, on the other side, cannot, as individuals, implement all these requirements. The important link are scientific-educational institutions which could use their knowledge and abilities to make implementation of all five major elements of ”geographic identification“ (GIs) preservation easier. The mentioned primarily refers to the promotion of typical characteristics of the product, motivation and coherence for initiating partnership, confirmation of advertising through the information provided for the producers which are ready to pay, adequate system of product protection and control.

Over the past twenty years, the surface under vineyards decreased by 25,000 ha, or 25,000 ha annually, on the territory of the Federal Republic of Yugoslavia, that is on the present territory of Serbia. Besides, data from the official statistical records and the Business Association ”Serbia wine“, in the possession of the records concerning the area of Serbia, differ considerably. Regardless of the data source, one may draw a conclusion that the grape and wine production annual rate of growth of 3% is hard to achieve provided that we do not pay enough attention to grape growing. Even though the planting fund has considerably depleated, there is a variety of cultivars, from autochtonous ones, newly-produced domestic ones, to the cultivars known all over the world.

Fig.4 Surface area of vineyards, grape and wine production in Serbia




*Data source: "Serbia wine", the Official Gazette of the Republic of Serbia, the Official Gazette of the Federal Republic of Yugoslavia*

The new law took effect in 2009, and ever since it has made production of wine with geographic origin much easier through the use of designations for the wine with geographic origin. Changes have been made in the structure of grape growing production areas, so that producers now have the opportunity to produce high-quality wines on wider geographic areas. The new regionalization of geographic grape-growing production areas has begun (the part concerning names, area borders, cultivars, maximum allowed yields). Thus conditions have been created for the production spreading over the large geographic areas (Vojvodina, Central Serbia, Kosovo and Metohija), for quality wines PDO[5]. and high-quality wines PDO[6] on the territory of the region PGI (with GIs), which is a partial solution to the problem concerning the lack of quality raw material, that is grapes.

## Pertaining capacitites of Serbian vineyard

Processing capacities have been constructed without any plan, so that today we have tens thousands tons of free processing space, which is mainly socially-/stately-owned, without any accompanying production areas / vineyards. There are processing capacities of 30,000 wagons in the central area of Serbia, 7,200 wagons in Vojvodina

5 Controlled Origin and Quality (K.P.K. kontrolisano poreklo i kvalitet)

6 Controlled and Guaranteed Origin and Quality (K.G.K.P. kontrolisano i garantovano poreklo i kvalitet)

and 8,000 wagons in Kosmet. Besides, Serbia has many commercial cellars, capable of processing 1,180 wagons of wine and other grape products, at its disposal.

According to the previous experience, wine processing in small processing capacities improves the wine quality, so that cultivar characteristics of vine become more obvious.

Grape growing and wine producing term ”terroir“ denotes to a particular geographic area, complexly observed through physical and biological measures of environmental protection and implementation of grape growing – wine producing practice, providing its development through clear characteristics of grape and wine products originating from the given area (Resolution OIV/VITI 333, 2010). Implementation of definition of the term ”terroir“ should help implement the Resolution VITI/04/2006, widen connections within the sector of grape growing and wine production, strengthen economic and cultural relations through the confirmation of division into zones and the use of the term ”terroir“. Once this definition has been confirmed, descriptive procedures within the grape growing and wine producing sector will be possible to implement, as well as to observe and recognize. It is especially important to point out differences between the descriptive definition of the term ”terroir“ and the oficial definition of ”geographic identification“ GIs (Castellucci, 2010).

Observing the latest definition of the term ”terroir“ and the potentials existing in Serbia, the recommendation would be to renew, reconstruct the processing capacities, that were constructed during the seventies of the previous century, in almost all vineyards of Serbia, or to build utterly new ones (the Strategy for Vranje Municipality Development, 2007).

## Wine– The export product

On achieving appropriate ”image“ on the domestic market, earlier before, after the sanctions, our wine houses made the possibility to conquer international markets during the following phase of strategic development. It will surely be a very tough work, which will require maximum knowledge, ability and skill in the struggle with foreign competition. International wine market is a strict filter of the former, possibly looseer, behaviour on the domestic market. There were rare examples of wine houses which presented a new product on the international market, or rather, such example has not been recorded in our research area. Opening to the international market, our wine houses have to start from the elements which may approximately determine possible events in the future. The existing decisions should, thanks to the earlier experience, be directed towards determination of strategic goals, and they should also operatively control all activities so that they might be carried out more effectively.

The most important factors that might influence our wine houses are institutionalized European economic integrations in which more strict forms of integration are promoted, and in which joint economic policy, as well as the joint market, is established, with all elements of customs and monetary union.

These are the elements which considerably endanger position of our companies

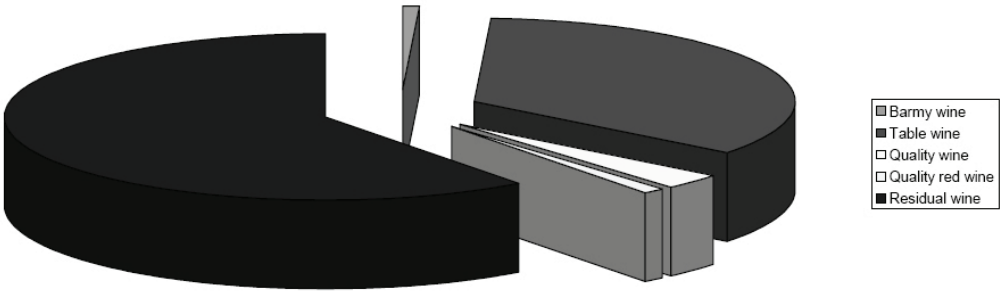
on the markets of the European Union, as well as of other countries our product will be placed on. Due to that matter also arises the question of our approaching European and world integrations, in which our diplomacy might play an important role. All this has a joint goal strategically defined as ***"Wine – the export product of Serbia"***.

On the other hand, the former movements of export, that is the ones prior to the sanctions, provide creation of the space for yet more intensive actions. During its final years, the former republic exported almost 1.3-1.4 million hl a year. That makes 20 percent of the total domestic production. The realized production in Serbia covers about one percent of the world production of wine, while potentials are even bigger. So, even under such circumstances, the increase in wine export to the demanding markets such as German, Slovakian, Czech, Russian etc. has been recorded.

## Wine quality as success determinant

A very important statement has been mentioned – wine quality is the success determinant, and when creating the strategy for wine export, it should be given the utmost importance. Provided that the standard quality is impossible to maintain, it would then have to be adjusted to the requirements of specific market segments. The recently passed Law on Wine (The Official Gazette of the Republic of Serbia 41/09) is completely in accordance with regulations of the European Union. Therefore, we have taken requirements of the European Union as the standard for our research, considering fulfillment thereof as the foundation for free conquest of other markets as well.

**Fig. 5 Export Serbian wines in compatively year 2006 by structure and amount**

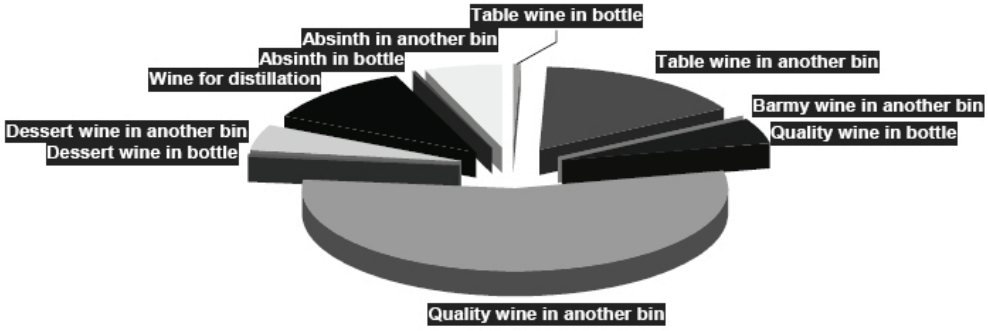



*Source: the Official Gazette of the Republic of Serbia, the Chamber of Commerce of the Republic of Serbia*

The exported quantities do not come even close to our possibilities. When it comes to organization and joint performance, there is much to be done. Comeback to the old markets has to be supported by a strong and quality offer on one hand and by the advertising activity on the other one. Maintenance of the standard quality has to be well taken care of. Stipulations of the European Union define many details the aim of which is to prevent deception of consumers. This refers to the allowed label quotations which are not compulsory, then stipulation no. 33/79 which defines the content of alcohol, signs, brands, regulations on the residual sugar content in wine, then the selection of the official language, the letter size on labels, quotations on the wines which do not have geographic origin designations, as well as compulsory entries with import documentation. Sanctions for default of the abovementioned stipulations also include ”prohibition“ to join the EU market. Certain deviations are allowed, e.g. from the German Wine Law, only in cases when the goods are immaculate from the health point of view and when a breach of regulations is not very serious. While all abovementioned is being determined, the goods have to rest and wait for the ”pity“ of official bodies, so that actually, it is not recommendable to count to such reliefs. During our researches, we have discovered that, when it comes to our goods, they have many a time been treated unjustly, while there have also been certain cases of the loss of domicile identity, when the goods was transferred to other kinds and origins. Regardless of the first results from the export expansion during the two last years, one may state that the potentials are not sufficiently exploited. Due to the complicated relations ruling the wine market, all activities have to be based on the programs established on the scientific level. According to its elements, wine is a complex product, so that market verification is pretty much relative, demanding much knowledge, persistence and professionalism in order to achieve the expected results. When export and import of our wines are compared, in the year 2003, there was a negative foreign trade balance at the amount of 10 million dollars. Factors influencing the increased import of foreign wines should particularly be investigated. Otherwise, the economy of capital as a daterminant of income and profit acquisition will lose its importance, and then the support of the state through the appropriate stimuli will have no effect. Profit recognizes no emotions, the capable ones will survive, as for the rest…

When it comes to realization of the idea from the title, the indicator should be simultaneous sale and advertising policy for the conquest of new markets and restitution of the positions to our traditional markets. As for traditional markets, activities on the advertising plan have to confirm our efforts to preserve production and quality, but the conquest of new markets includes such a strategy which is to be appropriate for all market segment, and there are various tastes. So, one should particularly take care of the matter, while the former presence of our wines confirms that the regional and currency orientation has been good so far, even advantageous, since industrially well-developed countries dominate the investments. According to the realistic predictions, the market of developing countries might be one of the directions of the influence of the programmed marketing activities. The world export until 2010 should exceed **six million tons of wine and the amount of six billion dollars**.

**Fig 6 Structure of export wine from Serbia**




As for the present state of facts, Serbian wine export cannot act more aggressively in particular market areas on its own, so that the inevitable conclusion would be that the organizational scheme of performance should be restructured in order to unify all relevant factors of the contemporary market business operation, the joint approach should be institutionalized while the market as a regulator of relations and an unavoidable factor on the long-run basis should be respected.

In order to protect or partly protect our wine production, we have to determine mutual regular implementation of interstate agreements between our country and the neighbouring agreement signatories (e.g. Macedonia). In case this statement has been confirmed, we would demand deductions or high-quality standard requirements to be introduced in order to make market competition fairer. Constatnt deficite incurred during exchanges of our wines with the foreign ones indicates the tendency for destruction of our vineyards. Especially since wines from certain countries enjoy Governmental support in terms of valid stimulations which provide a competitive price when the offer comes to clash with our wines.

Exchange of our wines for e.g. Russian oil should also be included within the strategy of the conquest of new markets or servicing the existing ones. As for the Russian market, that is the market of independent states, one should take advantage of the beneficial treatment for exchange of our goods, either individually or in a packet. The indicative number of 150-200 thousand our workers in Russia confirms the decision of more aggressive performance of our vintners on such markets. The fact that there is a commercial clause with Russia ”the most privileged nations“, according to which export of our products to Russia and vice versa without customs and other burdens is allowed, also witness the above stated. The principle of ”justification to the country“ for irrational business operations of wine stores should be abolished. Wine shop man-

agement, as well as the production for sale, have to be modernized based on all levels, through new people and new ideas. Constatnt education and exchange of professional knowledge is permanent assignment of all profiles of staff. On the other hand, one may notice the necessity to classify the domestic wine brand intended for foreign markets. Transformation of the geographic origin system and the future regionalization will provide better competitiveness of domestic wine producers. In order to give special significance to Serbian wines, strengthen the position of domestic wines when compared to all the more imported ones, and gradual establishment of the brand, the Republic of Serbia has commenced transformation of the geographic origin system and adjustment of the mentioned system to the production of high-quality wines. With new types of wines, the proof on the domestic market, and then with the confirmation with the designation or the reference stamp that such wines may be an exporting brand. Failure to observe the European Law on Wine or EWG, considerable damage would be imposed upon the complete project. A strict control of the export brand should be determined in order to preserve already acquired positions on particular markets in Europe and the world. The space for regionalization vineyards and protection of the geographic origin of wine are to be determined. The targeted wine value quantity size will be 200-300 million dollars, with permanent market researches, until the year 2012.

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Economics of agriculture
SI – 2
UDK: 339.13:637.1 (497.11)

# IMPERFECT COMPETITION IN DAIRY INDUSTRY IN REPUBLIC OF SERBIA[1]

*Vesna Paraušić, Vladana Hamović, Branko Mihailović*[2]

## Abstract

*Serbia has natural, human and economic resources in the primary production and the dairy industry, but they are not used in the right way that would lead to economic satisfaction of all market participants, especially producers and consumers. The paper focuses on under-developed competition policy on the milk market in the Republic of Serbia. Particularly noteworthy is the need for state to participate actively in order to correct market failure and increase production, consumption and exports of milk and dairy products.*

***Key words**: market, imperfect competition, competition policies, dairy industry.*

## Introduction

The noticeable facts in the domestic retail market of agricultural food products in the second half of 2010 are represented in the shortage of basic foodstuffs, especially milk, some dairy products (especially butter) and sunflower oil. The authors attempt to focus on the problem of professional community, and to present the main reasons for this situation and ways to overcome it. Emphasis is placed on the milk and dairy products market. It is evident that the domestic market is unable to allocate resources in the areas of primary milk production and processing ensuring maximum benefits for producers, consumers and the overall economy and society. At the same time, the role of government in correcting market failure is very small and mostly reduced to the

1 This article represents a part of two project: (1) Project no. 149007 D research results – Multifunctional Agriculture and Rural Development Aimed at EU Integration of Serbia, financed by the Serbian Ministry of Science; (2) Project no. 2009/223-318 Solutions and interventions for the technological transfer and the innovation of the agro-food sector in South East Regions – TECH.FOOD", financed in the frame of South East Europe Transnational Cooperation Programme (SEE Program).

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role of mediator and negotiator between primary producers and processors, and dairy industry. This role of government is clearly not sufficient. Its responsibility should be much larger, and the role of active, constructive and consistent with practice in developed market economies.

## Market failure based on the purchase of raw milk and production of industrial milk in R. of Serbia

The following types of **market deviation from perfect competition** (situations where market fails to make an efficient resource allocation) are recognised in economic literature (these are also the main reasons or arguments for government intervention)[3]:

1. Market structures with varying degrees of imperfect competition (occurs when the actions of individual market participants, buyers or sellers can influence the price and the amount of certain goods). Two main causes of imperfect competition are: (1) effects of the economy of scope, i.e. decreasing average costs; and (2) barriers to market entry (high entrance fee can be determined by high technology or achieved standards)[4].
2. Side effects or externalities.
3. Market participants that are insufficiently informed about goods and services they buy or sell.

In R. of Serbia non perfect competition in the agricultural and food products is characterized by oligopson market structure, underdeveloped competition policy, "grey" economy and "broken" ownership and contractual relationships, covering primary production and processing during the privatization of the processing sector.

Specifically, the domestic market purchase of raw milk has the following characteristics regarding market structures of oligopsony[5]:

- The high degree of concentration in the dairy-plant sector**.** For example, in the majority ownership of the company Danube Foods Group BV two dairies are presented, "IMLEK" and "Dairy, Subotica, where in 2006. and 2007. there merged a number of other dairies (Zemun, Zajecar, Novi Sad Dairy). All diary plants clusters within the Danube Foods Group were formed following the founding of the Commission for Protection of Competition. Logical analysis

3 Samuelson and Nordhaus (2000:31-32, 272); Burda and Wyplosz (2004:414).

4 Market distortions on the supply side (small number of suppliers - producers or distributors of products) imply oligopoly, duopoly or monopoly structures. These result in reduction of supply levels and higher prices, and generally represent a threat to consumers. On the other side, market distortions on the demand side (small number of buyers as compared to large number of sellers) lead to oligopsony, duopsony or monopsony structures, which can result in reduced demand levels, reduced prices and production, and consequently producers, will suffer losses.

5 Decision by the Commission for Protection of Competition of the Republic of Serbia, dated 25 January 2008.

leads to conclusion that in small market economies and economies with undeveloped market mechanisms, such as is local Serbian economy, these collusions could easily have negative impact on local competition.

- According to the Decision by the Commission for Protection of Competition of the R. of Serbia from 2008, dominant participation in purchase and processing of raw milk in the domestic market (47.4% in 2006) is held by one competitor (DANUBE FOODS GROUP B.V.), and the position was abused by imposing unfair business terms and conditions to achieve higher profits[6]. The Commission found series of irregularities, including the procedure for establishing raw milk quality, establishing milk purchase price, primary producers' obligations, diary-plant rights, etc.
- A large number of small farmers on the supply side of raw milk, with low economic strength and as a result of disorganization, low negotiating positions on issues impact on the conditions of purchase and establishment of purchase prices of raw milk. Dairy industry includes over 280 thousand raw milk producers on the supply side, where around 80% of these producers have 1 to 3 heads of dairy cattle and at the same time sell their milk to a dairy plant[7]. At the same time, the data collected in dairies "Imlek" regarding the number and size of their suppliers in 2006. year indicate that most suppliers of dairy (up 99%) are small producers, who produce between 5,000 and 50,000 liters of milk per year[8].

The negative consequences of underdeveloped competition in the market purchase of raw milk are numerous and clearly indicate the serious problems that come up if the dairy sector is solely left to market forces. Some of the consequences that are already present or are likely to be up to them in the future will include the following:

- **Decline in production of raw milk,** as a result of reduced demand or/and unattractive purchase prices.
- **High prices consumers pay for milk and milk products and low price achieved by direct agricultural producers at purchase.** Milk purchase price is the lowest in the region and Europe, while retail price is among the highest. This is particularly true for sterilized milk, where a single company has a market share of 87%[9].
- **Lack of competitiveness in international market**, resulting in low foreign currency profits generated from export of milk and milk products. Exports of milk and dairy products predominantly aimed to the CEFTA countries, and exports to

6 In 2006 there were registered 211 dairy on domestic market. Among these dairy, and apart from one dairy with 47.4% market share and three dairy with individual share of 3.9-5.8%, all other dairy had individual share of milk purchase of less than 2%.

7 The National Programme of Agriculture of Serbia 2009-2011, March 2009, Serbian Ministry of Agriculture, Forestry and Water Management, page 39.

8 Decision by the Commission for Protection of Competition of the Republic of Serbia, dated 25 January 2008.

9 The National Programme of Agriculture of Serbia 2009-2011, March 2009.

the EU has been disabled by inadequate quality (especially the significant problem of low quality raw milk) and cost non competitiveness;

- **High poverty rates among rural population;** sector of dairy industry includes over 280 thousand producers, thereby contributing significantly to the rural development of Serbia (80% of milk producers own 1 to 3 cows and at the same time sell their milk to a dairy plant).

This is especially necessary to emphasize the following. Although olygopoly/olygopsony can damage competition and enable large companies to create high profits at consumers' and producers' expense and expense of economic advance in general, such market structures are the rule in all countries and most industries. Also, these market structures are not always undesirable, nor are they easy to avoid. For example:

- Numerous, high and dynamic requirements of the environment, technology, and organization itself (introduction of standards, effects of economies of scale) – leading to concentration (partnerships/alliances) of capital and companies. This has made many industries stronger, and each economic branch ended with a few dominant giants[10].
- Olygopoly/olygopsony enable organisations to offer better products at lower prices, due to better production organisation, better efficiency, effects of economies of scale. They also introduce technological standards and innovation by investing into research and development, marketing etc[11];

Oliopson placed on the agricultural products market in R. Serbia also **can not be avoided,** regarding the fact that domestic market is small, aggravating features of placements, especially exports, high technological requirements of production standards in the system of food safety and quality, the EU requirements and the like. At the same time, it is indisputable that oligopsony to some extent is **extremely useful** in our market providing a contractual relationship between processors and agricultural producers (farmers, thereby reducing market risk), contributing to improvement of the quality and the introduction of standards in primary production and processing of milk and the like. For example, a company Danube Foods Group BV since the beginning of dairy privatization significantly invested in improving the quality of milk and the introduction of the required standards. Also, in a situation of constant dissatisfaction with the price of dairy farmers, Competition Commission observes the tendency of milk to bind to dairies within the Danube Foods Group BV (providing a long-term and continuous purchase), even under the condition that other dairies offer for 5-10%

10 For example, the industry grain flakes for breakfast in the U.S. is oligopoly that controls several companies, although it seems that the diversity of cereal is infinite. Paul A. Samuelson, William D. Nordhaus: Economics, Fifteenth Edition, 2000. Mate, Zagreb str. 151.

11 Vaknin (2006), http://www.globalpolitician.com/21565-governanceThe Benefits of Oligopolies.

higher price of raw milk[12]. However, the role of government (antitrust policy) must be strong and effective when it comes to abuse of monopoly position by one or more participants. For example, in developed economies there is an active state role in the field of competition, which is provided by primarily effective judicial system.

## The role of government in correcting market failures on the purchase and production of milk

It has been observed in the economic literature that one of the **main tasks of a state** in a market economy is to **correct errors, i.e. increase market efficiency**. The main economic policy measures aimed at the achievement of this goal are: (1) efficient protection of competition policies (anti-monopoly laws); (2) encouraging competition; (3) regulations (state supervision over private companies)[13]. However, it is obvious that states, or governments, do not demonstrate genuine interest (political will) in implementing anti-monopoly laws. This problem is especially prominent in developing and transition countries, which are characterised by undeveloped institutions, high corruption rates, high and inefficient public spending, etc. Therefore, it seems that adjusting production levels and purchase prices to interests of trading companies, distributors and retailers, has much more negative impact on income and profitability of primary agricultural producers in these countries than in the developed countries.

Although the R. Serbia adopted many laws and regulations governing the area of competition, competition policy is insufficient, and the efficiency of antitrust policy is a small. Competition policy in the R. of Serbia began to legally define the 2005th when it enacted the Law on Protection of Competition[14] and when it was established Commission for Protection of Competition, with the aim to improve economic efficiency and accomplish economic welfare for the society as a whole, particularly consumers` benefit. According to lawyers' and economists, main weaknesses of Competition Low from 2005 include insufficient material-legal norms and total absence of practical implementation of existing norms (primarily due to the small powers of the Commission and inefficient judicial system)[15]. The new Competition Law has been enacted by the Serbian Parliament in July 2009 (it will be applicable from November 2009.). New Law relating to the previous, first of all, differs in the fact that the Commission has received considerably more authority in the action (the ability to implement "fully fledged dawn raids", the right to order the Commission deconcentration and other structural measures, etc..), and provides the possibility that the Commission directly impose

12 Decision by the Commission for Protection of Competition of the Republic of Serbia, dated 25 January 2008.

13 Samuelson and Nordhaus (2000:176).

14 Law on Protection of Competition (Official Gazette of the R. of Serbia", No. 79/05 and 51/09).

15 White book 2008, Foreign Investors Council.

fines on enterprises after the violation decision. From a material law perspective, the new Competition Law basically does not bring about major changes (e.g. in relation to restrictive agreements and abuse of a dominant position).

Although the new Law on Protection of Competition, problems in implementation are still present, primarily because of the inefficient judicial system, which suspends or slows down the process of proving the monopolistic behavior. In recent years there were no sanctions for violation of competition and any act of the Commission has been confirmed in court. The Commission does not have a good track record in terms of more complicated cases. Based on public knowledge, whenever its decision was challenged before the Supreme Court of Serbia, the court decided to take the claimant's view and annul the Commission's decision. In all fairness, grounds for annulment have mostly been of formal nature[16]. For example, two decisions of the Competition Commission, which indicate that the company Danube Foods Group BV largest processor of milk in Serbia and that has abused a dominant position in the purchase of raw milk have not yet received a certificate in court[17]: (1) The first decision of the Commission in January 2008. The Serbian Supreme Court after the company the Danube Foods Group in March 2009, appeal, has voided[18]; (2) Another solution encourages the Commission in 2009. though still in the process for the Administrative Court. However, as the Administrative Court during year 2010. is resolving disputes dating year 2007. , the court ruling will be more than overdue.

## Suggestions for improving the efficiency of market milk and dairy products

Concerning the specific market trends of primary agricultural products in R. Serbia fundamental role of government in correcting market errors should focus on the following:

- Strengthening the institutional capacity of the state, and ensure effective legislative, judicial and executive authorities, to ensure the detection and sanctioning of those companies that distort competition. For example, without an efficient judiciary system, it will not be possible to ensure efficiency and credibility of activities of the Commission for Protection of Competition, it will be difficult to investigate and demonstrate even the most obvious abuses of a dominant market position, particularly more complex ones, such as: various blackmails or influencing suppliers, transferring profits on other business entities, etc.

16 White book 2009, Foreign Investors Council, page 45-46.

17 Politika, 20.09.2010. Slowness of the courts postpone proving monopoly. http://www.politika.rs/rubrike/Ekonomija/Bajalovic-Sporost-sudova-odlaze-dokazivanje-monopola.lt.html

18 At issue was the question of the total amount of milk in relation to the estimated contribution of dominant companies.

- Consistent application of the Law on Protection of Competition.
- Encourage competition, i.e create conditions for free market game in a regulated market (encouraging small companies, efficient ownership rights protection, easy and fast procedure for registering businesses, stronger competition by reducing customs duties and taxes, etc.).
- Establishment of the Agency for intervening in the market (reform of the Directorate for Commodity Reserves by model agencies for emergency purchase of the EU), which would be under clear rules and transparent manner carried out intervention in case of errors occurred in the functioning of markets.
- Integration of goods supply by developing agricultural clusters, stronger farmers' associations and established farmers' cooperatives. Only by joining forces, farmers will become able to increase their sources and their negotiating power will be considerably stronger, both in relation to the state, and in relation to the food industry, food trade, exporters. It is important to stress that cooperatives will only be able to fulfill their role when the new Law on Cooperatives is adopted, especially its consistent implementation in the area of efficient cooperative audit[19].

## Concluding Remarks

The main problems that exist in the supply of the domestic market with milk and some dairy products (especially butter) are mostly the result of: (a) lack of strong competition on the purchase of raw milk (market structure oligopsony), (2) broken property relations between the primary and processing dairy sector through the privatization process, (3) ineffective role of government in correcting the mistakes of the market, or in the application of antitrust policy.

The existence of oligopsony (imperfectly competitive) in the market of agricultural food products - represents the market situation which is typical for almost all countries and most industries and can be justified by a number of economic reasons. However, what separates the market structure in oligopsony in Serbia and other underdeveloped countries as countries in transition from these structures in the developed economies is the following. In developed economies there is an active state role in the field of competition, which is provided by primarily effective judicial system. At the same time, support from the agricultural budget is a significant to primary producers, and the links between the primary and manufacturing sector are strong and based on long-term contractual relationship or equity relationship (usually the primary producers of raw milk are simultaneously a dairy specialist members of cooperatives and also dairy shareholders). On the other hand, in R. Serbia , during the privatization, the correlation between the ownership and of primary and manufacturing sector has missed, followed by under-developed state of law and policy of competition (an inefficient judiciary limits the full implementation of the Competition Law), and

19 For more, refer to Paraušić, V., Cvijanović, D., Subić, J. (2007: 49-97).

support from the agricultural budget to farmers is much lower comparing to the EU.

Generally, increasing the efficiency of the competition policy and improvement of legislative, judicial and executive authorities (building the rule of law and consistent application of the Competition Law) – represents one of the main routes that the state should follow improving milk and dairy products market. Whether and how state will be determined independently and in collaboration with the private sector to ensure the development of this market in the future is under a big question mark. But it is quite certain that Serbia, like other transition economies, inevitably, is "waiting for" the improvement and strengthening of competition policy, especially given the ongoing processes of liberalization of tariff and non-competitiveness of dairy farming sector in the EU market.

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Economics of agriculture
SI – 2
UDK: 368.5 EU

# THE BUSINESS INSURANCES IN THE AGRICULTURE OF SELECTED EU COUNTRIES

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## Abstract

*The aim of this paper was to present a general situation of the development of agricultural business insurances in the selected EU countries. The Polish case was particularly included. In the analysis both the descriptive statistics and tables methods were used. It was assumed that the development of business insurances in the selected EU countries is diversified and depends on the amount of public assistance of a given country to agricultural sector. A great contribution in the agricultural insurance market development (crops and animal farms) in the EU countries can be attributed to state subsidies thanks to which the state can provide financial assistance to agricultural production insurance. It is an important step towards making such insurance policies more popular, giving tangible benefits to the state, insurance companies and the insured themselves. Subsidising the premium by the state or co-financing the costs of reinsurance is a model example of the public-private partnership, aiming to cover all the agricultural producers exposed to specific risks with insurance.*

***Key words****: economic insurance, risk, risk management, insurance subsidies*

## Introduction

The changeability of weather conditions, liberalization of agricultural policy or corporate activity globalization are only some of the problems the 21st century agriculture is facing. The problems concern a very important issue, namely the changeability of farming conditions, and thus the risk of running a business and its management. In most EU countries risk management in agriculture is limited to using simple economic tools (e.g. production diversification). More sophisticated financial risk management methods concern mostly unforeseeable weather event insurance. The agricultural insurance systems operating in the EU countries are highly diversified.

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The present paper covers the problem of risk management in agriculture. A detailed analysis involved the agricultural economic insurance market in selected EU states. The theory presented here has been developed based on both international and domestic literature. The statistical data analysis has been developed based on the information from 2005-2009 annual and quarterly bulletins of the Financial Supervision Committee as well as the 2009 European Commission reports. The analysis involved the application of descriptive statistics methods and table breakdowns.

## Essence of risk and risk management in agriculture

The applicable literature provides many risk definitions referring back to the probability of obtaining a result other than expected [Kaczmarek, 2006], while all the reasonable actions which involve decision-making concerning risk faced by a given entity are part of management. Such actions aim at limiting negative effects of risk implementation. The factors which can have a significant effect on insecurity of running agricultural business cover plant yield, effectiveness of applying a new technique and methods and kinds of production [Orłowski, Wojtaszek, 1973], natural environment pollution [Stroiński, 2006], variation in characteristics and income fluctuations. The list of the factors is extended by the phenomena caused by climate changes, epidemics, competitive relations on agricultural products market, agricultural policy, opening of the markets and international trade conditions.

Considering the potential sources of risk, in agricultural activity the following kinds of risk can be distinguished: production risk, price risk, institutional risk, financial risk as well as human factor risk (the so-called personal risk) [Blanc, 2003; Cordier, Erhel, Pindard, Coureleux, 2008; Klimkowski, 2007]. The greatest importance in running agricultural business is attributed to production risk resulting from the specific nature of agricultural production as well as to price risk connected with the agricultural produce prices instability on the market. The occurrence of such types of risk leads to the emergence of income risk, being an effect of damage inflicted on in the production process as a result of the effect of weather factors and a consequence of the existing economic freedom of the market economy. With than in mind, both farmers and the state take various kinds of decisions and actions to limit the risk in the surroundings of agriculture, referred to in the applicable literature as risk management. Such actions incorporate foreseeing and limiting potential threats and the accumulation of means which could make up for the losses upon their emergence [Kaczmarek, 2006; Preś, 2007; Pawłowska-Tyszko, 2009]. The tools facilitating risk management can include economic and market instruments, the so-called risk division instruments [Berg, Schmitz, 2008]. The risk management instrument being most frequently applied is insurance since the basic problem connected with risk management in agriculture is focusing on its traditional approach, namely taking up protective measures towards threats which could cause losses than on the real actions aiming at using the occasions and building up a constant value added on the farm. Besides, the actions taken up as

part of the economic policy demonstrate that there is a certain pressure on increasing the share of market methods and private co-financing the elimination of risk in agriculture, which means a general principle of crop insurance, and thus the stabilization of income by those interested; agricultural producers.

## Risk management systems in EU countries

The risk in agriculture, especially price and production risks, irrespective of their causes, can be limited by e.g. a traditional purchase of the insurance policy. In the EU member states insurance is the most common form of security from the risk since insurance is a fair transfer of risk from one entity to another in exchange for a premium [Hatch, 2008]. Besides, they ensure the coverage of future financial needs caused by the events of force mayeur, by distributing the burden of the coverage upon many entities exposed to the same events of force mayeur [Łazowski, 1948].

Agricultural insurance is especially promoted in the countries where the law forbids the *ad hoc* funds or natural disaster funds to compensate for the damage which could be covered by insurance. And thus everything what could be covered by insurance is to be covered by insurance, however, if the farmer fails to meet that obligation, he must be aware that he will not receive any external support. In Greece, Spain, Austria, Portugal and Sweden, for example, there exist no pubic fund payments if the insurance of the damage was possible earlier. However, in many countries, also in Poland, clear regulations on how to allocate public funds to cover the losses in agriculture are missing.

The funds addressed to agriculture for the purpose of risk management are used by EU countries in different ways; e.g. in France one can observe a high level of *ad hoc* payments (2000-2005: 1167 m euro) and an inconsiderable level of insurance subsidies (5 m euro/year). In Spain the situation varies slightly; *ad hoc* aid over 2000-2005 was 225 m euro, for the purpose of insurance subsidies there was allocated about 230 m euro/year, which demonstrates that the approach to the use of public funds for risk management differs across the countries.

Insurance systems in agriculture in the EU states vary. Single risk insurance is most common (Table 1), operating as private insurance; unsubsidised or private with state payments. Table 1 presents the countries which have introduced private insurance systems with state payments, while in the other member states (except for Greece and Cyprus) agricultural producers can benefit from unsubsidised private insurance. In 2008 the total annual value of the premiums collected in the EU-25 countries was about 1539 m euro (without the public system in Greece), while the annual total amount of compensation was about 1061 m euro.

*Table 1 - Agricultural insurance in the EU countries*

| Country | Single risk insurance | Market penetration (%) | Total value of premiums (m Euro) | Value of the compensation paid (m Euro) | Gross full premium ( %) |
|---|---|---|---|---|---|
| Austria | PS | 78 | 520 | 320 | 61 |
| Cyprus | GC | 100 | 87 | 45 | 52 |
| Czech Republic | PS | 35 | 320 | 240 | 75 |
| Greece | P; GS + G | 100 | (.) | 2180 | - |
| Italy | PS | 8 | 2712 | 1662 | 61 |
| Latvia | PS | <1 | 1 | (.) | - |
| Lithuania | PS | 1 | 11 | 11 | 100 |
| Luxemburg | PS | 45 | 13 | 10 | 77 |
| Poland | PS | 7 | 99 | 63 | 64 |
| Portugal | PS | 22 | 469 | 302 | 64 |
| Romania | PS | 12 | 140 | 44 | 31 |
| Slovakia | PS | (.) | (.) | (.) | (.) |
| Slovenia | PS | 17 | 95 | 138 | 145 |
| Spain | PS | 26 | 5647 | 3883 | 69 |

*Source: developed based on M. Bielza Diaz-Caneja et al. Risk Management and Agricultural Insurance Schemes in Europe, JRC Reference Reports, European Commission 2009, p.15*

*Legend: PS – subsidised private insurance; GS – public insurance, partially subsidised, G – public unsubsidised insurance, GC – public obligatory insurance*

The full premium of the subsidised insurance of agricultural production in the EU countries reached an average level of 60 to 75% with some exceptions, e.g. in Slovenia 145%, and in Romania only 31%. Important factors which decrease the significance of full premium of insurance is reinsurance and public support. The assistance addressed to the agricultural sector in a form of insurance premium subsidies varied across the EU countries. In Italy such assistance accounts for about 67% of the total amount of premiums; in Spain about 49%, and in Austria about 46%. In France the insurance subsidies on average for three years account for only 2.5%, which is due to no single risk insurance subsidies. Interestingly, since 2005 in France there have been launched new insurance products in a form of subsidised crop insurance which accounts for 35% (40% for young farmers). In Slovenia, Latvia, Lithuania and in Poland insurance subsidies appeared as late as in 2006. They refer to basic risk groups (grad/ hail, fire, thunderstorms) and in Slovenia account for 30-50%, while in Poland, Latvia and Lithuania – for 50%. However, despite such high payments, the level of market penetration is low, from below 1% in Lithuania to 7% in Poland. The total annual amount of agricultural insurance subsidies in the EU-25 in 2008 was about 497 m euro. The total annual amount of *ad hoc* aid in the EU-25 allocated to agriculture was 904 m euro (excluding animal production aid).

The variation in the public assistance addressed to the agricultural sector results from the agricultural policy of a given state addressed to the promotion of specific sub-sectors or varied types of farms. Some countries combine all those objectives and form a cohesive insurance system addressed to the agricultural sector, considering it to be an important instrument of the agricultural policy stabilizing agricultural income. It is the case, e.g. in Canada and the US. In the EU countries it is difficult to point to typical insurance instruments which would bear the qualities of income insurance. In Great Britain, for example, private insurance companies have introduced cereal production insurance packages. The packages, in their nature, are fixed term instruments with traditional insurance based on the purchase of the policy. Their popularity, however, is still, inconsiderable due to no insurance premium subsidy and poor knowledge of derivative instruments.

## State of economic insurance in Polish agriculture

The gross insurance premium is considered to be the basic measurement of the insurance market situation. In 2008 the total gross premium for property insurance in Polish agriculture was PLN 524 m and reached the level 40% higher than in 2005, which, in fact, means a real increase in the premium by over 30%. This situation has been generated by increased revenues from obligatory insurance premiums as well as optional insurance of agricultural crops and farm animals. The most dynamic increase over 2005-2008 was recorded for gross premiums for optional insurance of crops and farm animals. Over the period studied the increase was almost three-fold. However, it should be noted that between the year 2007 and the year 2008 the amount of the premiums remained almost unchanged and in real terms there was recorded an even slight, over 3%, decrease. The situation with compensation paid over that period to agricultural producers is slightly different; the indemnity decreased almost by 2%, which in real terms stands for a 5.6% decrease. The most dynamic increase over that period was recorded for the value of compensation paid for the optional insurance of crops and farm animals. The claims history in 2008 in the segment of optional insurance of agricultural crops and farm animals increased considerably (by 31.3 percentage points), as compared with the value recorded in 2007, while in the global approach it decreased slightly from 65.9% to 60.1%. Such a considerable increase in the risk of reinsurance in agriculture triggers a number of fears, especially in reference to the insurance of catastrophe-related risk and makes insurance companies' interest in that market poor. Besides, crop and animal farm insurance in Poland today stands for expensive insurance policies a little (7%) group of agricultural producers benefit from.

In 2008 for such property insurance subsidies the state budget allocated PLN 545 m. The amount covered farm animal insurance premium subsidies (PLN 25 m), agricultural crops insurance premium subsidies (PLN 135 m) and the drought damage subsidies (PLN 385 m). In 2009 only PLN 150 m was allocated to that purpose. That situation is connected with e.g. lower, than expected, subsidies made to the crop and farm animal insurance agreements entered into with farmers in the previous years. In

the first year of insurance subsidies there was used only 3.5% of the amount allocated to that purpose. However, in 2007 from the amount of PLN 210 m allocated, there was used as much as over 65% of the subsidies. Such a low total use of insurance subsidies must be referred to low insurance awareness of agricultural producers, poor information campaign, and insurance companies' offers including competitive products sold under commercial conditions being more favourable for the farmer. Interestingly, what is also missing is the widespread insurance subsidies proposed and, on the other hand, the operation of *ad hoc* state measures to finance the effects of natural disasters of high range, which can have an unfavourable effect on the development of that support instrument. Most probably introducing a common agricultural crop and farm animal insurance obligation could solve that problem.

## Conclusions

Risk insurance in European agriculture by insurance companies is a supplementary form as compared with the CAP instruments. Nevertheless, it is getting more and more important with a gradual implementation of directional changes in the Common Agricultural Policy. A great contribution to the agricultural insurance market development in the EU countries can be attributed to state subsidies thanks to which the state can provide financial support to agricultural production insurance. It is an important step towards making such policies more popular, giving tangible benefits to the state, insurance companies and the insured themselves. Subsidising the premium by the state or co-financing the reinsurance is a model example of public-private partnership, aiming at providing the insurance coverage to all the agricultural producers exposed to specific risks.

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UDK: 633.71 (497.7)

# REGIONAL SPREAD AND GROSS MARGIN IN THE PRODUCTION OF TOBACCO IN THE REPUBLIC OF MACEDONIA

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## Abstract

*Based on the statistical data (2005-2009) the first part of the paper analyses the areas under tobacco production and the tobacco production by regions in the Republic of Macedonia. Accordingly it was found that 86,7% of the total area, i.e. 85,3% of the total tobacco quantity is produced in the Pelagonia and South-east region.*

*Total of 24 producers were surveyed in all 8 regions. The aim of the survey is to determine the scope and structure of the total income and variable costs, and than the gross margin and price. The authors find that the value of production ranges between 3.538,3 EUR/ha in the Skopje region and 9.034,3 EUR/ha in the Polog region. The same relationship is found in the variable costs, or on average 3.982,3 EUR/ha, and individually range from 2591.8 EUR/ha in Skopje region to 5.199,0 EUR/ha in Polog region. Tobacco producers in the northeast region realize the lowest gross margin (1.130,6 EUR/ha) while the highest (5.780,7 EUR/ha) is found Polog region. At the same time, producers in the northeast region, produce tobacco at the lowest price (1,70 EUR/kg) and highest (2,65 EUR/kg) priced tobacco is produced in the easte region.*

***Key words**: region, total income, variable costs, productivity, gross margin, price.*

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## Introduction

The territory of the Republic of Macedonia has a total land area of 2.571.300 hectares. In 2007,the agricultural land covered 41.89% or 1.007 million hectares whereas the cultivated area was less than a half (48,84 ) of the agricultural land.
In December 2007, the Government of the Republic of Macedonia adopted the Nomenclature of Territorial units for Statistics – NTES (Official gazette of the Republic of Macedonia No.158/07).

The basic goal of the nomenclature was to provide statistical data at regional level and to comply with the new regulation for NUTS[4] No. 1059/03 adopted by the European Parliament in 2003 which regulates the establishment of a common statistical nomenclature of territorial units. With this nomenclature, the Republic of Macedonia is divided into 5 levels. The third level (NUTS-3) refers to statistical regions. The main criterion for the third level of NUTS is the population in the statistical regions which should not be less than 150.000 inhabitants. According to this criterion, the Republic of Macedonia is divided into 8 statistical regions (Fig. 1).

*Fig. 1 – Statistical regions in the Republic of Macedonia*




The aforementioned principle i.e. criterion is observed (see table 1). Other indicators for regions show that the highest concentration of the total and working age population is in the region of Skopje with relative participation of 29,1%. On the other hand, the region of Vardar is with the smallest concentration. The Southeast

4 NUTS- Nomenclature of Territorial Units for Statistics

region has the highest employment rate. The region of Skopje is a region where most products are finalized whereas the Northeast region is a region with the lowest gross value added on new products. Agriculture (along with hunting, forestry and fishing) is the most developed in the Southeast, while the Southwest region has the lowest level of development (according to the level of value gross added). Judging by the level of GDP, Skopje region has the most productive population, and Polog the lowest.

*Table1. – Some important general indicators for the regions in 2008*

| Indicators | Republic of Macedonia | Region | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Vardar | East | Southwest | Southeast | Pelagonia | Polog | Northeast | Skopje |
| Total population | 2046898 | 153902 | 180260 | 222142 | 172362 | 234902 | 312607 | 174276 | 596447 |
| Working age population | 1633341 | 122138 | 152504 | 176191 | 141859 | 195363 | 234365 | 137773 | 473148 |
| Employment rate | 37,3 | 32,7 | 47,4 | 33,7 | 62,3 | 41,6 | 32,3 | 25 | 33,3 |
| Gross value added in mil. EUR (total RM, in 2007 year) | 4948,5 | 386,5 | 320,5 | 343,8 | 483,2 | 554,5 | 349,7 | 210,2 | 2401,1 |
| Agriculture, hunting, forestry, fishing in mil. EUR (in 2007 year) | 542,3 | 57,6 | 46,5 | 27,7 | 160,1 | 118,7 | 59,1 | 34,7 | 38 |
| Gross domestic product in EUR/capita (in 2007 year) | 2834 | 2936,3 | 2076,3 | 1810,6 | 2604,6 | 2755,1 | 1313,6 | 1412,8 | 4733,9 |

*Source: Regions of the Republic of Macedonia, 2009.*

The region of Pelagonia has the greatest possibility for development (based on the volume of land facilities) while Skopje region has the lowest (see table 2). Pelagonia also has the largest amount of plot area for the production of tobacco while the regions of Skopje and Polog have small amount of it.

*Table 2 – Area by category of use in hectars (in 2008 year)*

| Indicators | Republic of Macedonia | Region | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Vardar | East | Southwest | Southeast | Pelagonia | Polog | Northeast | Skopje |
| Agricultural area | 1064389 | 108167 | 113625 | 103601 | 90973 | 268500 | 169526 | 145286 | 64711 |
| Cultivated land (total) | 521193 | 56464 | 79771 | 50893 | 57370 | 115314 | 44465 | 78749 | 38167 |
| Arable land and gardens | 423647 | 44232 | 66689 | 40599 | 48970 | 95879 | 31375 | 64540 | 31363 |

*Source: Regions of the Republic of Macedonia, 2009.*

The aim of this paper is to determine the regional distribution of area under tobacco. It also determines and compares the value of production and the structure of production costs only to the level of variable or direct costs. Furthermore, its aim is to

determine the gross margin and the cost of tobacco production in the family economies chosen by region.

## Data source and method of work

We are using published statistic details from the State Statistical Office of the Republic of Macedonia for five-year period (2005-2009) in order to determine the scope of areas and the tobacco production by regions. During 2009, we conducted a survey of 24 producers who produced tobacco in 2008 which means 3 surveys in each region. The choice of the municipality or the village was based on the participation in the total area under tobacco in the region. Namely, the municipality which has highest participation in the total area is the location where tobacco producers were surveyed (see Table 3).

*Table 3 – Municipalities that have a dominant participation in the total area and in the tobacco production by regions (average 2005-2009)*

| Region | Muncipaly | Area | | Production | | Yeld (kg/ha) |
|---|---|---|---|---|---|---|
| | | ha | Participation (%) | Tons | Participation (%) | |
| 1. Skopje | Studenichani | 157 | 68,2 | 222 | 74,75 | 1430 |
| 2. Northeast | Lipkovo | 58 | 57,1 | 85 | 61,59 | 1703 |
| 3. East | Vinica | 164 | 24,9 | 235 | 19,44 | 1401 |
| 4. Southeast | Radovish | 2299 | 35,5 | 2852 | 33,24 | 1239 |
| 5. Vardar | Veles | 534 | 43,1 | 765 | 47,19 | 1441 |
| 6. Pelagonia | Dolneni | 2845 | 32,4 | 3958 | 36,35 | 1380 |
| 7. Southwest | M. Brod | 32 | 30,1 | 14 | 17,28 | 356 |
| 8. Polog | Vrapchishte | 8 | 85,2 | 4 | 80,00 | 848 |

*Source: Our estimations based on the data from Statistical Review: Field Crops, Orchards and Vineyards, 2005-2009 year*

The value of obtained production is based on the quantity of offered tobacco for companies which purchase and process tobacco, including the prices and classes of purchased tobacco. The costs of production are determined on the basis of natural data from the surveys and the actual market prices by regions. In the process of converting domestic currency in EUR, the ratio which was used is 1EUR:61,18MKD in 2007, and 1EUR:61,27MKD in 2008.

## Results and discussion

### *1. Area and production of tobacco by regions*

In June 2007, a census of agriculture was conducted in the Republic of Macedonia. According to the results, 192.675 subjects work in primary agricultural production. 99,8% of them are individual family farms and 0,2% or 297 are so-called, business entitles. In the country, 33.000 households grew tobacco which is 6.4% of the total number of households (average 2005-2009). Unfortunately, we do not have any

accurate data about their dispersion by region. However, we do have accurate statistic data about the area, the production and the average yields of tobacco by region (see Table 4). In the Republic of Macedonia, there are 17.579 acres of land under tobacco which is almost 4% of the total area of arable land or 74% of the total area under industrial crops. Pelagonia and the Southeast region are the greatest producers of tobacco which cover 86,67% of the total area, or 85,29% of the total amount of tobacco.

*Table 4 – Participation of regions in the total area and in the production of tobacco in the Republic of Macedonia (average 2005-2009)*

| Region | Area | | Production | | Yeld (kg/ha) |
|---|---|---|---|---|---|
| | ha | Participation (%) | Tons | Participation (%) | |
| 1. Skopje | 230 | 1,31 | 297 | 1,30 | 1313 |
| 2. Northeast | 102 | 0,58 | 138 | 0,64 | 1337 |
| 3. East | 884 | 5,03 | 1209 | 5,30 | 1347 |
| 4. Southeast | 6473 | 36,81 | 8579 | 37,59 | 1323 |
| 5. Vardar | 1012 | 5,76 | 1621 | 7,10 | 1597 |
| 6. Pelagonia | 8767 | 49,86 | 10890 | 47,70 | 1242 |
| 7. Southwest | 106 | 0,61 | 81 | 0,35 | 785 |
| 8. Polog | 5 | 0,04 | 5 | 0,02 | 890 |
| Total, RM | 17579 | 100,00 | 22820 | 100,00 | 1315 |

*Source: Our estimations based on the data from Statistical Review: Field Crops, Orchards and Vineyards, 2005-2009 year*

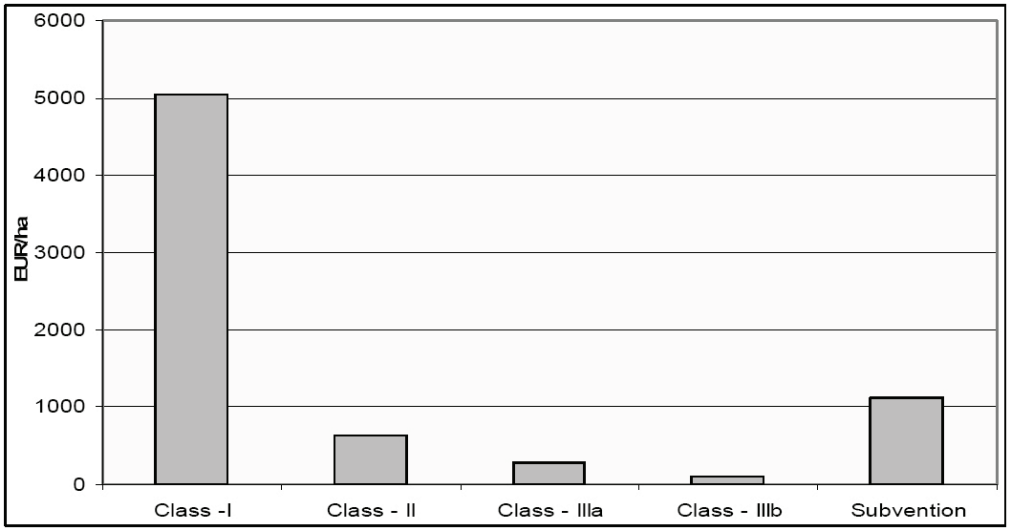
## *2. Gross margin and price of tobacco costs by regions*

Gross margin expresses the difference between the total income of production and the total number of variable costs. This method for measuring the efficiency of invested inputs has been used in the developed countries since the sixties. By using this method, the constant costs such as amortization are ignored because the usage of machinery is relatively the same for all producers.

The value of tobacco production is formed by several quality groups of production which are economically different in the process of valorization, i.e. have a different purchase price. Due to this fact, in striving to be achieved maximum average purchase price as well as higher income of classed tobacco, the producers are trying to produce tobacco of high class (I and II) and then realistically evaluate and classify the offered tobacco in the process of purchasing it.

The quantity and quality of the produced tobacco per unit area (hectare) depends on several groups of factors including: type, sort and their originality, soil and climate conditions, the applied technology of production, the intensity of investments, the organization of labor, the conditions and the way its kept until the purchase.

*Fig. 2 - Structure (average) of the total income*



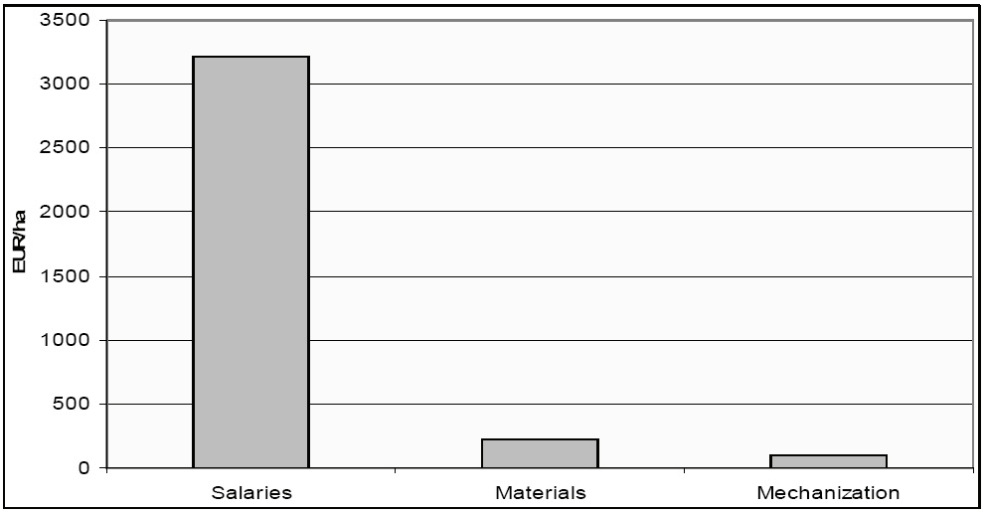

*Source: Our estimations*

The average amount of tobacco of the producers who were surveyed is 1.580,5 kg/ha with the following structure of quality: class I 73,7%, class II 12,8%, class IIIa 8,3% and class IIIb 5,2%. The best results of production had the producers of the region of Polog (average 9.034,3 EUR/ha), while the producers of the region of Skopje had the worst results of production (average 3.538 EUR/ha, see figure 2). The analysis of the total income (the value of production and subventions) shows that there is a relatively huge difference in the total amount of produced tobacco regardless of its quality. In the 2008, the subvention for tobacco was 0,73 EUR/kg per purchased tobacco.

There are many types of costs in the process of production but for this purpose, we classified them in three groups: salaries, materials and mechanization. The highest participation has the salary costs, i.e. the costs of human labor (see figure 3). This group of costs covers 84% of the average total direct costs (3.982, 3EUR/ha). The costs of materials, i.e. costs spent on protective equipment such as fertilizers, irrigation water, PVC foil, tobacco threads and suchlike cost 479,2 EUR/ha or 12,0% of the total costs.

The mechanization costs are the lowest which are spent on fuel and oil for lubrication of machinery. The average amount of these expenses is 157.3 EUR/ha or only 4.0% of the total costs. This is understandable because the tobacco is known for its labor intensity i.e. relatively high usage of human labor and on the other hand, slight involvement of mechanization in the process of production.

*Fig. 3 - Structure (average) of the variable costs*



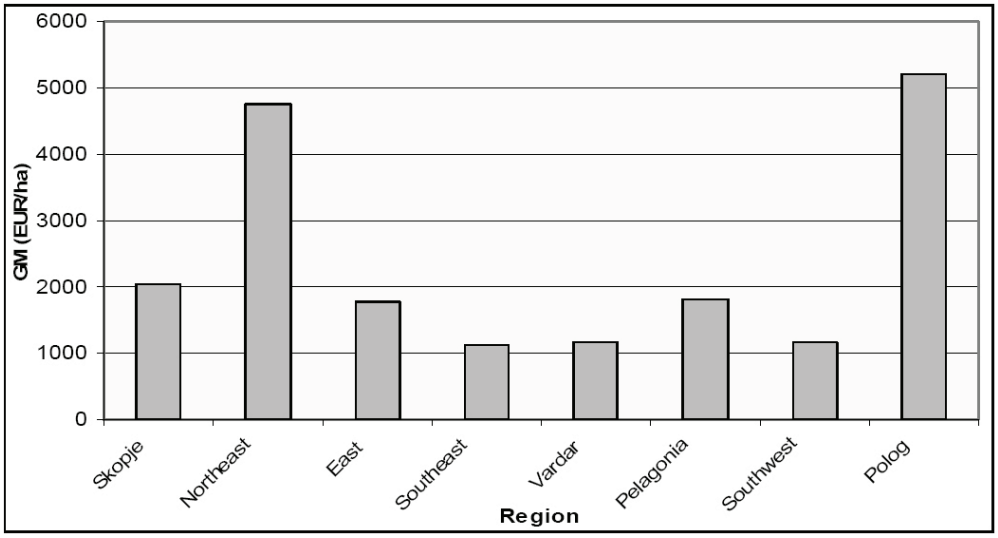

*Source: Our estimations*

The tobacco producers of the region of Skopje have the lowest variable costs (average 2.591,8 EUR/ha), primarily due to the relatively low usage of human labor. In this region, the cost of labor is averagely 2.095 hours per hectare which is 38,7% less than the average cost in the country. On the other hand, the region of Polog has the highest variable costs (more 30,6% than the average) due to the high share of salaries` costs. These cost are 28,1% higher than the average costs in the country. According to our research, the cost of labor is 3.243 hours/hectare, which is 2.6 times lower than the published results by Anakiev (1984) and 1.6 times less compared with the results by Ivanovski (1982).

In practice, the synthetic indicator for efficiency of the usage of human labor is measured by the level of labor productivity, i.e. by the ratio between the quantity of tobacco and the usage of human labor. The average productivity of labor is 0.60 kg/hour which is 4 times higher than the results of productivity published by Anakiev (1984) and 31% lower compared with the results by Ivanovski (1982).

As mentioned above, the efficiency of investment is measured by the amount of the costs of salaries, materials and machinery in terms of total income, i.e. according to the amount of gross margin. The lowest amount of gross margin (1.130,6 EUR/ha) is in the Northeast region which is 53,9% lower than the average total amount of gross margin. However, the producers of the region of Polog have the highest efficiency for investment. Averagely, they make 5.780,7 EUR/ha or 135,5% more than the average total amount of gross margin in the country.

*Fig. 4 – Comparative review of the gross margin in the tobacco production in the Republic of Macedonia*




*Source: Our estimations*

According to 24 producers of tobacco who were surveyed, the average amount of gross margin is 2.454 EUR/ha which is 48,2% of the average value of sold tobacco, or 38,1% of the average total income along with the subventions. Their amount of gross margin is 20,9 index units higher than the gross margin published by Pesevski (2001) and 27,8 index units higer than the published results by Usaleski (2002). The average amount of tobacco cost is 2,23 EUR/kg. Measured by regions, the cost varies from 1,70 EUR/kg in the Northeast region up to 2,65 EUR/kg in the Eastern region.

## Conclusion

Yields and the total production of tobacco vary by regions due to various natural and organizational-economic conditions for the production of aromatic tobacco.

There is a different value of production by regions due to the relatively different quality of tobacco produced by classes which have different price in the process of purchase.

Regardless of its quality, the Government of the Republic of Macedonia always pays the same amount of subvention for the produced tobacco unit.

There is a huge difference in the variable costs due to the relatively different level of investment of productive inputs.

Due to the huge difference in value, i.e. total income and total variable costs, the gross margin varies by regions.

There is a relatively huge difference even in the price of costs by regions because of the differences in the realized production (yield) and the variable costs.

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Economics of agriculture
SI – 2
UDK: 633.11:631.84

# IMPACT OF NITROGEN FERTILISATION ON THE ECONOMIC EFFICIENCY OF WINTER WHEAT YIELD

*Marjeta PINTAR[1], Barbara ZAGORC[2]*

## Abstract

*The economic efficiency of winter wheat production with regard to nitrogen (N) fertilisation was studied on the results of experiment with the fertilisation of winter wheat variety Žitarka. In the experiment it was found out how different fertilisation treatments of N sidedressing (different total quantity, number of sidedressing and the target value at the first sidedressing) affect the yield quantity and the parameters of wheat quality. Economic analysis was used to establish the fact that different fertilisation treatments of wheat with N influenced significantly the economics of wheat production. Economically the most efficient sidederssing in the studied conditions was that with the total sidedressing up to 210 kg N/ ha – Nmin applied in three rates, and that with the target value of 120 kg N/ha at the first sidedressing.*

***Key words****: winter wheat, N fertilisation, grain quality, economic efficiency*

## Introduction

The supply of winter wheat crop with nitrogen (N) during the growing period is one of the key factors influencing the economy of wheat production through the yield and grain quality obtained. Numerous authors (Tomasović, 1990; Leskošek, 1994a, b; Pechanek et al., 1997, Sušin and Zemljič, 2002, Garrido-Lestache et al., 2004) report on sidedressing of wheat with N which significantly affects the abundance of crop, the rapidity of growth, the size and number of ears and grains, and some indicators of yield quality (the content of crude protein, sedimentation value, test weight).

Winter wheat is sidedressed with N at three dates. While some authors (Tomasović, 1990, Pechanek et al., 1997) have found out that the third sidedressing does not contribute to a statistically significant increase of yield, Briški (1994) and Leskovšek (1994a, b) reported that it

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increases both the yield and the content of crude protein in grain. The previous experiments and researches carried out in Slovenia tried to find out optimum rates of N in three sidedressings and the relation between fertilising rates of N and grain quality.

Wheat protein content is influenced by environment, cultivar, N fertiliser rate, timing and method of N application, and the interactions between these factors. Farmers producing wheat face a challenge in making N fertilisation decisions because of the influence of fertilisation rates on yield and on protein concentration, and the influence of protein on wheat price. Protein is valued because it influences the suitability of the grain in making bread. The purchase price of wheat in the world and in Slovenia is determined with regard to quality parameters (table 1).

*Table 1: Parameters of quality for wheat in Slovenia*

| | Quality classes | | |
|---|---|---|---|
| | A | B | C |
| Crude protein (%) | 14 | 12 | 10,3 |
| Test weight (kg/100 l) | 78 | 76 | 74 |
| Falling number (FN) | 280 | 250 | 220 |
| Sedimentation | 45 | 35 | 30 |

*Source: Zemljič and Ileršič, 2008*

Since both yield and protein affect profit, economically motivated growers will desire to apply N fertiliser at rates that maximize profit considering both yield and protein (Karuaihe in Young, 2005).

Only few studies investigated the crop quality response to applied N fertiliser and its economic consequences. Baker et al. (2004) determined profit-maximizing N fertiliser levels for hard red spring wheat for various wheat prices, N prices, and protein based price premium/ discount structures. An empirical model to examine economically optimal N fertiliser rates for winter wheat when N affects crop yield and crop price was presented by Gandorfer and Rajsic (2008).

Tanjšek and Tanjšek (2004) investigated the impact of mineral N fertilisation on the baking quality of wheat and on the intervention price. They found out that fertilisation with mineral N affected significantly the improvement of grain quality and the height of intervention price.

The purpose of our investigation was to establish the influence of N fertilisation through the yield and quality parameters (crude protein and sedimentation) on the economic efficiency of winter wheat produced by market producers.

## Materials and methods

The current paper presents an economical evaluation of the results obtained in the experiment (Zemljič and Sušin, 2000) in which the influence of N fertilisation (KAN) on the yield and quality of winter wheat was studied. The experiment mentioned above was conducted in the regions of Prekmurje (the variety Žitarka) and Dolenjska (the variety Profit) in 1999. Among the quality parameters, crude protein and sedimentation value were analysed; those are two of the quality parameters (Zemljič and Ileršič, 2008)

influencing the classification of wheat yield in quality classes and, consequently, the height of purchase price for wheat. The classification of treatments into A, B and C quality classes (table 1) was carried out at a following presumption: if the wheat quality with regard to the two quality parameters, crude protein and sedimentation, was suitable for the classification in individual quality classes, the two parameters, falling number and test weight, are suitable, too.

*Table 2: Yield and parameters of grain quality for wheat variety Žitarka*

| T | Yield (t/ha) | P (%) | SE | N (kg/ha) | Fertilisation dose (kg N/ha) | | | S | QC |
|---|---|---|---|---|---|---|---|---|---|
| | 14 % moisture | | | | 1 spreading phase | 2 stem elongation | 3 ear emergence | | |
| 1 | 3,0 | 10,47 | 30 | 23 (Nmin) | - | - | - | 0 | C |
| 2 | 4,7 | 10,69 | 30 | 80 | 80 - Nmin | - | - | 1 | C |
| 3 | 5,8 | 10,76 | 30 | 120 | 120 - Nmin | - | - | 1 | C |
| 4 | 5,9 | 11,19 | 41 | 160 | 160 - Nmin | - | - | 1 | C |
| 5 | 6,8 | 12,55 | 43 | 170 | 120 - Nmin | 50 | - | 2 | B |
| 6 | 6,5 | 13,10 | 42 | 210 | 160 - Nmin | 50 | - | 2 | B |
| 7 | 7,0 | 14,16 | 50 | 210 | 120 - Nmin | 50 | 40 | 3 | A |
| 8 | 6,0 | 13,29 | 45 | 170 | 80 - Nmin | 50 | 40 | 3 | B |

** In the autumn the experiment was fertilised with 450 kg of NPK 7:20:30.*
*Source: Zemljič and Sušin, 2000*
*T: Treatment; N: Total target value of N = Nmin (0-90 cm) at first sidedressing (23 kg N/ha) + fertilisation dose of N; SE: Sedimentation; P: Crude protein; S: Number of sidedressings*
*QC: Quality class*

The costs of wheat production were evaluated as a model using the model calculations made by Agricultural Institute of Slovenia (AIS) with general basic positions and presumptions built in (Rednak, 1998, Splošna metodološka izhodišča …, 2010). The calculation for wheat was used as basic model (Zbirnik rastlinskih kalkulacij, Modelna kalkulacija za pšenico, 2010) which was modified and supplemented to meet the requirements of the research. After a preliminary short analysis of results obtained in the experiment we decided to present only the results for the variety Žitarka in the current paper. With regard to the results of fertilisation experiment (table 2) in individual treatments we varied the total target value N, the target value N at the first sidedressing, the number of sidedressings and quality class of yield. In the calculation we used the input prices valid for the 2010 yield from data bases at AIS. On revenue side we considered the purchase prices of wheat which were offered by purchasers after the harvest of summer 2010 (quality class A= 135 EUR/t, quality class B= 125 EUR/t and quality class C= 110 EUR/t) and budget support (regional payment for fields and repayment of excise duty) to which the wheat producers in Slovenia are entitled in 2010. Using model estimations we calculated the economic indicators with which we want to illustrate the economic efficiency of wheat production with regard to fertilisation with N.

**Costs per product unit reduced by subsidies (LC):**
LC (EUR/kg) = (MC + AM + DW + CC - SC - SUB)/ Y

MC (EUR/ha) = material and services bought (fertilisers, plant protection, seeds, hired machinery services, insurance, fuel, maintenance of machinery…);
AM (EUR/ha) = amortization (assets, machines) ;
DW (EUR/ha) = domestic work and obligations arising from work (net salary, contribution for health and pension insurance, taxes);
CC (EUR/ha) = capital costs;
SC (EUR/ha) = by-product = straw (costs of straw harvest);
SUB (EUR/ha) = subsidies (regional payment for fields and repayment of excise duty);
Y (kg/ha) = principal yield;

**Revenue (R):**
R (EUR/ha) = yield (kg/ha) * purchase price (EUR/kg) + SUB (EUR/ha)
**Net value added (NVA):** NVA (EUR/ha) = R – MC – AM
**Net value added per hour of work invested (NVAH):**
NVAH (EUR/h) = NVA/H
H = number hours of work invested

## Results and discussion

The economic analysis of results obtained in the experiment has shown that the total target value of N, the number of sidedressings and the target value at the first sidedressing influence significantly the economic results of wheat production.

From the results presented in table 3 it is evident that the revenue (R) and net value added (NVA) per hectare are the highest in the treatment 7 while the production costs per unit of product reduced by subsidies (LC) are the lowest in the treatment 5. It turned out that similar to yield the economic results were the best at the fertilisation up to target value of 120 kg N/ha at the first sidedressing (treatments 7 and 5).

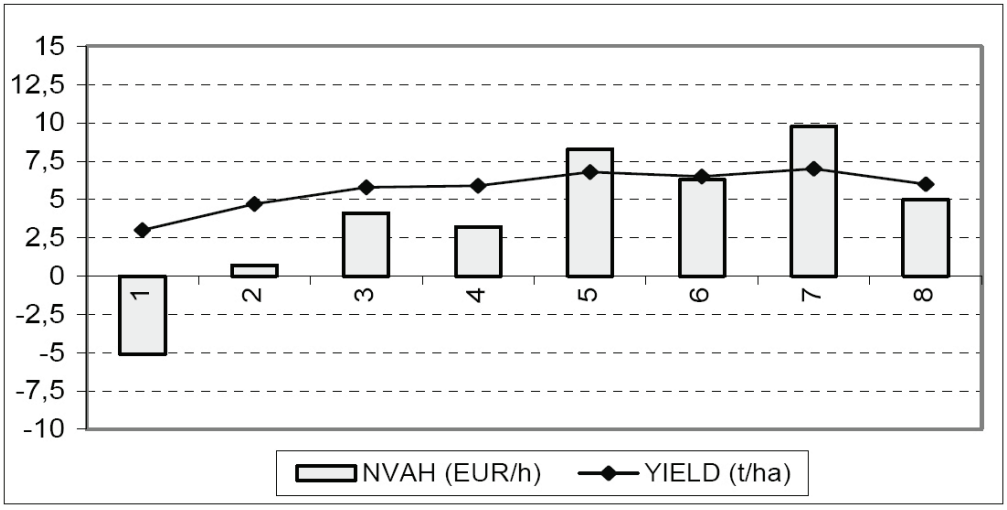
*Table 3: Quantity and quality of yield and economic results for winter wheat production variety Žitarka, with regard to different fertilisation treatments*

| O | Yield (t/ha) 14 % moisture | N (kg/ha) | S | QC | LC (EUR/kg) | R (EUR/ha) | NVA (EUR/ha) | NVAH (EUR/kg) |
|---|---|---|---|---|---|---|---|---|
| 1 | 3,0 | 23 | 0 | C | 0,230 | 800 | -99 | -5,1 |
| 2 | 4,7 | 80 | 1 | C | 0,172 | 1.052 | 17 | 0,7 |
| 3 | 5,8 | 120 | 1 | C | 0,147 | 1.223 | 109 | 4,1 |
| 4 | 5,9 | 160 | 1 | C | 0,151 | 1.233 | 84 | 3,2 |
| 5 | 6,8 | 170 | 2 | B | 0,141 | 1.465 | 250 | 8,3 |
| 6 | 6,5 | 210 | 2 | B | 0,151 | 1.425 | 188 | 6,3 |
| 7 | 7,0 | 210 | 3 | A | 0,145 | 1.570 | 306 | 9,8 |
| 8 | 6,0 | 170 | 3 | B | 0,160 | 1.340 | 149 | 5,0 |

The production costs per unit of product were the lowest at the treatment 5 when two sidedressings with the total target value of 170 kg N/ha-Nmin were applied while sidedressing up to the total target value of 210 kg N/ha-Nmin (treatment 7; third sidedressing during the earing added) have caused a certain increase of production costs (2 %). The yield has increased due to higher quantity of N added; however, the influence on the increase of yield was poorer than additional costs of the third sidedressing. On the other hand, additional sidedressing improved the grain quality (higher share of crude protein and better sedimentation) which was then classified in the quality class A. Revenue from selling the A quality class wheat (7.0 t/ha yield) was by 7 % higher than that from selling the B quality class (6.8 t/ha), which had an impact on better production economy in the case of additional third sidedressing (+ 40 kg N/ha).

The results have also shown that a too small N dose at the first sidedressing (80-Nmin) negatively influences the yield size, which can not be compensated by the second and the third sidedressing (comparison between the treatment 5 and 8).

*Figure 1: Impact of different fertilisation treatments on yield and net value added for winter wheat production variety Žitarka*




Additional third sidedressing (treatment 8) improved the grain quality to a certain degree, but in spite of that it did not reach the quality of the class A. Due to additional third sidedressing the costs of wheat production were higher, which, beside the lower yield, had an additional effect on poorer economic results in the treatment 8 (by 40 % lower income per one hour of invested work than in the treatment 5). In case of a too low chosen target value of N at the first sidedressing (80-Nmin), additional third sidedressing has proved as uneconomical as it had increased the production costs additionally (+13 %) and did not contribute to a sufficient increase of quality parameters.

A too large dose of N at the first sidedressing (160-Nmin) also negatively influences the height of yield (higher risk of lodging). From the comparison of

treatments 6 (160-Nmin) and 5 (120-Nmin) it is evident that in spite of the 40 kg higher quantity of the total N added in the treatment 6, the wheat yield was lower than in the treatment 5, and the grain quality was similar and suited the quality class B. Due to higher quantity of N added the wheat production costs in treatment 6 were by 7 % higher than in treatment 5 while the income per one hour of invested work in the case of a too high chosen target value at the first sidedressing was by one quarter lower than at a properly chosen target value (120 kg N/ha-Nmin) and lower total quantity of N added (treatment 5).

On the other hand, the comparison of the effect of wheat fertilisation (treatments 6 and 7) with the same total target value of N (210 kg N/ha), but different target values at the first sidedressing and different number of sidedressings, indicates that at a properly chosen target value at the first sidedressing (120-Nmin) and three sidedressings, the yield was higher by 500 kg/ha, the quality was better (quality class A), and the economy of wheat production improved significantly as well.

## Conclusions

The economic analysis of the results obtained in the experiment with N sidedressing of wheat has shown that the total target value of N, the number of sidedressings and the target value of N at the first sidedressing significantly affect the economic results of wheat production. Increasing the total target value of N improves the economy of wheat production (treatments 1, 2, 3 and 7), since the income per hectare and the income per one hour of invested work increase, too. Beside by the total target value of N, the economy of production is also significantly influenced by target value at the first sidedressing. First sidedressing to target value 160 kg/ha may have an effect on the poorer economic efficiency of wheat production (treatment 4 and 6), since additional quantity of N at the first sideressing does not affect the increase of yield quantity and quality to an extent to be able to cover additional production costs by the value of yield. A too low target value at the first sidedressing (treatment 8) in the studied conditions did not suffice to reach the maximum yields. Also, the introduction of the third sidedressing did not improve the grain quality to an extent (same quality class) to cover a bit lower yield and additional costs of the third sidedressing. In the current experiment with the variety Žitarka sidedessing up to the total target value of 210 kg N/ha -Nmin carried out in three rates and the target value of 120 kg N/ha at the first sidedressing has proved as economically the most well-founded. In order to reach maximum economic efficiency in wheat production it is therefore very important to know the technological requirements of individual varieties which ensure reaching optimum yields of a proper quality.

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Economics of agriculture
SI – 2
UDK: 636.4:637.07

# PRESENT AND FUTURE FOR INFORMATION SYSTEM FOR MONITORING TRACEABILITY IN PORK MEAT SUPPLY CHAIN

*Liana Anica-Popa, Mirela Stoian*[1]

## Abstract

*In the current context of increasing requirements regarding food safety and security and of rapid changes from business environment, the role of information systems for monitoring traceability is in a continuously increase of importance. In order to fulfill the national standards and regulation regarding traceability and the business requirements, it is necessary to be used the most recent development from information technology and communication (IT&C). The data and information provided by information systems must be organized in order to allow a quick extraction and processing for fulfilling the organizations objectives.*
***Key words**: traceability system, information systems, pork meat supply chain, food safety*

## Introduction

The agro-food economy is focusing to provide a responsive fulfillment of end-consumer demands regarding quality, safety and security of food and foodstuff.

In the European Union (EU) food-safety and food-quality represent one of the most important concerns, consequently, a set of rules and regulation were adopted in order to ensure the highest possible level of human life and health, taking into consideration protection of animal health and welfare, plant health and the environment.

In the Regulation (EC) No 178/2002 of the European Parliament and of the Council it is specified that **food** (or **foodstuff**) represents "*any substance or product, whether processed, partially processed or unprocessed, intended to be, or reasonably expected to be ingested by humans*", including "*drink, chewing gum and any substance, including water, intentionally incorporated into the food during its manufacture, preparation or treatment*" and that **traceability** represents "*the ability to trace and follow a food, feed, food-producing animal or substance intended to be, or expected to be incorporated into a food or feed, through all stages of production, processing and distribution*".

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## Information system for monitoring traceability in pork meat supply chain

The designing, development and deployment of an information system for monitoring the traceability in pork meat supply chain are a very complex process which implies more stages. In the first stage it is necessary to be defined and established the main objectives of the information system, followed by the study of the national and international legislative framework regarding the traceability and the monitoring the traceability in pork meat supply chain. The next stage implies the study of the current information system, focused on the documents workflows and the identification of the possible way for harmonization these workflows with the national standards regarding the monitoring of traceability.

The main objectives of an information system for monitoring the traceability in pork meat supply chain are:

- Protecting and improving the health of animals through a more careful monitoring of the animals' evolution accordingly with the national and international regulations and standards (for example, accordingly with the standards of World Organization for Animal Health - OIE[2]).
- Improving the identification of preventive measures which must be adopted in some situations (for example, in the case of identification of animal which has suspect symptoms or symptoms of a disease etc.) in order to maintain under control and, in the same time, for blocking the spreading of the disease.
- Monitoring the animals which are for human consume (by industrial processing followed by commercialization) and the animals which will be sold "live" both to the national companies or to the foreign companies (by the export process).
- The modularity and the adaptability in order to develop new features and the compatibility with other systems (national or international) in order to increase the trust and to provide the transparency in national or international business relationships.

One of the most important regulations from EU regarding pork traceability is Council Directive 92/102/EEC regarding the marking the pigs using ear-tags or tattoos. The marking must allows the exact identification of the place of origin and all documents regarding an animal. In the same time, it is recommending to build and develop a national database in which must be stored information regarding the specified marks for each animal. The operation of replacing or removing the mark can be done only with a special approval from competent institutions and if the original mark is

2 In 1924, the signing, by 28 countries, of an international agreement represents the starting point of creating the Office International des Epizooties (OIE) with headquarters in Paris. In 2003 the Office International des Epizooties was transformed into the World Organization for Animal Health, but the acronym remains OIE. The total number of OIE members is 174.

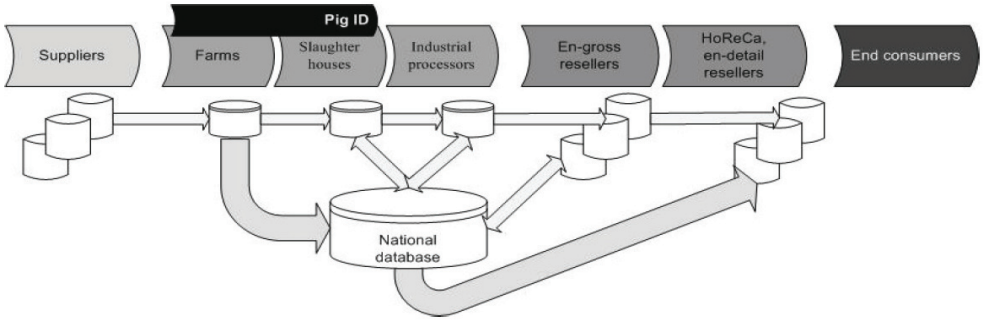
changed it is necessary to be recorded all information in order to be obtained an exact connection between the marks applied to the same animal.

The information systems must allows an explicit and complete records for all livestock movements from a farm[3], and if the animals are moved to/from market or to/from collecting point, the information system must provide/gather the information from documents that identify all animals that are in that batch of animal.

In the same time, the information system must provide information which can be included in a national system for monitoring in order to be realized a complete trace of each animal from birth till the slaughtering and industrial processing.

For the pigs' livestock movements between EU countries it is necessary that the batch of animals to have a health certificate issued accordingly with EU regulations regarding the health problems which can affect the intra-Community trade with bovine or swine (Council Directive 64/432/EEC). The health certificate must contain a minimal set of information for each animal that belongs to the moved batch of animals[4].

*Figure 1 - The main actors involved in informational workflow for monitoring the traceability in pork meat supply chain*




In Figure 1 are presented the main actors from the information flow for monitoring the traceability in pork meat supply chain and principles of exchanging data between them:

- In the databases that belong to the farms are included relevant information from the suppliers' databases (supplier of fodder, medicines etc.).
- Some relevant data stored in farms' databases are included in a national database.
- In the databases belonging to the slaughter houses and industrial processors are included relevant information from the farms' databases.
- Some relevant data stored in databases of slaughter houses and industrial processors are included in a national database.

3 It is necessary to be stored the total number of animals and other specific information for each input or output operation at the farm level.

4 The exact identification of each animal will be based on unique identification number (established using ear-tags or tattoos)

- ❖ In the databases that belong to the en-gross resellers are included relevant information from databases of slaughter houses and industrial processors.
- ❖ Some relevant data stored in databases of en-gross resellers are included in a national database.
- ❖ In the databases that belong to the hotels, restaurant and catering (HoReCa) or en-detail reseller are included relevant information from the en-gross resellers' databases.
- ❖ The databases of HoReCa and en-detail reseller can access the national database in order to include relevant information from the point of view of final-consumer.

## Conclusions

The process of monitoring traceability in pork meat supply chain cannot be implemented in the absence of an integration based on a vertical approach of information. Taking this into consideration, it is necessary to have a rigorously planning for the following characteristics of a traceability system:

- Compatibility.
- Standardized information.

The designing, development and deployment of information system for monitoring traceability in pork meat supply chain will help to ensure better product safety and better product quality.

## Acknowledgement

This work was financed from the Modernizing Agricultural Knowledge and Information Systems (MAKIS) program; project number 141.921/2008 „Designing an information system for monitoring the traceability in pork meat supply chain".

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Economics of agriculture
SI – 2
UDK: 339.13:637.1 (497.11)

# COMPETITIVENESS OF MILK PROCESSING INDUSTRY IN SERBIA

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## Abstract

*In paper was examined competitiveness of bigger and middle sized dairies. It is concluded that dairies in Serbia had improved competitiveness over last five years. Export value, as well as value of net trade of dairy products increased over period. Dairy plant's labour productivity in Serbia is lower than average labour productivity of dairies in EU. The biggest dairy plants perform higher levels of productivity than middle sized dairy plants. Efficiency of labour cost is on average higher in case of middle sized dairies, because of significantly lower average labour cost per employee.*
***Key words:*** *competitiveness, productivity, costs, dairy plants, Serbia*

## Introduction

Milk supply chain is consisted from several segments: input industry, dairy farms, milk processing industry, wholesale, retail chains and food service. Competitiveness of each segment is equally important for competitiveness of all dairy supply chain. In focus of this paper is competitiveness of dairy plants.

Milk processing in Serbia exists on two parallel market segments. Formal milk market includes milk processed in dairy companies, while non formal market includes milk processed and sold by farmers. Formal milk market has been continually developing and in 2009 reached share of 65% of the total produced raw milk intended for human consumption (Popovic, Knezevic, 2010). Rest of 35% produced milk is used partly for farm family needs and bigger share is processing and distributing to consumers. Milk processing is done by 186 dairy companies which structure could be roughly divided in 3 groups. The first group are big dairy companies (5) that process over 28 million litres of milk per year, the second group consist medium sized dairy companies (73) that process from 1 to 28 million litres per year and the last group are

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micro dairy companies (108) with an annual processing of milk less than 1 million litres. Their shares in the total amount of milk processing are respectively: 60, 34 and 6%. Dairy industry employs 9% of the total employees in the food industry, and contributed with share of 6.4% in creation positive trade balance of agriculture and food industry in 2009.

Fundaments of measuring competitiveness, based on absolute differences in costs of production between different countries, originated by Adam Smith's theory of trade from 18th century. From that time new trade theories incorporated different aspects in analysis of competitiveness, such as differentiation, innovation or economies of scale (Wijnands et al. 2007).

As Zawalinska (2005) stated, citing many authors, there is at list five dimensions of competitiveness. They are: wade range of possible applications (from farm to state level), potential (ex-ante) or revealed (ex-post), originated ruts from diverse theories, temporal approach (short-run, long-run) and relative term of application (internal and external competitiveness).

In earlier studies, because of lack of single measure of competitiveness, the most used indicators as determinants of competitiveness until now were: cost of production, profitability, efficiency, factor productivity and market share. Citing other authors Jeffrey and Grant (2001) conclude that producer efficiency and its relationship with production costs is a more appropriate measure of competitiveness than simply comparing average total costs of production. Because of multidimensional approach, there is no single theory of competitiveness. In practice researchers usually combine few indicators to assess competitiveness.

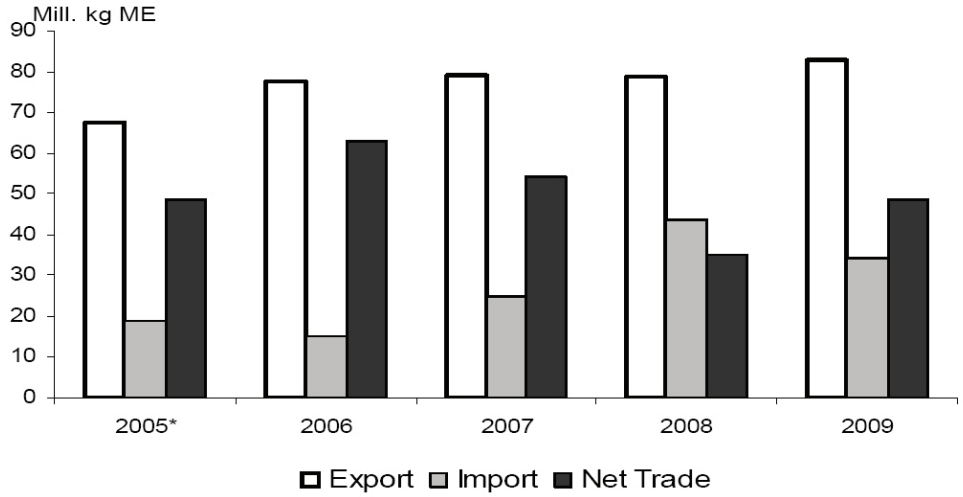
## Material and methods

The financial data of elements of the competitiveness of dairy plants in Serbia used in the research have been taken from the financial statements of companies published in data base of Serbian Business Registers Agency. Data on dairy processing capacities have been taken from the Ministry of Agriculture, Forestry and Water Management, conducted semi-structured questionnaires and interviews with employees in the management of sampled dairy plants. The sample was consisted of five large dairy plants and nine medium sized dairy plants. There were also used data from the Statistical Office of the Republic of Serbia and data from Eurostat. Competitiveness was measured with three indicators for the period 2005–2009, depending of data availability. It was examined the growth of external net trade of dairy products Republic of Serbia, partial technical and economic efficiency in bigger and middle sized dairy plants.

## Results

Serbia had positive external net trade with dairy products measured in milk equivalents[2] (ME) and in terms of value over last five years (Figure 1 and 2). Data in following figure shows that export of dairy products measured in ME had positive trend. But, at same time amount of imported dairy products increased faster, what resulted in decrease of net trade by the rate of -5.7%.

*Figure 1. Serbia external trade in dairy products, in period 2005 to 2009*

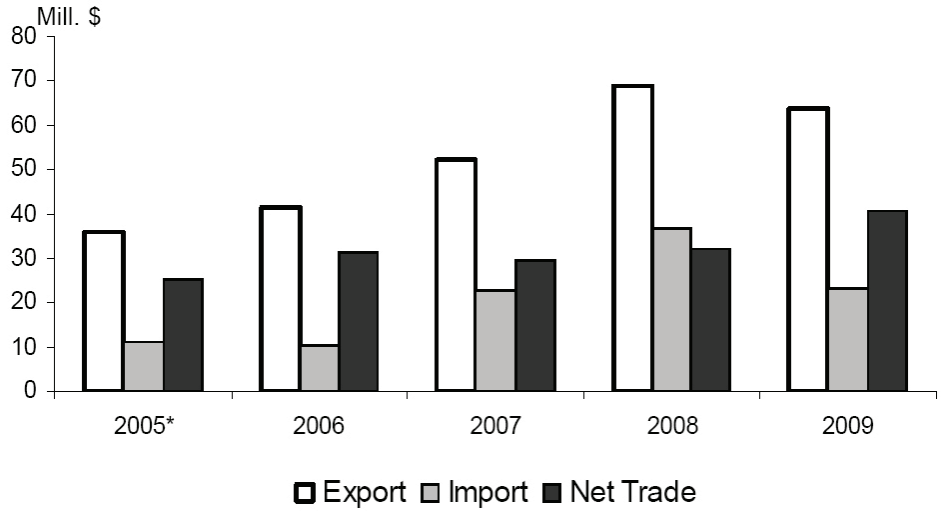



** Estimate was maid for export and import with Republic Montenegro in 2005*

Value of dairy products net trade is increasing over period by the rate of 10.5%. The highest value of net trade, 40.7 million $ was reached in 2009. This achievement wasn't result of export increase as much as of import decrease. As consequence of economic crisis consumers oriented more on cheaper imported dairy products.

2 Method solids fat and protein only, was used to calculate dairy products in external trade on common unit – milk equivalent.

*Figure 2. Value of external trade in dairy products, in period 2005-2009*




** Estimate was maid for external trade with Republic Montenegro in 2005.*

Serbia export dairy products mainly to few countries in the region. Majority of milk products, counted in value, are exported in Montenegro, with share of 61% in 2009. Value of exported dairy products in Bosnia and Herzegovina in same year had share of 24% and in Macedonia 11%. The most important export products were by value are: UHT milk, cheese, ice cream and yoghurts, with total share over 90%.

On import side about 70% values of all imported dairy products are coming from EU countries (Germany, Czech Republic, Republic of Slovakia, Poland, and France). Dairy products are imported also from countries in region, Bosnia and Herzegovina and Croatia. In terms of value the most important imported products are: SMP, WMP, whey powder, hard cheese, fermented milk products and UHT milk. Those products are participating with 81% in value of total dairy import.

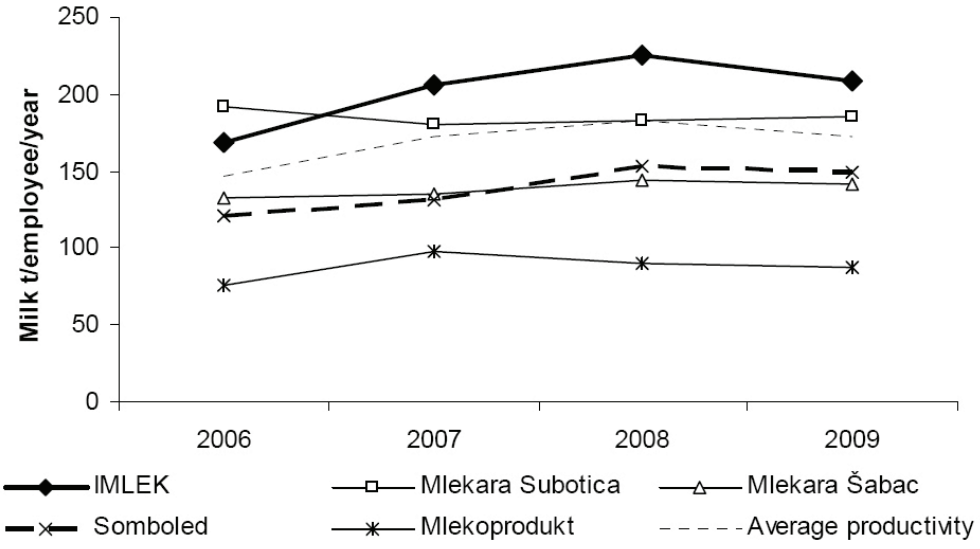
In Table 1 are presented data for unit values of dairy products in export and import in US $. Unit value is term used as indicator of price and quality aspects of products in external trade. Calculated unit values reveal that Serbia export cheaper dairy products with lower value added. On other side dairy products with higher quality and value added were imported. Some examples are hard and blue-veined cheeses, which are not producing on domestic market. Excluding data for 2007 and 2009, were prices of dairy products on world market reached very high level, it is possible to infer that price ratios of dairy products in export and import were closer to value 1 in 2009, than in previous years. In other words, dairy industry in Serbia exported dairy products with higher added value in 2009 than in previous years.

*Table 1. Unit value of dairy products in export and import in period 2005 to 2009*

| Year | Unit value (USD/litre ME) | | Price ratio | Net trade (in ME) share in Total production |
|---|---|---|---|---|
| | Export | Import | | |
| 2005 | 0,89 | 1,45 | 0,62 | 3,04% |
| 2006 | 0,99 | 1,57 | 0,63 | 3,96% |
| 2007 | 1,14 | 2,20 | 0,52 | 3,50% |
| 2008 | 1,56 | 2,77 | 0,56 | 2,28% |
| 2009 | 1,25 | 1,44 | 0,87 | 3,28% |

During the period 2006-2009 there was a general trend of labour productivity growth of the largest dairy plants in Serbia (Figure 3).

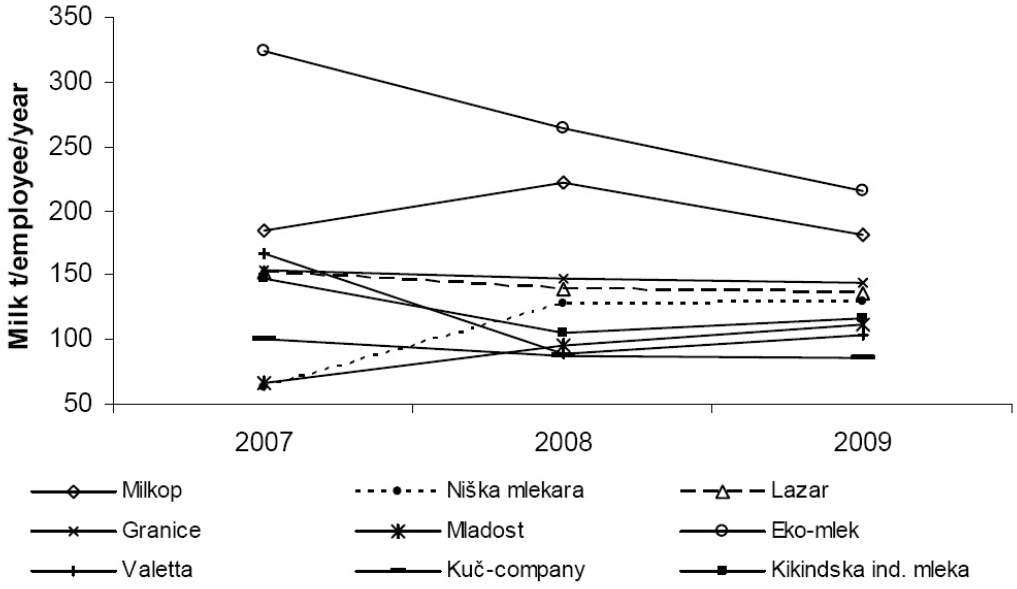
*Figure 3. Labour productivity of biggest dairies in period 2006-2009*




The highest level of productivity among biggest dairies was reached by Imlek. In the period 2006-2009 only Mlekara Subotica didn't show the growth of labour productivity, but it has held stable above average level of productivity. Dairy plant Mlekoprodukt with its production structure, which is focused on cheese production, is significantly different from 4 others large dairy plants, and with lower technology level, performed lower level of productivity. Weighted average productivity level of five dairy plants was 172.5 tons per worker in 2009. That is slightly lower level than those achieved in the previous year 183.7 tons per worker. At the same time the average productivity of dairy plants in the EU countries was 337.5 tons per worker (Eurostat, 2009).

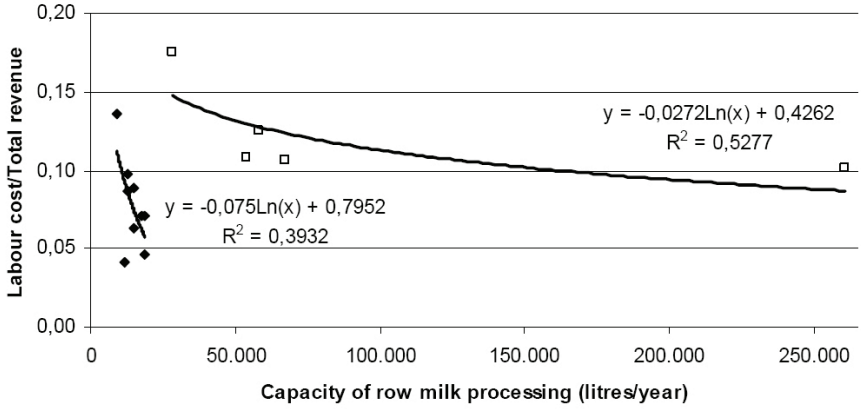
Although labour productivity of middle sized dairies is in average at a lower level, comparing with big dairy plants, it had positive trend over time and reached 129.5 tones of processed milk per worker in 2009 (Figure 4).

*Figure 4. Labour productivity of middle sized dairies, in period 2007-2009*




Economic efficiency of milk processing can be measured with cost efficiency which represents the share of the costs of certain inputs, or total costs in revenue. Assessing the cost (economic) efficiency, the rule applied is, the lower coefficient of costs share the greater is economic efficiency of analized economic entity. When analyzing the economic efficiency of dairy plants, as a measure of efficiency it has been considered the share of labor costs in total revenue. The results shown in Figure 5 indicate that the cost efficiency of observed dairy plants had ranged from 0.04 to 0.18 in 2009. The medium sized dairy plants reached lower coefficient of cost efficiency that is higher level of economic efficiency. The reason why this group of dairy plants have higher economic efficiency and at the same time lower level of productivity should be looked in the levels of average labor costs. Weighted average cost of medium-sized dairy plants was 61% lower than the same category for large dairy plants. It contributes the location of medium sized dairies, which operate mostly in rural areas. In the both groups of dairy plants, with the growth of processing capacity the coefficients of cost efficiency tend to decrease.

*Figure 5. Labour cost control ratios for 5 the biggest and 9 middle sized dairies in 2009*




## Conclusions

Indicators of competitiveness were examined in case of five the biggest and 9 middle sized dairies. Its total share on formal milk market was 73.5%. Dairy industry in Serbia increased export by the value and by quantity in period 2005-2009. Also, it is identified trend of growing export of dairy products with higher value added. Labour productivity of dairy plants generally has improved during 2006-2009, but it is still lower than in EU. Bigger dairies performed higher average productivity comparing with middle sized dairies. But, two middle sized dairies also achieved higher productivity. Thanks to significantly lower average labour cost per employee middle sized dairies achieved in average higher economic efficiency, measured with labour cost efficiency. It can be concluded that Serbian dairy plants improved competitiveness over last five years. They increased export of diversified milk products with higher added value, as well as increased labour productivity. In both groups of dairies it was identified trend of improvement labour cost efficiency by increase of capacities.

## Acknowledgement

This study was conducted within a project of Ministry for Science and Technological Development of the Republic of Serbia, no. TR-20008A.

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UDK: 631.67:631 (497.11)

# THE IRRIGATION INFLUENCE ON AGRICULTURAL INTENSIFICATION IN SERBIA

*Potkonjak Svetlana,[1] Zoranović Tihomir[1], Mačkić Ksenija[1]*

## Abstract

*The factors that influence on the intensification of agriculture on our estates (internal and external) are analyzed. Depending on the level of development and measures of agricultural policy, intensification process can be encouraged on many ways. In our case, the influence of constructing regional hydrosystem to increase the intensity (of production and economic effects) was investigated. Depending on the size of the hydrosystem, the volume of invested funds, as well as suggestions about possible restruction of the production, doubling of the economic and production effects can be achieved, on the condition that production management is in function of achieving our objectives. Realistically, in this case, the regional hydrosystem should be holders of intensification. They initiate the development of manufacturing industry and provide more quality goods for processing and market. Besides positive effects (direct and indirect) impact of irrigation on intensification, during long-term use on the same land, some negative effects were noticed (soil salinization, deterioration of water quality, irrigation erosion).*

***Key words***: *irrigation, regional hydrosystem, production and economic effects*

## Introduction

The effect of irrigation on the primary production on agricultural estates in Serbia, especially in regions with the built up or planned hydro system is reflected in several ways. So far, numerous studies were conducted both in our country and other countries. They included new criteria for evaluation in determining the level of intensity. Numerous product models that help farms to improve economic performance were developed. It is believed that mechanization, use of mineral fertilizers and plant protection contributed most to the intensification of agriculture (FAO, Rome, 2005).

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Intensification in agriculture is most often associated with land use. According to surveys (Bosnjak D, Rodic V., 2010.) In Serbia, in the period 1996-2005, over 60% of arable land was covered by grain, industrial crops over 10%, vegetables by 8% and forage crops over 14% which indicate extensive use. Countries that want to improve their agriculture develop different scenarios. Thus, for example, in Brazil (Goulart FF at all, 2008.) was developed a simulation model which has 21 levels of intensity. Inclusion of irrigation in the production process is on the eighth level.

Intensification causes changes in agriculture. There are direct and indirect effects of intensification (Harms WB, at all, 1997). They are manifested in three ways: as a biotic component of ecosystems, anthropogenic elements of spatial development and as a visual spatial aspect of spatial development. The effects of irrigation (production and economic) were assessed on an area of 100,000 ha, which is within the DTD Hs (S. Potkonjak, Zoranović T., Mackic K, 2006). At the same time, it has been stated that for this development strategy is necessary to make additional investments in mechanization, irrigation and animal husbandry. Realization of this project would, in any case, contribute to increase of the intensiveness of agricultural production.

In regard to the further development of agriculture in Serbia and the importance given to building regional hydrosystem, the impact of building them on the intensification of agriculture was studied.

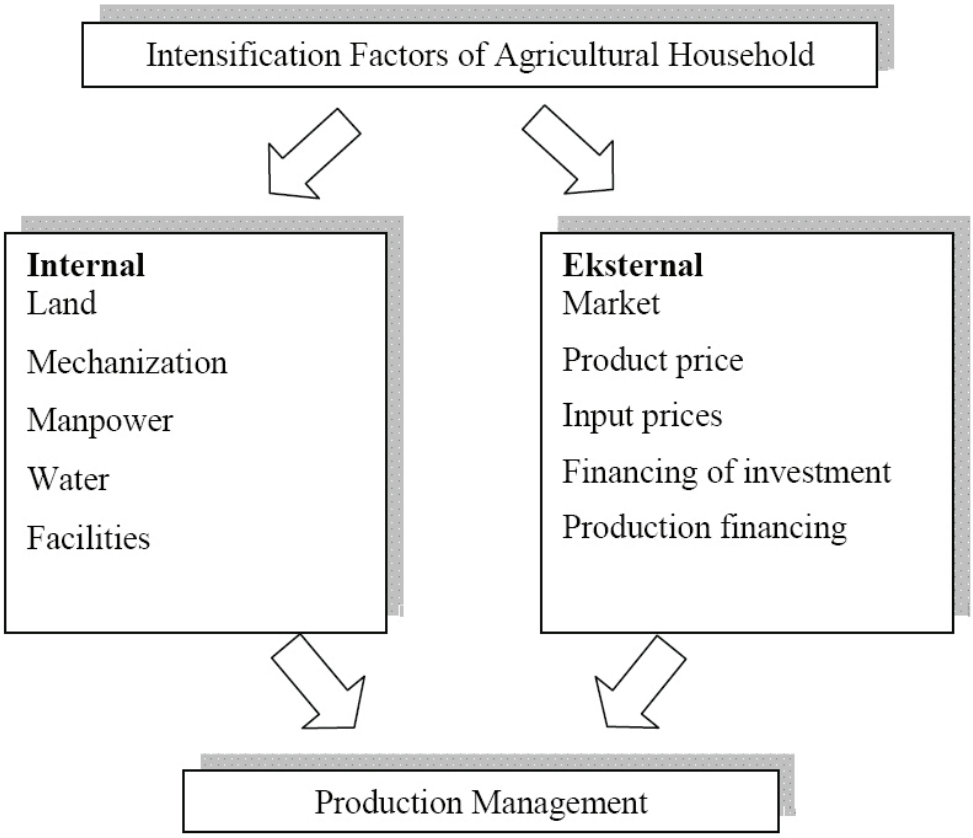
## Factors of agricultural intensification in conditions of irrigation

Research of the important factors of intensification of agriculture in our country may have several different approaches. External factors are particularly important for Government for improving nutritional balance of the country. Certain regions, particularly Vojvodina, should be interested because of the comparative advantages in relation to some intensification factors (land, water). Agricultural farm also have an interest in improving their production and economic results. To that objective, a systematization of these factors in relation to the mode of action was made (internal and external factors), the Scheme No. 1.

The task of management at the farm, in this case, would be coordination of available resources of the farms (marked as internal factors) with external factors. It is not an easy assignment, especially if it is for a longer period. New knowledge that provides information technology and GIS technology could be useful in this case.

For each farm the optimal level of intensity compared to the available production factors can be calculated. However there are still components of risk and uncertainty which we have not mastered enough in practical conditions. Because of this, intensification process is long-term research task.

*Scheme No. 1: The intesification factors on agricultural estates*




## Model of agricultural intensification of the regional hydro system

Bearing in mind that irrigation is an important factor of the intensification of agriculture production, an analysis of potential areas for irrigation in the present and future single or multi-purpose hydro system was conducted, table No 1. If this plan implements, irrigation would be enabled for 26% of cultivated area or 37% of arable land in Serbia. Effects of such enterprise should be investigated by more comprehensive study analysis.

There are numerous studies on the effects of irrigation in our production-economic conditions, particularly in already built Hs Danube-Tisa-Danube (Potkonjak S. 2002). Within this study we have investigated the influence of irrigation on the intensification of agriculture production on the example of a future regional system Grocka-Smederevo. On an area of 5,000 ha, where is to begin with the realization of the irrigation project, there is already, for our conditions, intensive production of vegetable

crops and perennial plantations. With the current representation, and returns that are achieved in existing production, benefit is 176,895.00 cereal unit.

*Table 1: The review of regional hydrosystem in Serbia – built up&planned*

| No.j | RHS | Purpose | The potential area for irrigation, ha |
|---|---|---|---|
| **I** | **AP Vojvodina** | | **950.200,00** |
| 1 | Hs Dunav-Tisa-Dunav | VVS | 510.000.00 |
| 2 | Hs Bačka | VVS | 138.000.00 |
| 3 | Hs Srem | JVS | 200.000.00 |
| 4 | Hs Novi Kneževac | JVS | 23.200.00 |
| 5 | Hs Kikinda | JVS | 30.000.00 |
| 6 | Hs Nadela | JVS | 29.200.00 |
| 7 | Hs Nova Crnja Žitište | VVS | 19.800.00 |
| **II** | **Central Serbia** | | **304.415.00** |
| 1 | Hs Negotinska nizija | JVS | 12.000.00 |
| 2 | Hs Mačva | JVS | 76.500.00 |
| 3 | Hs Kolubara | JVS | 200.000.00 |
| 4 | Hs Ključ (Kladovo) | JVS | 10.915.00 |
| 5 | Hs Grocka-Smederevo | JVS | 5.000.00 |
| **III** | **TOTAL SERBIA** | | **1.254.615.00** |

In the case of implementation of the proposed design solution, it is necessary to change the production structure, increase the individual contribution as well as introduce a second crop of annual crops. That would be an amount of 371,187.50 cereal unit, which is double the intensity. Except production, the economic effects of the intensification are very important. In this sense, comparison of the effects of intensification with and without irrigation, is conducted, Table 2. Undisputed effects in this case are: increase in product volume and intensity, increasing value and profit of production, and increase of production costs following by the applied measures.

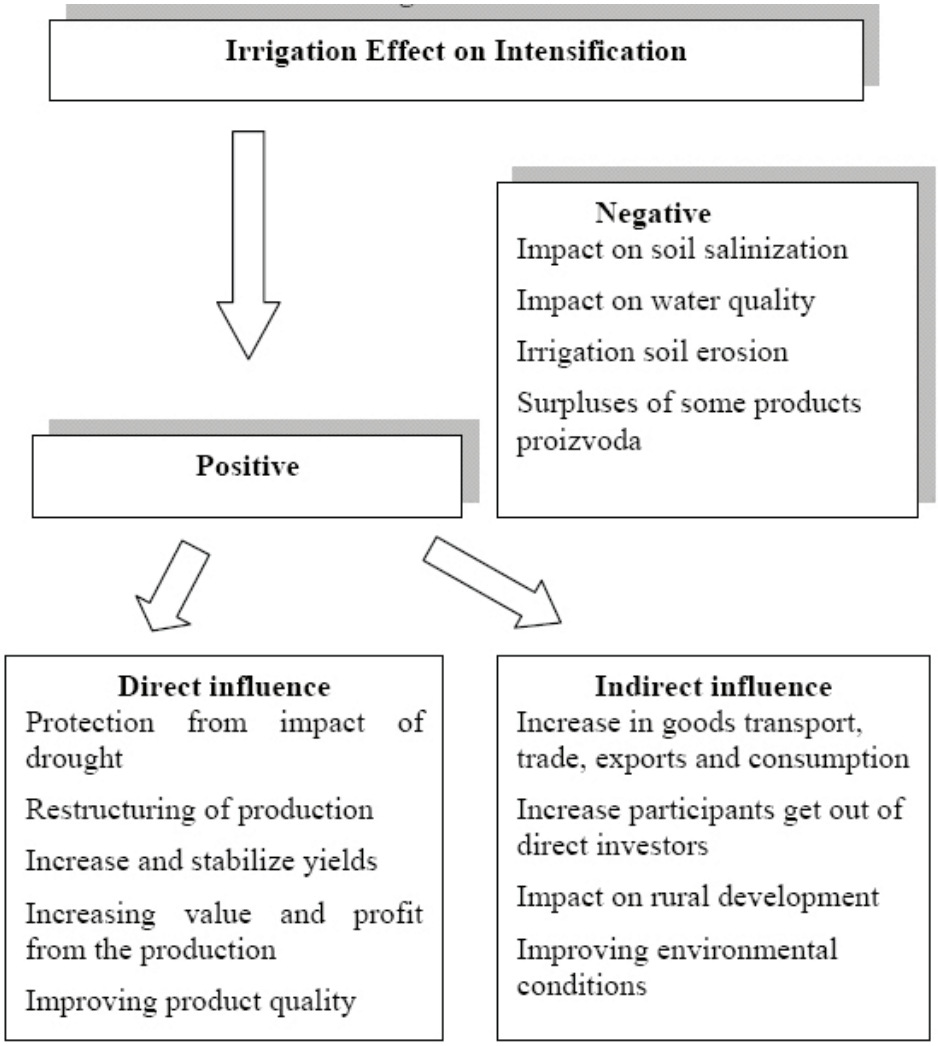
*Table 2: Comparison of intensification effects*

| No. | Parameters | With project | Without project | % of increasing |
|---|---|---|---|---|
| 1 | Value of production, € | 40.432.955 | 22.892.330 | 176,62 |
| 2 | Cost of production, € | 34.269.305 | 21.301.505 | 160,87 |
| 3 | Profit, total, € | 6.163.505 | 1.590.825 | 387,44 |
| 4 | Profit, unit, €/ha | 1.232,70 | 318,16 | 387,45 |
| 5 | Quantity of production, ton | 149.205 | 79.895 | 186,75 |
| 6 | Increasing of intensity, CU | 371.187,50 | 176.895 | 209,83 |

## The effects of irrigation on intensification (advantages and disadvantages)

Summing up the experience of the impact of irrigation on the intensification of agriculture production, observed over long period, may identify positive and negative effects that manifest at the same time, scheme No 2. It may be noted that this process is much wider, and its management touches several disciplines (water, land, environment, rural development). It is evident that the regional irrigation systems, along with other means of production are the holders of intensification. These systems should be linked with industry and market.

*Scheme No. 2: The irrigation influence on intensification*



## Conclusion

Investigation of the effects of irrigation on the intensification of agriculture in Serbia, which are presented in this paper, showed that the factors of agricultural intensification can be recognized as an internal (land, machinery, labor, water and facilities) and external (market, prices of inputs and products, financing investment and financing of production).

Surface irrigation (built or planned) belongs to one-purpose or multi-purpose hydro-systems. AP Vojvodina has 950,200 hectares of potential areas for irrigation and Central Serbia 304,415 ha. If these systems were built, irrigation would be enabled at 26% of cultivated area and 37% of arable land in Serbia. Irrigation could at least double the increase of the intensity of agricultural production (from 176,895 to 371,187 cereal unit). Volume and value of production also increase twice.

The effect of irrigation on the intensification of agriculture has a more positive direct effects such as protection from the influence of drought, the restructuring of production, increase and stabilize yields in some crops, improving product quality etc. Positive indirect effects are the increase in commodity markets and transport, the impact on rural development and improving environmental conditions.

Too intensive irrigation could negatively effect on water quality and soil salinization. Irrigation erosion and possible market surpluses of certain agricultural products could be also observed if structure of production was not carefully planned.

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Economics of agriculture
SI – 2
UDK: 339.13:631 (498)

# QUANTITATIVE AND QUALITATIVE ASSESSMENTS OF AGRI-FOOD TRADE TRENDS POST-ACCESSION - ROMANIA'S CASE

*Rusali Mirela*[1]

## Abstract

*The paper presents the main results of a quantitative and qualitative evaluation of Romania's agriculture external performances on the EU-27 market after the accession. The analysis comprise trends and structure of trade flows, determinants of the net trade and relative unit value indices measured on traded products aggregated by chapters/ sections of the Combined Nomenclature. The empirical results indicate changes in agri-food competitiveness, commercial disadvantages compared to EU products, dependence on imports of processed products and of animal origin, the low competitiveness of the processing sector being the main disadvantage in achieving higher revenue from exports. The general outcome underlines a decrease of domestic performance facing a growing external competitiveness, with a strong impact both on the food industry that have to reshape its strategies for going on the market and on the agricultural sector where changes imposed by adoption of CAP increase the pressures on farmers facing the market developments.*

***Key words**: agri-food trade, unit value index, competitiveness, EU accession*

## Introduction

Worldwide, agriculture and food industry are subject to the effects of fast and substantial changes induces by globalization and developments in of consumer's lifestyle. Under the background of the recent world crisis, these trends can intensify in the coming years, as a result of influences on production technologies and to agricultural trade (CE, 2009). In addition, the performance of agri-food sectors reflected by the productivity and competitiveness levels, in continuous transformation, determine their

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role in the economy they belong to.

At regional level, the competitiveness resides not only in the competitiveness of its constituent individual firms and their interactions, but also in the wider assets and social, economic, institutional and public attributes of the region itself (CE, 2004). Therefore, the notion of regional competitiveness is as much about qualitative factors and conditions as it is about quantifiable attributes and processes.

Nevertheless, the inequality of the world crisis affects economies; therefore, in the context of the recent regional integration to the EU common market in the post-accession, Romania's agri-food sector sensitivity analysis requires special attention. The paper addresses the competitiveness of the Romanian agricultural sector from the foreign trade performance side, involving either quantitative or qualitative assessments of the agri-food products trends on foreign markets. The analysis pursue either an identification of products affected by the severe European competition and perspectives of improvement of the domestic products access on external markets, as vital factor for promoting the economic growth and integration in the global economy.

## Objectives and Methods

The investigations widen the previous researches upon the sector's trade profile associated to policy impact effects in the international trade pattern and comprise the main trends in the structure of trade flows, trade balance determinants and in relation to the trade unit value indices assessed on products aggregated by chapters, or sections of the Combined Nomenclature (C.N.), using EUROSTAT trade statistics database.

The methods consisted in quantitative and qualitative analysis of the Romanian foreign agri-food trade after the accession on the EU-27 market. The main effects consist in either post-accession trends in the performances, or shortcomings of Romania's agri-food trade development within the common EU-27 market, in the period 2007-2009, including sectoral performances facing external competitiveness, as well as sensitive areas of the Romanian food sector which can be particularly exposed to the global crisis. Since the importance of the EU has been continuously increasing, the assessments on intra-Community agri-food trade trends highlighted the existing opportunities of the products with expressed export potential and the areas affected by the net imports respectively, by product groups. The paper attempted to identify the needs to improve the sectoral performance in the context of foreign producers' competition.

The assessment methodology of vertical or horizontal integration of the agri-food trade deals with the analysis of the commercial food quality, through the calculation of relative unit value indices. Analyses covered products grouped by sections of the C.N.. The assessments comprised the quality - low (poor) or high - of the county's exports in relation to imports, by the range of the relative unit values within the classification thresholds of +/-15% (Hine, 1998). In this way, it is assessed whether the products are horizontally integrated (homogeneous), when the unit value index of trade flows is included in the 0.85 to 1.15 interval. The vertical differentiation can be assessed when the

unit denominations of the export and import flows does not fall in the margin +/-15%; it corresponds to different qualities and prices traded products belonging to the same sector, determined by the levels of factors endowment creating comparative advantages.

## Results and Discussions

In the previous two decades, the performance of the Romanian agri-food sector has been influenced by changes in the sector brought about by the internal reforms of political transition to market economy, restructuring and institutional adjustments needed for the CAP adoption and integration into the common market arising from EU membership. In the period 1999-2006, Romania was on the way of intense preparation of its accession to the EU.

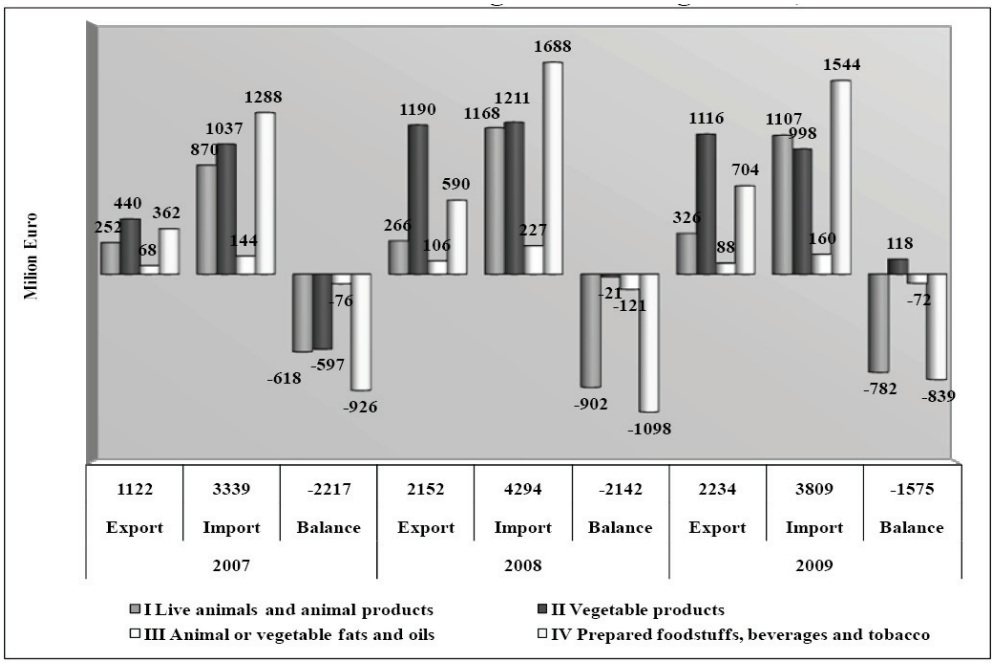
During the pre-accession period, the agri-food trade between Romania and the Member States developed under the influence of the European Agreement on agriculture and EU became Romania's main trade partner. In 2007 Romania obtained the membership status, while the agri-food exports on the intra-Community market contributed to the increase of 9.7% in the gross value added in Romania's agriculture. The most significant export and import flows, in terms of trade values, have been mainly with Italy, Germany, Spain, Greece, Hungary, France, and Netherlands, followed by Belgium, Austria and Poland.

As a general feature, the annual variation of trade over the last before the accession showed a greater increase of imports than exports, the increase in European products competition as a result of the first enlargement to the central and east European countries, but also a trade creation effect on the common internal market.

**Post-EU-27 Accession Trends of the Agri-food Trade.** Under the influence of the developments in the domestic economy subsequent to EU accession, the period 2007-2009 was reflected in the country's foreign trade by an intensification of both import and export flows, yet Romania remaining a net agri-food importer.

The total agricultural trade experienced a 44% growth compared to 2007, i.e. from 4.4 to 6.4 billion Euro in 2008 and 6 billion Euro in 2009 (Chart 1).

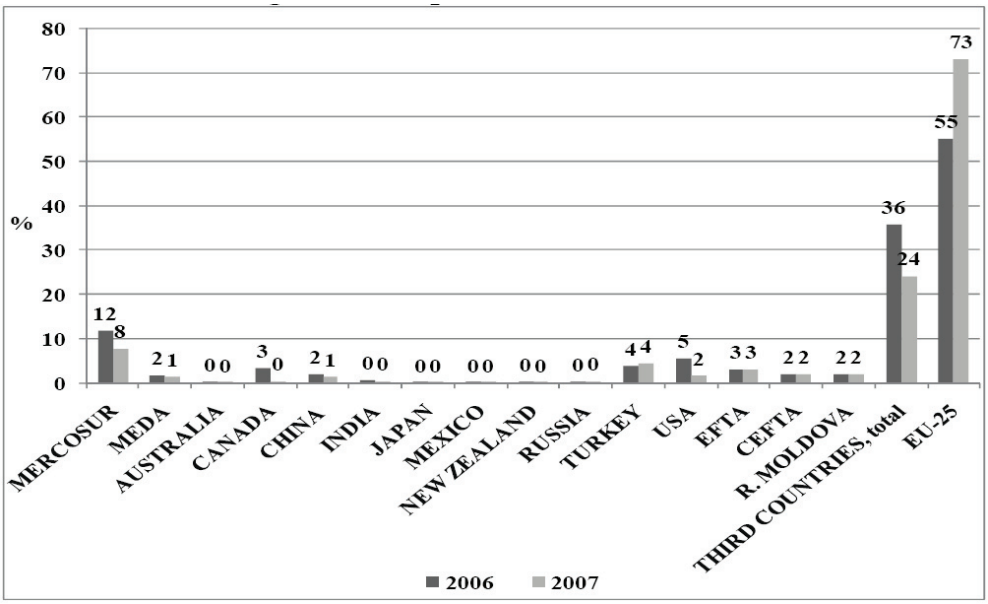
*Chart 1. Trends in Romania's agri-food foreign trade, 2007-2009*




*Source: own processing of EUROSTAT trade statistics.*

As well, while Romania's agricultural products traded with the EU-25 covered a 50% share in imports and 40% in exports before accession, in 2007, the country's relations within the region even grew in importance, to a 73% share in imports, and 70% in exports, whereas the imports absorbed by Romania from third countries shows a market share decrease (Chart 2).

*Chart 2. Trends of agri-food imports share from EU and third countries*




*Source: own processing of EUROSTAT trade statistics.*
*.Note: MERCOSUR =Argentina, Brazil, Paraguai, Uruguay, Venezuela; MEDA = Syria, Egypt, Tunisia, Lebanon, Morocco, Algeria, Jordan, Israel.*

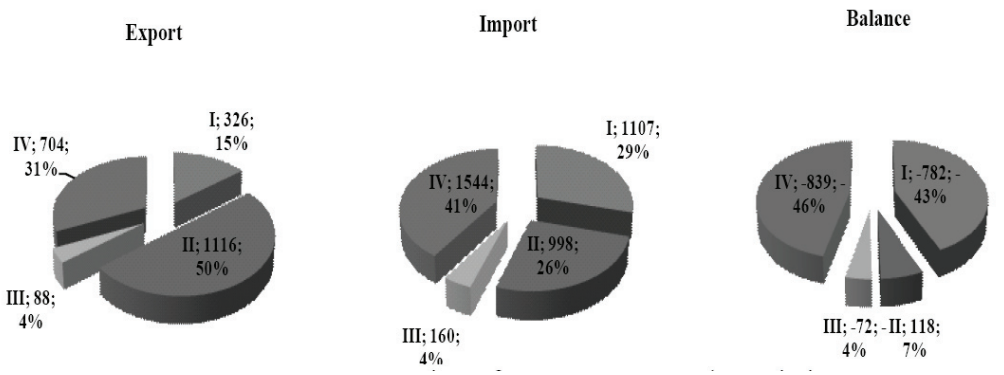
As shown in Chart 1, annual exports increased, accounting for 1122 million Euro in 2007 and almost doubled afterwards, to reach 2234 million Euro in 2009. As well, the importance of agri-food exports in GDP in the agricultural sector increased from 15.6 % in 2007 to 24.5% in 2008 and 30.7% in 2009.

However, imports also significantly increased from 3.3 billion Euro in 2007 – up by 37% compared to 2006 - to a historical record value of 4.3 billion Euro in 2008. A slight decrease was noticed in 2009, when the value of imports reached 3.8 billion Euro. Accordingly, the trade balance drastically deteriorated, reaching a significant deficit of over 2 billion euro in 2007 has been experienced a certain contraction trend, in 2008 respectively, amounting to -1.5 billion Euro value in 2009.

Except for the year 2009 when a net export of vegetable products was registered, the agri-food trade balance was negative for all the remaining chapters of the C.N. (Chart 3). Vegetable products shared half of exports, and worth 1.1 billion Euro, and 26% of imports, totaling 300 million Euro.

The trade deficit in the year 2009 was mainly due to the products included in chapter IV- Prepared foodstuffs, beverages and tobacco (46% of the trade balance) - whose exports totaled 704 million Euro while their imports 1.5 billion Euro, and in chapter I - Live animals and animal products (43% of the balance), accounting for 326 million exports and 1.1 billion Euro imports.

*Chart 3. Structure of agri-food export, import and trade balance, in 2009*

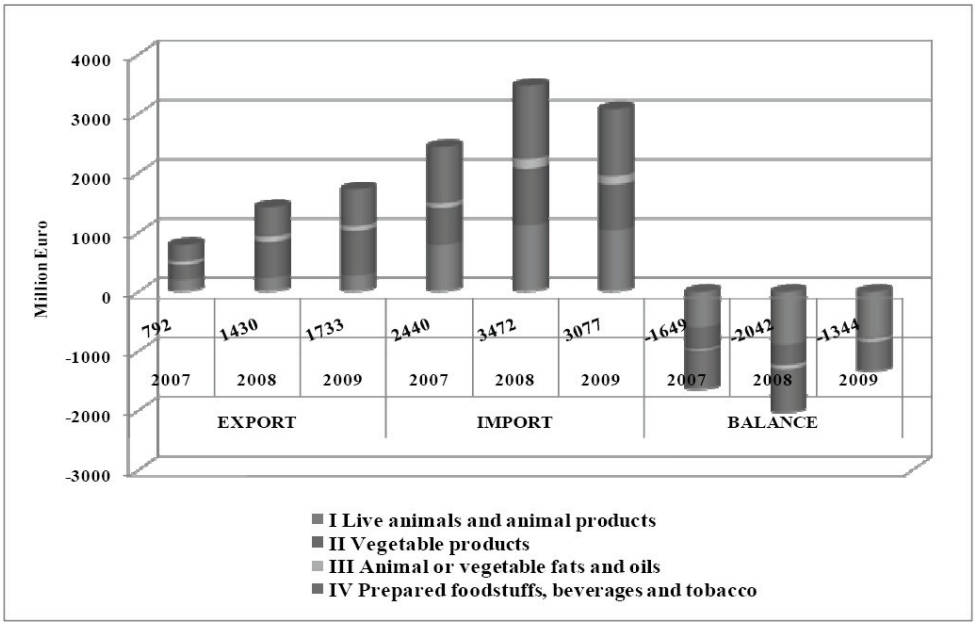



*Source: own processing of EUROSTAT trade statistics.*

The traded products in chapter III - Animal or vegetable fats and oils, also deficient, maintained a 4% share in trade flows and balance.

EU has been the main trading partner for the past 10 years; in the post-accession period 2007-2009, EU countries represented 70-80% of food export destinations of Romania and at the same time their imports share raised from 73% in 2007 to 81% in 2009.

*Chart 4. Trends in Romanian agri-food foreign trade with the EU*




*Source: own processing of EUROSTAT trade statistics.*

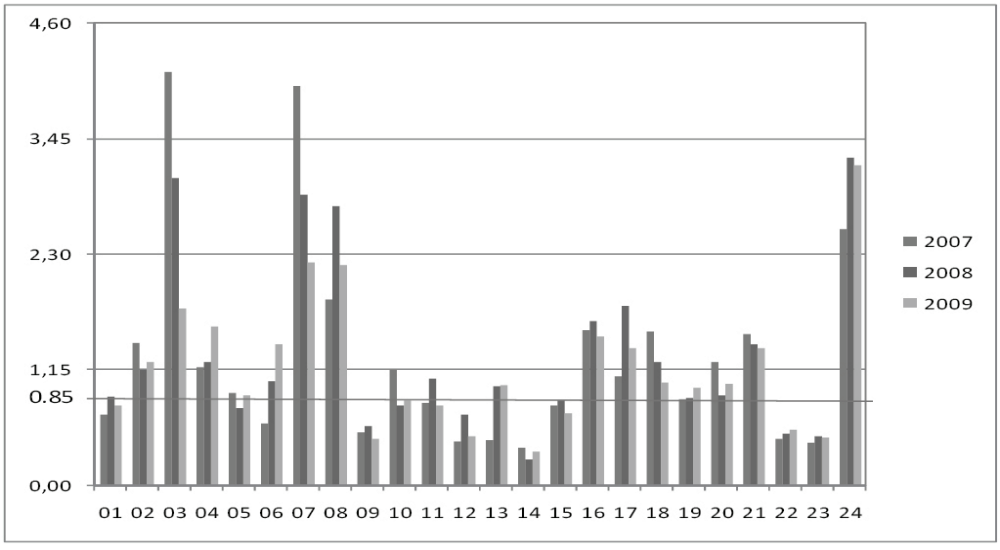
Trade balance in the relationship with the EU has remained insufficient to all categories of products (Chart 4) and in most of the sections of the C.N..

Net exports to the EU member countries have been achieved only products belonging to the following groups:

- 01-live animals, where exports have remained on average to 136 million Euros, but gained a rate of growth of 248% in 2009 compared with 2007, from accounting for 47 to 117 million Euro;
- 10-cereals, were in 2009 exports totaled a value of 361 million Euro, while imports of 228 million Euro.
- 12-oil seeds, whose exports increased almost 4 times, registering 317 million euro in 2009, while imports 70% larger, of 105 million Euro.
- 24-tobacco and tobacco substitutes, tripled their exports, worth of 348 million Euro, while imports of 126 million Euro.

**Assessment of the quality of agri-food products foreign trade, by the relative unit value index.** According to the described method, the outcome of the analysis was that the agricultural products and foodstuffs that had a low average value of exports in the year 2009, indicating a lower quality, correspond to those included in sections: 01-live animals; 09-coffee, tea, mate and spices; 10-cereals; 11-products of milling industry; 12- oleaginous seeds and fruits, medicinal or industrial plants, straw and forage; 14-plaiting materials and other products of vegetable origin; 15- animal or vegetable fats and oils; 22- beverages, spirits & vinegar; 23-residues and waste from food industries (Chart 5).

*Chart 5. The relative unit value indices of the Romanian agri-food trade, 2007-2009 trends*




*Source: own calculations based on EUROSTAT trade statistics.*

At the same time, products sold at high prices on foreign markets, revealing high-quality exports and specialization level, were those placed in the sections: 02-meat and edible offal; 03-fish and crustaceans; 04-milk and dairy products, birds' eggs, natural honey; 06-live plants and flower products; 07-edible vegetables, roots and tubers; 08-edible fruits; 16-preparations of meat and fish; 17-sugar and sugar confectionery; 21-miscellaneous edible preparations; 24-tobacco. These products, vertically integrated, accounted for 32% of Romania's agri-food exports, while lower quality products shared double, 63%.

Horizontal trade integration corresponds to the exchanges of products that have similar characteristics and qualities, in theory being a situation determined mainly by the economy of scale and consumer preferences for various goods. The empirical results have identified the following groups of products included, in 2009, in this range: 05-other products of animal origin; 13-gums, resins and other vegetable saps and extracts; 18-cocoa and cocoa preparations; 19-preparations of cereals, flour, starch; pastry; 20-preparations of vegetables, fruits; even though this category of products had an extremely low share in exports, of 5%.

An improvement of the terms of trade could be observed, in 2009 comparing to 2008, on the groups of products including meat, milk and dairy produce, other products of animal origin, live plants and flower products, cereals, plaiting materials and other products of vegetable origin, preparations of cereals, vegetables or fruits and beverages, spirits and vinegar.

The evaluation regarding the quality of international trade is an useful instrument to support the policy decisions concerning the restoration and development of the sector; applied on foodstuffs it might have the purpose to promote the products with export potential and those returning extra benefits from international markets, focusing on products with high value added.

## Concluding Remarks

The results underline a decrease of domestic performance in the face of growing external competitiveness, with a strong impact both on the food industry that needs to reshape the strategies for going on the market and on the agricultural sector, where changes imposed by the adoption of CAP have increased the pressures on farmers to face the market developments.

The assessments of the Romanian foodstuffs competitiveness indicates a commercial disadvantage compared to the EU products, dependence on imports of processed products and of animal origin, the low competitiveness of the processing sector being the main disadvantage in obtaining higher revenue from exports.

The influences on food markets can be reflected by temporized import flows, narrowed supply ranges, but also by the reduction of external agri-food trade deficit, however through less competitive exports rather than on the basis of imports.

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Economics of agriculture
SI – 2
UDK: 637.5

# TRENDS AND DEVELOPMENTAL POSSIBILITIES OF MEAT INDUSTRY*

*Radojica Sarić[1], Svetlana Roljević[1], Bojana Bekić[1]*

## Abstract

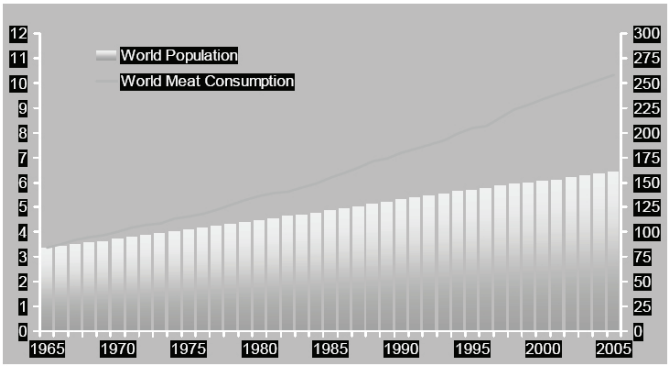
*Meat has great significance in diet of population from the aspect of biological and nutritive value. Development of meat industry and permanent research of meat products market represent important assumptions for future development of agriculture, agro-industry and economy in general. Important assumption for long-term market stabilization and larger export is bigger, more stable, structurally more adequate and more quality livestock production, especially production and processing of meat and meat products. Main goal of this paper is to point out on current trends in meat industry development, for the purpose of easier identification of possibilities concerning defining of strategically sustainable solutions. In this paper, based on „Desk Research" method, data collected from various relevant scientific, professional and statistical publications from domestic and foreign literature are going to be used, processed and analyzed.*

***Key words*****:** *meat industry, meat and meat products, market, trends, strategically sustainable solutions*

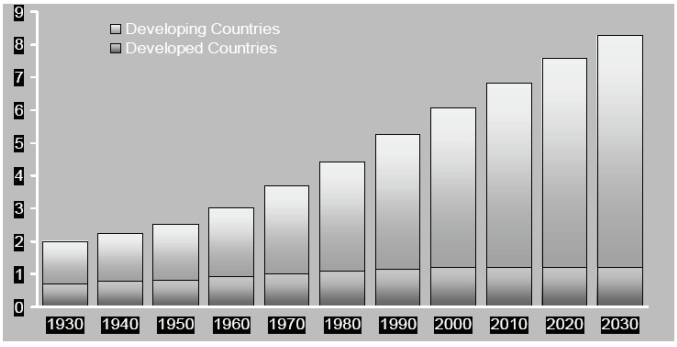
1 *Paper work is a part of research at the project „Multifunctional agriculture and rural development in function of accession of Republic of Serbia into European Union", number 149007, financed by the Ministry of Science and Technological Development of Republic of Serbia and „Solutions and interventions for the technological transfer and the innovation of the agro-food sector in South East Regions - TECH.FOOD", financed in the frame of South East Europe Translational Cooperation Programme (SEE Program), cris no. 2009/223-318.

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## Introduction




According to FAO data, meat consumption in the world has larger growth rate than growth rate of human population, and that growth is especially expressed in developing countries, with the predictions that it is going to be even faster in the future.




According to some researches and prognosis, in year 2050 human population on Earth will reach 9,2 billion people. Their need for food, mainly meat and meat products, due to growing trend, will be significantly greater than today when number of people is about 6 billion. Considering the previous, as main worldwide problem in near future will be production of enough quantities of nutritionally valuable and safe food. Also, the problem will be providing of solid and functional connections between production and processing of meat, from the aspect of interest and quality. Solutions for overcoming of these problems are restructuring of food production, creation of functional connections between certain production segments and connection of meat production and processing in unique agro-industrial complex that is based on strategically sustainable solutions. Meat industry has major role in all that, considering that it is an important factor of agricultural development and development of agro food industry, namely agro-industry, and thus domestic and world economy.

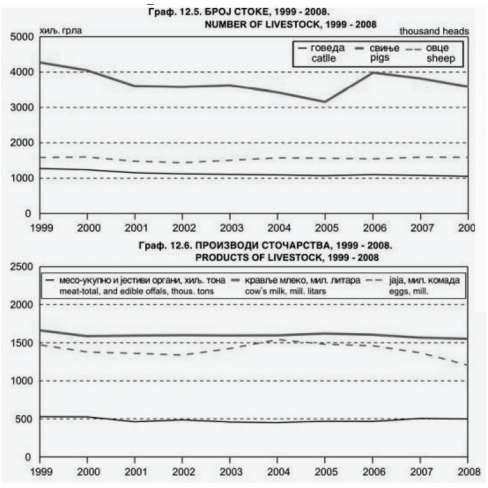
## Assessment of current state in Serbian meat industry

In Serbia, production of meat and meat products has long tradition. Serbia is the largest producer, exporter and consumer of all types of meat among CEFTA countries. However, this production is significantly smaller comparing to production in EU countries. In the last few decades, production of meat and meat products has

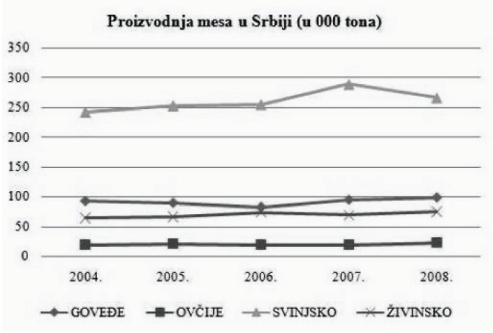
continous negative trend. Also, it has structural problems and it is uncompetitive. Among main problems are cyclical production, uncompetitive price, comparing to producers from EU, and impossibility of export at EU market, because of unfulfillment of basic quality and safety standards for meat and meat products. Overcoming of these problems is one of the basic goals of agrarian politics in period 2009-2011, from the aspect of improvement of production of meat and meat products in the future.

Having all this in mind, we can conclude that this production faces with large challenges, during process of accession of Serbia to EU, with emphasizing that it is also the greatest chance for future development of livestock production in the country, and thus agriculture and national economy in general. Generaly speaking, in the past ten years, livestock fund and livestock products show stagnation and even tendency of decrease, except slight growth of production of certain meat types. In 2009, meat production in Serbia was 457.000 t, which was 1,5% lower comparing to year 2008. This reduction is a consequence of the world economy crisis and decrement of population purchasing power in the country. In the first half of 2009, Serbia exported about 40% less meat while export of meat products was lesser for 25% comparing to the same period 2008. At the same time, meat import was increased for about 17% while meat products import was slightly decreased, about 0,4%.

*Picture 1. Cattle number and livestock products in period 1999-2008.*




*Picture 2. Meat production in period 2004-2008.*




*Source: Statistical Office of the Republic of Serbia and Serbian Chamber of Commerce*

Although pork meat production is by quantity the largest production comparing to production of other types of meat in Serbia, cattle production has the largest participation in total livestock production in Serbia, due to higher meat price and cattle value and the fact that most cattle serve for milk production. Cattle production participates with about 38% in total livestock production, while in total meat production participates with about 21,4%. Two main cattle breeds in Serbia are Holstein-Friesian

breed and Simmental breed. Present production of cattle and beef meat is determined by: processing capacities, quality of diet, economic position of the producer and situation on meat and milk market. Last few years there is a worrisome trend of decreasing of number of cows and heifers, which is decreased for 32% in period 1996-2006.

Right next to cattle production, from the aspect of percentage participation in total livestock production, is production of pigs. Also, of all meat types, pork meat has the largest percentage share in total meat production, about 55%. However, what worries is certainly decreasing trend of pig meat production, year after year. Comparing to 2008, pig meat production in 2009 decreased for about 5,3%. Production of pigs and pig meat is traditionally dominant at family farms and it is predominantly directed toward production for own needs. Production of sheep and sheep meat in Serbia will have great developmental perspective in the following period considering the natural potential of our country, especially in highland mountain areas. Possibilities for export are very low, due to current production, which can not satisfy the needs of population in the country. It mainly refers to lamb meat. Main characteristics of sheep production in Serbia are extensiveness, lack of purchase organization, old production technologies and insufficient utilization of present processing capacities. Production of sheep and lamb meat is the most frequent in the private sector (about 98%). Due to that, the largest attention in the future developmental programs should be given to that sector, but also to new production technologies which deal with intensification of sheep and lamb meat production.

In the last years, production of poultry meat was often varied, which points out the instability of this production. Instability of production is connected with instability of market prices, which are caused by turbulent market conditions that are dictated by disorganized and uncompetitive producers. Namely, production is based on fulfillment of current local market needs for poultry meat, which significantly varies during the year (season) so that there is production *„when needed"* rather than continuous production. Trend of production had smaller/larger oscillations during the last years, but considering the period 1996-2006 numbers of poultry was decreased for 28%. Main problems in poultry meat production in Serbia are underground economy and lack of vertical connections in the production chain of meat and eggs.

Consumption of meat and meat products in Serbia is small comparing to EU countries. Trend of consumption of meat and meat products is in direct correlation with their price and purchasing power of the population. In Serbia, average consumption is 36 kg of meat per capita which is two times less than in EU where average meat consumption is 86,7 kg per capita. In terms of meat consumption only Albania is after our country. Participation of Serbia in total world meat consumption is extremely modest, about 0,17%. In this, production of beef and poultry meat is about 0,1%, and production of pig and sheep meat is about 0,2%. Participation of Serbia in international meat trade is very modest, but also very uneven depending of the product: export of sheep meat (0,01%), export of beef (0,1%), import of beef (0,001%), import of pig meat (0,05%). Export of meat and meat products is mainly directed to Macedonia, Italy, Greece, Russia, Hungary, Bosnia and Herzegovina, Montenegro, Croatia etc. Import of meat and meat products is mainly from Austria, Slovenia, France, Greece, Germany,

Hungary, Italy, Bosnia and Herzegovina, Croatia, Macedonia, Spain, Holland, Denmark etc. The largest participation of domestic foreign trade exchange of meat and meat product is conducted at European market, mainly in surrounding countries. Export should expand into larger number of countries in the world and at the markets whose consumers have greater purchasing power.

Regarding meat products they can be found in a slightly more than 50% of retail objects in Serbia. From the aspect of sales channels about 60% of meat products are being sold in hypermarkets and supermarkets. Little less than 1/4 goes into large shops, while the rest is being sold in small shops. The largest part of meat products, about 40% is being sold in Central Serbia, 1/3 is being sold in Belgrade, while the rest goes to AP Vojvodina. Five the most important meat producers in Serbia occupy nearly 3/4 on the market of meat products: *Agroživ*, *Karneks*, *Neoplanta*, *Perutnina Ptuj* and *Juhor*. Among five the most significant trade marks of meat products which can be labeled as Serbian brands are: *Karneks*, *Neoplanta*, *Perutnina Ptuj*, *Poli* and *Juhor.* Among meat products on the market the most dominant are salami (83%), ham (8%), breasts (3%), sliced meat (2%), pršuta (2%) and other products (2%).[2] At the market, the most present are meat products made of poultry meat (58%), made of pork (26%), made of beef (12%) and made of other meat types (4%).[3]

Negative trends in production of meat and meat products in the last two decades, which can be seen in halved livestock fund and decreased production and processing, point out the need for restructuring of agriculture with larger participation of livestock production in total agricultural production of Serbia. Stabilisation of so far unfavorable economy trends in the livestock production sector, requires quick reaction by the creator of agrarian policy trough adoption of adequate strategic developmental programs. Aim is defining strategic concept of sustainable development of livestock breeding in Serbia, which would contribute to growth of production capacities in livestock production, measured by number of livestock unit and by weight gain per cattle unit. Changings in this sector are slow, long, hard and influenced by three most important elements:

(1) Ending of transitional process;
(2) Integration and accession to EU;
(3) Radical reconstruction and modernization of entire agricultural/agro food sector.

In the sector of production of meat and meat products, it is necessary to develop long term developmental politic, which is going to be supported by financial means from the agrarian budget, and implemented trough adequately defined program of strategic improvement of this sector. With this approach, more adequate preconditions

2 Source: Agency for research „Nielsen" (data for period June 2008 - May 2009 of years which refer to quantitative participation at the market of Serbia), notice: special shops for food sale and butcher shops are not included.

3 Ibidem.

for creation of favorable environment for future development of meat industry in our country are going to be created. At long term, it would mean improvement of business of producers in meat industry trough: reduction of expenses, increment of productivity and profitability and also realization of safety and quality of meat and meat products. Such approach, as socially responsible, considers finding of new developmental possibilities trough implementation of concrete measures and strategically sustainable solutions from the aspect of:

(1) Building of supporting institutions directed toward developmental politics at micro and macro level, and improvement of capacities for defining, conducting and control of developmental politics;
(2) Creating of regional clusters in the field of livestock production;
(3) Defining and conducting of investment support for modernization of processing capacities and livestock fund (through breeds selection and their larger application in production as well as improvement of their living conditions);
(4) Growth of livestock production on the market, trough vertical integration in the sector of production of meat and meat products, with adequate marketing and export stimulations, for the purpose of concurrency growth and stronger breakthrough on international markets;
(5) Adoption and application of necessary standards from the aspect of quality and safety, and implementation of adopted legislation related to production, processing and trade (implementation of ISO standards, mainly ISO 9001:2000, ISO 14001, ISO 8000, ISO 26000 and ISO 22000, but also the HACCP system and standards derived from it).

## Production and international trade of meat in the world

World production and international meat trade are characterized by positive developmental trends. With average annual growth rate of 2,5%, world meat production in period 2006-2008 reached the level of 286 million tons. Over 75% of world meat production is in Asia (44,9%) and America (30,3%). Participation of Europe (18,3%) is significantly lower, especially low is participation of Africa (4,4%), Australia and Oceania (2,1%). According to this, average world production of meat per capita is about 43 kg. Meat production per capita in Asia (32 kg) and especially in Africa (13 kg) is significantly below world average. In the structure of world meat production, the leading position has pig meat with participation of about 41%.

On the second place is poultry meat with participation of about 30%. Participation of beef meat is about 23% - third place, while the participation of sheep and goat meat is about 5% - fourth place. The last, fifth position, with participation of 1,5%, belongs to other meat types (horse meat, donkey meat, mule meat, rabbit meat, game meat, bird meat, camel meat and snail meat). However, this production volume significantly lags behind optimum alimentation needs of the world population. Volume, dynamics and structure of meat production very differs and it's very uneven

per continent and per country, mainly because of different regional position and level of development of numerous natural, economic and social factors. As the most important factors are: livestock fund (number, structure and breeds composition), level of economic development of the country, development of the agriculture and agro food industry, level of scientific, technical and technological achievements and measures of agrarian and economical politics of the country.

From the point of economical development, developed countries make larger part of world beef production (about 55%), while undeveloped countries and countries in development have larger participation in production of pork (about 57%), poultry (about 53%), sheep and goat meat (about 56%) in the world. Comparing to the production, international trade of meat has more dynamic growth rate. With average annual rate of 4, 6%, international trade in period 2006-2008 has reached the level of 33 million tons, which represents only about 12% of total world meat production. Relatively modest participation of meat in international trade, comparing to the volume of world production, is determined by specific technological/commercial characteristics of the products, wide dispersion of production and longing of all countries in the world to cover domestic needs for meat mainly by own production, which especially refers to undeveloped countries and countries in development.

Regional distribution of trade is very different and uneven, by volume and structure, and also by type of meat. Europe (42%) and America (41,1%) make over 83% of world meat export. Participation of other continents in world export of this product is much lower. Asia participates with 8,6%, Australia and Oceania with 8,1%, while participation of Africa is nearly symbolical 0,2%. Also, Europe has high participation, in the export of meat in the world, even 51,2%. After Europe, there is Asia (26%) and America (15,9%), while participation of Africa (5,2%) and especially Australia and Oceania (1,7%) is very modest. Regarding all meat types, except import of poultry meat, developed countries comparing to undeveloped and developing countries have larger participation, both in total export and total import of these products.

## Conclusion

Volume and structure of domestic meat production significantly lag behind available resources and demands of domestic/international market. Meat industry must adjust itself to new and complex business conditions at the world market, especially conditions in EU. It considers opening of new possibilities for development of this sector in our country but also change of so far business system for the purpose of more successful and more quality business. As one of the possible development approaches, is defining of integral system of production and processing of meat and meat products, which would be in the function of sustainable development. This system should contribute to: optimal usage of available resources, protection of ecosystem and biodiversity, increment of production of biologically valued and healthy safe meat and meat products.

Long term speaking, it would mean reduction of differences between rich and

poor regions in the country trough rising of level of life quality of local communities, trough overall improvement of population status in rural areas and trough encouragement of the population to stay in less developed regions. Also, it would contribute to achievement of stability of cattle production at the level of the country, which would create conditions for continuous investing and increment of export potentials in this sector. Surely, this would influence at the prosperity of agro industrial complex, but also national economy in general. Large role in all that should be given to properly defined legislation which represents basis for successful functioning on the market. Implementation of laws and standards must guarantee fair competition in this sector and its goal is protection of consumer's interest.

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Economics of agriculture
SI – 2
UDK: 631.1

# ECONOMIC SUSTAINABILITY OF AGRICULTURAL ENTERPRISES

*Sharikova Irina Victorovna[1], Sharikov Artem Victorovich[2]*

## Abstract

*Dynamics of agricultural enterprises' economic stability of the Saratov region is analyzed. The estimation and classification of municipal unions is given by the authors. The influence of state support level on economic stability of enterprises is revealed.*
***Key words:*** *Dynamics, agriculture, economic sustainability, classification of municipal unions, development*

## Introduction

The problems of stable development have become popular recently (the notion was first formulated by "Bruntland Commission" in 1987 and then at the conference in Rio-de-Janeiro in 1992) and also have been much spoken about in numerous publications, discussing concepts concerning resources, society, production, finance and so on.

We took much interest in this problem too and our works paid great attention to economical stability of agricultural enterprises allowing them to perform regime of self investing aimed at capital reproduction which deviates from stable equilibrium a little, under various conditions connected with natural and other factors. This regime is possible under conditions of normal weather, certain level of agrarian production and the degree to which it meets the demands for this produce.

## Applied methodology

The indicators showing economical sustainability of agricultural enterprises are profit and cost recovery; the analysis made connected with 1993-2007 years. It resulted

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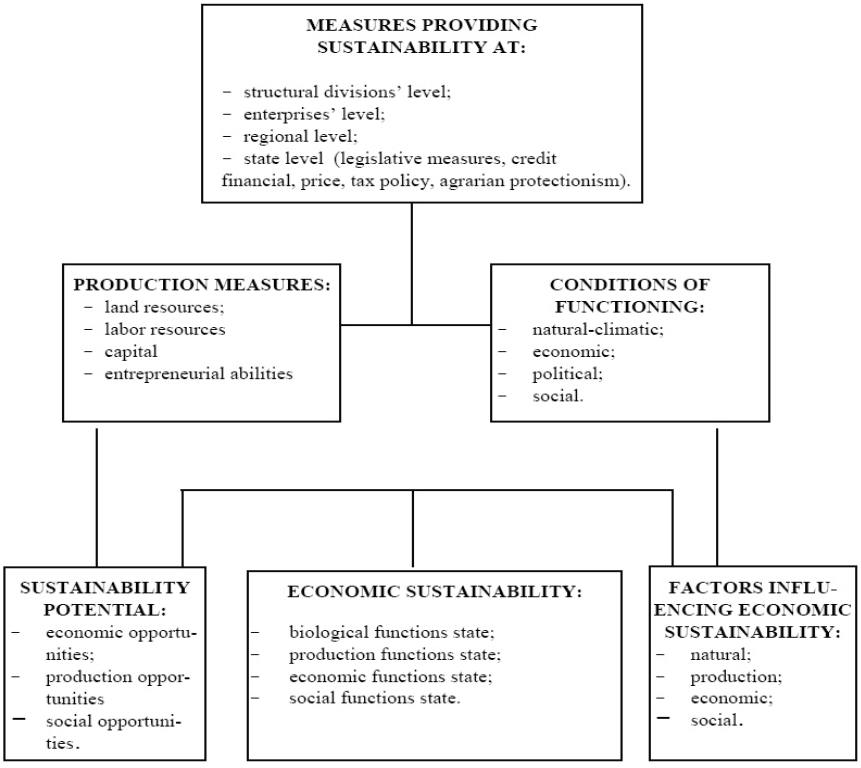
2 Sharikov Artem Victorovich, Ph.D. Ec. Sci., Economic Cybernetics Chair, State Vavilov Agrarian University Saratov, 410012 Saratov, Teatralnaya Square 1, Russia, phone: +7 (8452) 237635,

in estimation of economical of agricultural enterprises in Saratov region classification of municipal establishments into agriculture and some other recommendations.
Ensuring of sustainable functioning of agricultural enterprises is based in our opinion, on the efficient usage of land, capital, labor and business abilities of people and should be accompanied by state control and regulation in more successful from the financial point of view economy and about the gradual adaptation of a part of agricultural enterprises to market conditions of managing.

Indicators of fluctuation ($\sqrt{\sigma^2}$ , $\sigma^2$) characterize the general variation of the financial results, caused by all factors operating in economic system which can be divided conditionally into two groups: not dependent on the person and antropogenous factors. In annual fluctuation of the results of activity of the agricultural enterprises of area the role of casual (mostly meteorological) factors was measured basically during the period from 1993 to 2007 98-99 %. In accordance with this, the share of antropogenuous factors is measured from 1-2 %. Unlike a tendency of dynamics connected with the action of the long existing reasons and conditions of development, fluctuations are caused by the action of the short-term or cyclic factors influencing separate levels of a number and rejecting them from a tendency in one or in the other direction.

This dependence has been expressed by the scheme, characterizing the main factors influence on agricultural enterprises' economic sustainability (Fig. 1)

*Figure. 1 - Agricultural enterprises' sustainability increase factors*



## Researching results with discussion

To estimate economic sustainability there were selected 318 large-scale enterprises from 38 districts of Saratov region. Significant part(49 %) of which according to the results of 1993-2002 activities were non-profitable.(table 1)

*Table 1 – Dynamics of Financial Results in Agribusinesses of Saratov Region (1993-2007)*

| Figures | revenue (+), loss (-), thousand rubles | | | Returns of investment, % | | |
|---|---|---|---|---|---|---|
| | 1993-1997 | 1998-2002 | 2003-2007 | 1993-1997 | 1998-2002 | 2003-2007 |
| Mean: Prime arithmetical | -577 | -257 | 7492 | 79 | 95 | 129 |
| Weighted arithmetical | -505 | -172 | 7716 | 83 | 98 | 130 |
| $y_{max}$ | -112 | 1430 | 14384 | 97 | 116 | 160 |
| $y_{min}$ | -1772 | -1340 | 2341 | 56 | 74 | 108 |
| Variation range $R$ | 1659 | 2769 | 12043 | 41 | 42 | 52 |
| Total variance $\sigma^2$ | 137893 | 592032 | 16290084 | 133 | 126 | 252 |
| Accidental variance $\alpha$ | 0,990 | 0,741 | 0,980 | 0,989 | 0,909 | 0,775 |
| Determination coefficient | 0,010 | 0,259 | 0,020 | 0,011 | 0,091 | 0,225 |
| Mean-square deviation $\sigma_{осн.}$ | 369 | 662 | 3996 | 12 | 11 | 14 |
| Coefficient of variation, % $v$ | 64,0 | -257,8 | 53,3 | 14,5 | 11,2 | 10,8 |
| Spearman correlation coefficient | -0,087 | 0,508 | 0,515 | -0,062 | 0,314 | 0,519 |

To summarize, financial result of enterprises activity in the aggregate was negative. During the next five years the number of non-profitable enterprises was constantly decreasing, and according to the results of 2007 performance their share was less 10 %, which was the positive process connected with improvement of economic conditions of farming, some additional provision of material-technical resources. What's more, Saratov region variety of natural conditions sometimes leads to thousand fold difference in the amount of financial results got.

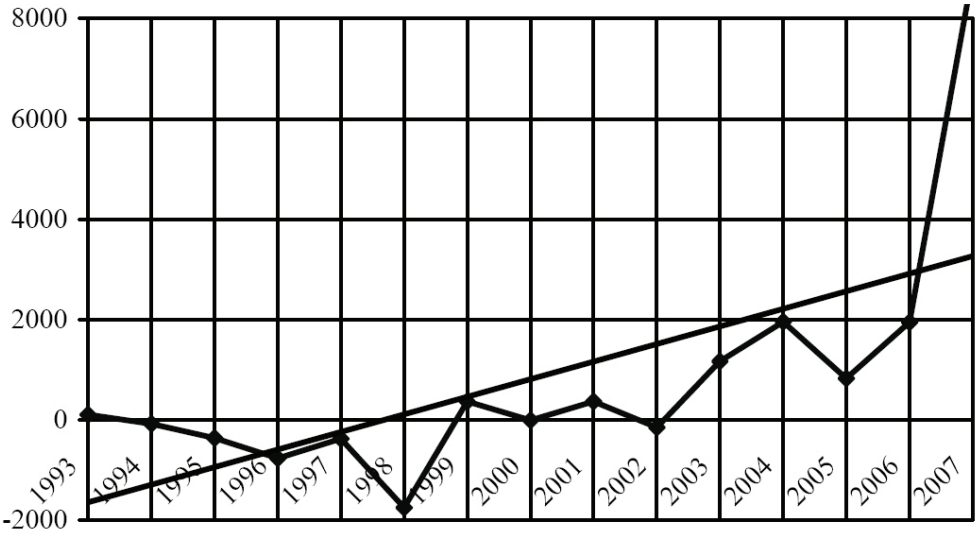
Relative profitability figures are widely used in farming since absolute profit does not allow assessing fully economic results of production. To show profitability we use the level of expenses payback, which is the ratio of income to total production costs. Table 1 shows that the expenses payback increases when the level of absolute profit grows up (i.e. losses are reduced). During 5 recent years the number of enterprises increased where the level of expenses payback is approximately 130%. Stagnation of the average long-term payback is a result of the change of the ratio of revenue to expenses. Consequently the amount of profit per ruble of expenses is not reduced. It is proved by the difference between the levels of prime mean and weighted arithmetical for both absolute and relative financial results caused by the covariation value. Covariation is usually positive, which indicates the production concentration on profitable farms which is more successful from the financial point of view and about the gradual adaptation of a

part of agricultural enterprises to market conditions of managing.

Indicators of fluctuation ($\sqrt{\sigma^2}$, $\sigma^2$) characterize the general variation of the financial results, caused by all factors operating in economic system which can be divided conditionally into two groups: not dependent on the person and anthropogenous factors. In annual fluctuation of the results of activity of the agricultural enterprises of area the role of casual (mostly meteorological) factors was measured basically during the period from 1993 to 2007 98-99 %. In accordance with this, the share of anthropogenous factors is measured from 1-2 %. Unlike a tendency of dynamics connected with the action of the long existing reasons and conditions of development, fluctuations are caused by the action of the short-term or cyclic factors influencing separate levels of a number and rejecting them from a tendency in one or in the other direction.

Tendencies and profit fluctuations in calculation for one agricultural enterprise of area are presented on fig. 2.

*Figure 2. - Profit dynamics in calculation for 1 agricultural enterprise in the Saratov region, thousands of rubles.*




In measurement of a tendency of dynamics of profit (loss) the fluctuation of levels played only a role of hindrances, «information noise» from which you'd better abstract. Peak fluctuations of financial results are economically extremely undesirable, as they interfere normal functioning of the agro-industrial complex. For the revealing of type of fluctuations we will define the factor of auto-correlation of deviations from a trend - it is equal 0,104. The received value tells about the casual-distributed fluctuations in time (factors are close to zero, and signs on deviations alternate chaotically and number of positive deviations is close to the number of negative). These are irregular, chaotic fluctuations can arise at an interference (imposing) of a set of fluctuations with cycles different in duration or as a result of the same chaotic fluctuation of the deposits' sum, air temperatures etc.

## Conclusion

The variation factor characterizes levels' fluctuation, without reflecting their evolution. For the estimation of stability of dynamics of a studied sign we used the factor of correlation of Spirmen's ranks. It can accept values in limits from 0 to ± 1. The more close the factor to + 1, the more close growth of levels of a number to continuous, hence, above stability of growth; the more close to-1, the more stable decrease in a studied indicator; at value of factor of equal 0 changes are unstable.

So, the dynamics of the financial results of activity of the agricultural enterprises during the period 1993-1997 is characterized by weak decrease of studied indicators (P profit = -0,087, P compensated expenses = -0,062). During the next years, there occur essential positive changes: stability of growth of financial results of activity of the agricultural enterprises is clearly seen, and, according to the value of indicators is accurately traced, stability of growth of profit can be characterized as appreciable ($\rho$ =0,508 and 0,515), and an economic return – as moderated ($\rho$ =0,314 and 0,519).

As a result for the period from 1993 for 2007 positive financial results have been noted in 31 areas at agricultural enterprises. And only in 7 from 38 areas it was not possible to cover cumulative costs for last 15 years a gain from production realization (works, services). At an estimation of stability of dynamics of financial results, following results have been received: in 21 area "strong" stability of growth economic indicators (the factor of correlation of ranks accepts values from +0,7 to +1,0) is traced; in 16 areas– as "appreciable" (factor of correlation of ranks from +0,5 to +0,7) and only in 1 area (Fig. 3).

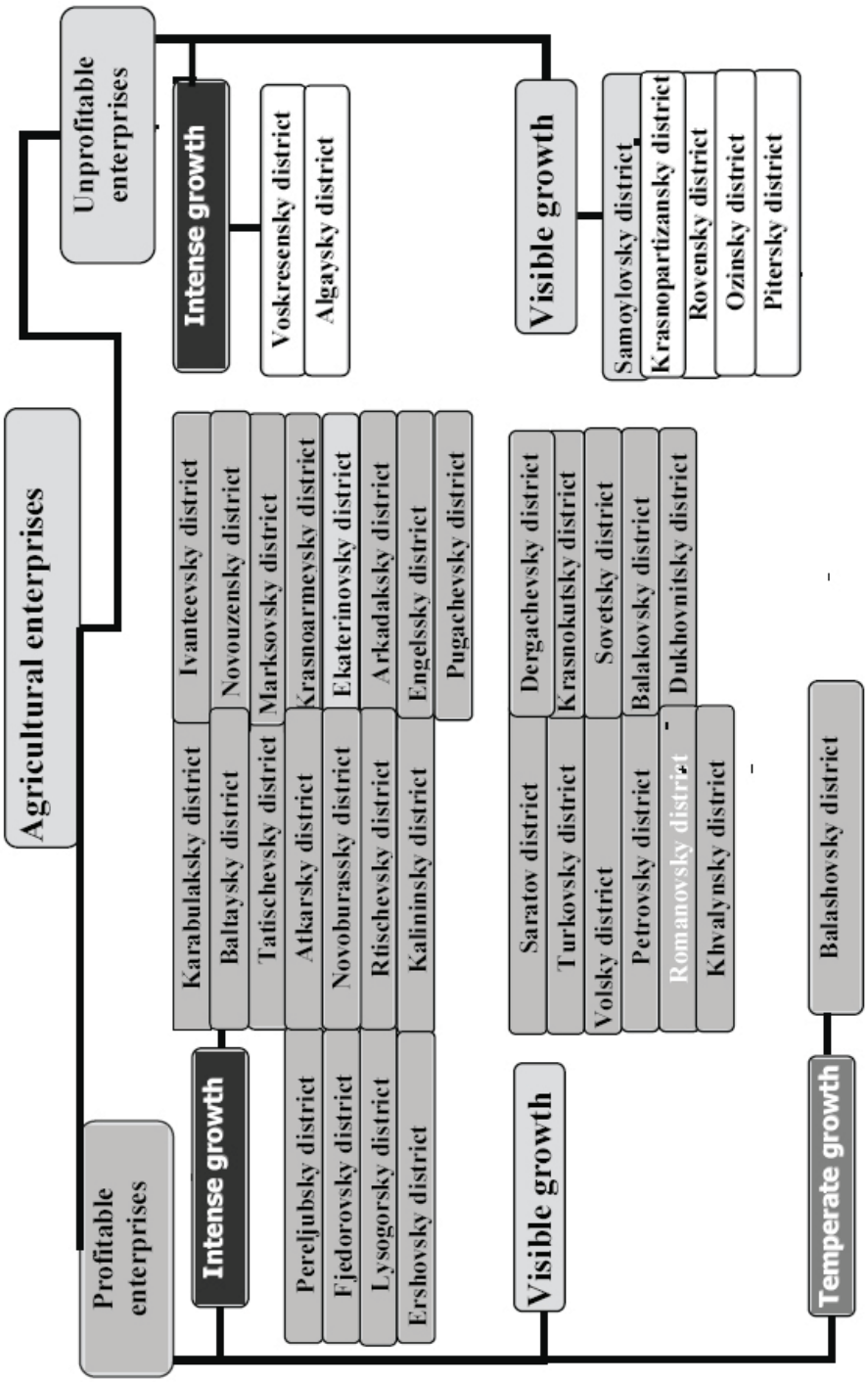



*Figure 3. Distribution of the agricultural enterprises in Saratov region according to the stability level in 2003-2007*

Analyzing these data we are sure that even minor positive changes of the economic conditions promote improvement of the financial results in enterprises activity, considerably raising their stability. By all means, agricultural enterprises stability rising in Saratov region depends on a diversity of problems solution, the special role belonging to the investment process mainstreaming in agrarian sector, to our opinion.

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Economics of agriculture
SI – 2
UDK: 631.1 (470)

# THE STUDY OF RUSSIAN AGRIBUSINESS DEVELOPMENT FACTORS APPLYING STATISTICAL MODELS1

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## Abstract

*The dynamics of Russian agribusiness on the basis of the dynamics of agricultural production is overviewed in the article. Using these statistical models the author studies the factors affecting the development of Russian agribusiness.*
***Key words:*** *innovative constituent, agribusiness development, Cobb – Douglas models, Russia.*

## Introduction

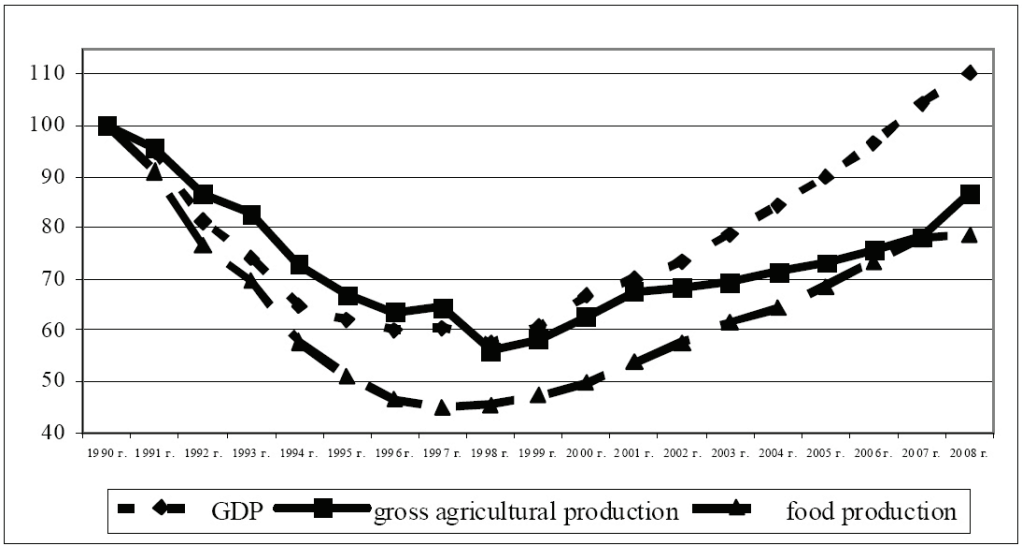
aving looked upon Russian agricultural development dynamics over the last decades one may mark 2 essentially different stages of its production decrease.

Before 1999 agriculture found itself in transformational crisis, accompanied by the redivision of institutional industry's structure, elimination out of economic turnover, main economic indicators, decreasing of production factors, state support and growing competition together with agricultural raw materials import and processed production.(figure1)

1 Under financial support: Russian Federation President's Grant for young scientists support MK-638.2009.6

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*Figure 1. - Agribusiness development dynamics of Russian Federation [3]*




Average yearly damp rates during this period constituted more than 6 per cent. Beginning after the default of 1998 the period of stable growth was characteristic of all economic spheres of agro production sector as well. Nevertheless, average year growth rates of agricultural production were 2,3 per cent lower than GDP what stipulated inaccessibility of prereform development level. Given dynamics witnesses, firstly, the development of agribusiness has more inertia character, secondly, specific conditions and growth barriers.

## Applied methodology

In order to study Russian agribusiness development factors and estimate the innovative constituent several different as for parameters used and the ways of econometric models assessments were built by the author of the article and the best one was chosen.

In the calculations there were used different combinations of such growth factors as the number of work force employed in agriculture, the cost of fixed production funds, the size of investments into the fixed capital stock, weather conditions (for the quantities estimation of this factor the grains yielding capacity indicator has been chosen), the level of state support (estimated by consolidated budget spending indicator in agriculture). In the models described characteristic feature was gross agricultural production output, the dynamics of which was considered as agrarian sector economic growth.

## Researching results with discussion

To study Russian agribusiness development factors and estimate its innovative constituent the author built several different models as for parameters and evaluation means used. The best one has been chosen. (Table1).

*Table 1- Models' characteristics on the estimation of Russian agricultural economic growth factors*

| № | Model | Equation | Regression statistics |
|---|---|---|---|
| 1. | Cobb-Douglas function | $Q=28,61*L^{0,47}*K^{0,36}*S^{0,12}$ | $R^2$ - 0,92<br>Standard error - 0,31<br>Observation - 76 |
| 2. | Solow model | Q=18,81+1,51L+0,11K+0.49Y | $R^2$ - 0,84<br>Standard error. - 94,87<br>Observation - 10 |

The first variant of calculations was based on building up of modified (taking into the account agricultural production specifics) production function of Cobb-Douglas. The analysis was conducted on the territorial survey data using indicators of 76 Russian Federation subjects: Q – gross agricultural production output, mln. rubles; L – annual number of employed, thousand men; K –fixed capital assets, mln. rubles; S – agricultural lands' square, thousand hectars. Coefficient of multiple regression $R^2$ in the model confirms a very high degree of resultant feature connection with factor feature. Acquired link equation shows that 1 % increase in labor costs results in 0,47 % agricultural production volume increment, the same figure in capital inputs increase promotes 0,36 % output rise, 1% land resources increase correspondingly leads to 0,12% gross output production increase. As the sum of degree indicators is less than 1 (0,95), this means that simultaneous factors' increase per 1% leads to gross output increase up to 0,95%, that is, has decreasing payback. The coefficients' elasticity comparison model in agriculture with analogical industrial indicators shows that capital-labor ratio in the former has lower capital endowment, its productivity as well as in industry grows slower than capital endowment, but is less dependent of its dynamics.

As one of the ways of determining the sources of economic growth neoclassical theory of economic growth by R.Solow is traditionally used [6]. In accordance with the above mentioned theory, the part of output growth rate, which can't be explained by the alteration of costs of production factors (labor and capital) is called Solow's remainder and includes into itself together with a lot of other things the influence of scientific technical progress [1]. The author made the second variant of calculations which is given in the table 1. All the variants were statistically important. But the best from the point of view of regression statistics and meeting the sustainability and evaluation shift criteria should be recognized Solow model's modification. The model represents time survey data with the use of 1999-200 indicators where Q –gross output production indicator, mln. rubles; L – annual number of employed, thousand men; K –fixed capital assets, mln. rubles; Y –grain yields capacity as indirect indicator of weather conditions influence.

## Conclusion

Conducted calculations made it possible to formulate the following deductions as regards characteristics of the Russian agribusiness growth type:

- Its extensive character, when the growth of production output is caused by the growth of the main factors;
- Changes in the results of agribusiness sphere activities were mainly because of the input of labor resources. Scientific technical progress and fixed assets indicators have reciprocal ratio connection with resulting feature;
- Favorable weather conditions influenced most of all agricultural growth during the last decade;
- Ranging according to significance of the impact on economic growth in agrarian sphere of all factors examined showed that essential influence on economic dynamics is made by the level of governmental support (elasticity coefficient is three times higher than fixed assets elasticity).

Thus, calculations prove that Russian agribusiness despite last decade positive dynamics has very low economic growth qualitative indicators. Even taking into account the difficulties in defining of scientific technical potential in agriculture, indirect evaluation proves the lack of innovative constituent in the developmental dynamics. It requires all-round restructuring of industry's innovative system including the system of new knowledge generation, distributing innovations, information-consulting provision to overcome this unfavorable situation.

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Economics of agriculture
SI – 2
UDK: 631.15 (497.11)

# PROBLEMS IN ORGANIZATION OF AGRARIAN INDUSTRY PRODUCTION IN SERBIA IN TRANSITION PERIOD[1]

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## Abstract

*The aim of this work is to highlight the problems of organizing agrarian industry production in the period of transition in Serbia. It starts from favorable natural conditions for production and it points the need for a consistent agrarian policy. Details are focused on the problem of organizing the production and on the main aspects of the process.*
***Key words**: Intensive agrarian industry production, transition, agricultural enterprises, agricultural companies*

## Introduction

Serbia has a great potential in agrarian industry sector, which is not fully exploited. With adequate agricultural policy, agriculture can make a significant contribution to economic development of country. It is, due to its connection and influence on other sectors, extremely important for the development of Serbia. Besides that it employs, directly or indirectly, a large number of people, providing food security for citizens and contributing to rural development and ecological balance, it takes an important part in foreign trade. [5]

Several factors may have an impact on agricultural production intensiveness. The intensiveness factors of crop production at the national level are primarily the extent of land area per capita, the structure of planting areas, company size, qualified

1 The work is a part of research project no.149007D "Multifunctional Agriculture and Rural Development in the function of inclusion of Serbia into the European Union" funded by the Ministry of Science and Technological Development of Serbia

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5 Cvijanović Drago, Mihailović Branko, Simonović Zoran, 2009, The role and importance of marketing in the development of agricultural sector of Serbia, Institute of Agricultural Economics, Belgrade, 49.

manpower, production costs, demand for agricultural products, parity price, natural conditions, economic conditions, genetic potential, the level of agricultural practices etc. On the intensiveness of livestock production the influence has also arable land per capita, livestock and its structure, actual work, production costs, the parity price of final products and inputs, natural conditions, the level of applied zoo technics, economic conditions etc[6]. In our further presentations we have chosen to process the company size impact on the intensiveness agro industrial production.

A special feature of Serbian agriculture belongs to its dual structure. Almost all countries in transition have entered the reform process with the state-owned agricultural complexes as the sole bearer of agricultural production. The former Yugoslav agriculture, together with Poland is, in that context, an exception. Apart from the state, social owned farms, the activity of our agrarian sector was based on functioning of individual farms.

The majority of agriculture private sector in total funds should further support the attitude that time-demanding endeavors will not result a significant drop in agricultural production. So, the basic starting point in the transformation of agricultural production in Serbia should be reflected in better organization of agricultural production in the individual (private) agricultural holdings and in successful privatization of former PIK-s. The increase in agricultural production could be affected by improving cross-border Cooperation of certain geographic areas in Serbia with areas in the region.[7]

## Transition problems of agro-system

Transition in agriculture, in its true meaning, has begun to be implemented in Serbia after the year of 2000. Our country is, in comparison to other former socialist countries, with "delay" entered the reform processes related to market model construction of agribusiness functioning. Transitional developments in agricultural sector of Serbia, concerning their market reform, are a kind of transition of state-owned agricultural complexes from a planned economy to a market economy. In the early year of 2000. the structure of the entire ownership over the basic resource of agricultural production " by land" in Serbia, was following:

1. agricultural complexes owned 600,000 ha of cultivated land,
2. 3.6 million hectares (85% of the total arable land was in the ownership of family farms),
3. agricultural cooperatives held in their own property about 140,000 hectares or 3% of arable land.[8]

6 Đekić Snežana, 2010, Agricultural management, Faculty of Economics, Niš, 147.

7 Stojanović Zaklina Manić Emilija, 2009, Cross-border Cooperation, protected geografic areas and extensive agricultural production in Serbia, European Association of Agricultural Economists, Institute of Agricultural Economics Belgrade, 397-404.

8 Zakić Zorka, Stojanović Žaklina, 2008, Economics of agriculture, the same, CID Faculty of Economics, Belgrade, 303.

The participation of private sector majority in agriculture in total funds leads us to conclusion that demanding reform effort and the transition will not lead to a significant decline of agricultural production. The transition process primarily depends on extent and dynamics of reforms.

Transitional reforms in Serbian agricultural sector are:

1. Liberalization of prices and markets as well as establishing the conditions for market economy
2. Land reform and privatization of agricultural land,
3. Privatization and de-monopolization of agricultural processing industries,
4. The constitution of the financial system that is oriented to a market agriculture
5. Institution and administrative system construction that is suitable for functioning of privately owned farms in market economy. [9]

Adoption of European and world business criteria are the best way of competitiveness and economy subjects training in agricultural policy. According to new definition of productivity, there are no good or bad economic sectors. Now, companies in each industry branches can become more productive through the use of sophisticated strategies and investment in modern technology. This is exactly what is successful privatization of food industry shown. The drives in which the privatization was completed have, in the meantime, improved standards, technology and work on conquering the market. [10]

## Problems of production organization in agro-industry

If we look at current transition process in agriculture, we can notice that it affected the whole agricultural complex. State farms, AIK and PIK, are being privatized in the process, or have already been privatized. Family farms are transformed into small and medium enterprises in agriculture or are reduced to homestead. Crossing the Serbian agriculture to a market economy is slowly entering the final phase in our country.

Changes in the organizational structure of AIK's we can best follow up on the basis of reducing the number of agricultural organizations according to the size of estates and on the basis of data about the number of companies engaged in agriculture, as well as the number of employees in these companies.

The number of agricultural organizations, by the size of property, we will observe in the period that begins 1991. and ends in 2007. (Table 1).

9 Gajić Milivoj, Lovre Koviljko, Zekić Stanislav, 2005, Enlargement og the European Union and agriculture, Institutional reforms and agrarian transition in Republic of Serbia, University of Belgrade, Faculty of Economics, 108.

10 Pejanović Radovan Njegovan Zoran, Tica Nedeljko, 2007, Transition, rural development and agricultural policy, Faculty of Agriculture, Novi Sad, 198.

*Table1: Agricultural organizations by the size of estates*

| | Total | Without land | Up to 50 ha | 51-100 | 101-300 | 301-500 | 501-1000 | 1001-2500 | 2501-5000 | Over 5000 ha |
|---|---|---|---|---|---|---|---|---|---|---|
| **REPUBLIC OF SERBIA** | | | | | | | | | | |
| 1991 | 1474 | | 815 | 101 | 130 | 60 | 86 | 149 | 90 | 43 |
| 1996 | 1414 | 620 | 175 | 80 | 129 | 59 | 91 | 145 | 80 | 35 |
| 2001 | 1109 | 405 | 137 | 73 | 121 | 62 | 92 | 122 | 72 | 25 |
| 2006 | 903 | 199 | 145 | 76 | 129 | 60 | 90 | 118 | 67 | 19 |
| **2007** | **833** | **187** | **133** | **63** | **121** | **70** | **77** | **117** | **49** | **16** |

*Source: Statistical Yearbook of Serbia for the current year, issued by Statistical Office, Belgrade.*

Our study period covers 15 years. During the reporting period, a situation analysis of number of agricultural organizations in the period before and during the transition, has been done. The main characteristic of this period was that there was a reduction in the total number of agricultural organizations according to the size of estate. The first year that was took under analysis, as we said before, was 1991., the year in which a total of 1474 agricultural organizations was registered. The final year of observations was 2007. in which 833 agricultural organizations was registered. On the basis of these data we can see that, in this period, 641 agricultural organizations were shut down. The greatest number of agricultural organizations was shut down in the period from 2001. to 2007. If we look at agricultural organizations by size of land holdings, we can notice that the highest decreases occurred in those agricultural organizations that have possession of up to 50 hectares. The number of these organizations was 815 in 1991. it remains only 133 of them in 2007. The number of organizations, that have a surface area between 51 and 100 ha, has also been reduced. So that number of these organizations was 101 in 1991, and only 63 in 2007. There have been only few cases in reducing the number of organizations that have a surface area of 101 to 300 ha. There were 130 organizations of the kind in 1991. and only 121 remained in 2007.[11] Based on the above stated, we can see that a decrease in the number of agricultural organizations was directly affected by the transition. It turns out that a more intensive agricultural production can not be realized in the transition period. The analysis, based on varying the number of estates, shows that transition process has affected all categories of estates having on mind their size. This is significant because it indicates the consistency of transition process in Serbia, which is important for agricultural policy.

Agricultural enterprises by type of ownership are given in Table 2. On the basis of the data we can see changes in the type of ownership, a good example of the transition process. The period we have observed includes three years: 1994. 2001 and 2004. Private agricultural enterprises recorded a slight increase in the first phase of the transition.

11 Statistical Yearbook of Serbia for the current year, issued by Statistical Office, Belgrade.

*Table 2 Agricultural enterprises by the type of ownership in Serbia*

| | 1992 | | 2001 | | 2004 | |
|---|---|---|---|---|---|---|
| | number | % | number | % | number | % |
| Ownership | 4094 | 100,0 | 6845 | 100,0 | 7895 | 100,0 |
| Corporate | 432 | 10,6 | 458 | 6,7 | 361 | 4,6 |
| Private | 2315 | 56,4 | 4349 | 63,6 | 4974 | 63,0 |
| Cooperative | 1140 | 27,9 | 1761 | 25,7 | 2235 | 28,3 |
| Mixed | 207 | 5,1 | 199 | 2,9 | 222 | 2,8 |
| State | - | - | 78 | 1,1 | 103 | 1,3 |

*Source: Statistical Yearbook of Serbia for the current year, issued by Statistical Office, Belgrade.*

This trend indicates us the fact that private enterprises are becoming dominant form of ownership. In support of this claim are facts dating from 2001. when there were 4349, and in 2004. 4974 such enterprises. On the other side, we have a constant erosion of agricultural companies in public ownership. In the year 2001. only 458 companies were registered, and that number reduced in 2004. on 361. As a positive tendency, we may emphasize a growth of agricultural enterprises number in the cooperative ownership - 1761 in 2001.up to 2235 as there were 2004. These data indicate the fact that the increase in number of private and cooperative owned enterprises is not only the result of transition process but also the result of investments presence and new enterprises establishment.

*Table 3 Agricultural enterprises by type in Serbia*

| | 2001 | % | 2004 | % | 2006 | % |
|---|---|---|---|---|---|---|
| **Type total** | **6845** | **100,0** | **7895** | **100,0** | **4161** | **100,0** |
| Public companies | 28 | 0,4 | 31 | 0,4 | 34 | 0,8 |
| Partnerships | 208 | 3,0 | 486 | 6,2 | 252 | 6,1 |
| Joint stock companies | 151 | 2,2 | 221 | 2,8 | 169 | 4,1 |
| Corporate enterprises | 298 | 4,4 | 233 | 3,0 | 175 | 4,2 |
| Private enterprises | 2310 | 33,8 | 2183 | 27,5 | 37 | 0,9 |
| Joint stock company | 0 | 0,0 | 0 | 0,0 | 0 | 0,0 |
| Limited liability companies | 1235 | 18,0 | 1264 | 16,0 | 1170 | 28,1 |
| Single-member limited liability companies | 673 | 9,8 | 1018 | 12,9 | 38 | 0,9 |
| Limited partnerships | 33 | 0,5 | 70 | 0,9 | 39 | 0,9 |
| Cooperatives | 1741 | 25,4 | 2216 | 28,1 | 2108 | 50,7 |
| Facilities | 107 | 1,6 | 112 | 1,4 | 107 | 2,6 |
| Other forms of association | 61 | 0,9 | 61 | 0,8 | 30 | 0,7 |

*Source: Statistical Yearbook of Serbia for the current year, issued by Statistical Office, Belgrade.*

The situation is similar if agricultural enterprises are observed according to the type. According to table 3. there is no agricultural company constituted as a joint stock company. The number of public enterprises in observed period from 2001. to 2006. year has increased from 28 to 34. In this period there has been an overall reduction in the number of companies. If we observe the total number of companies, then in 2004. there were 7895 companies, and in 2006., 4161. The largest reduction occurred in private agricultural enterprises. In 2004 there were 2,183 private companies, in 2006. the number has reduced to only 37. The reason for such a huge reduction in the number of private agricultural enterprises should be sought in the registration process of such companies. For the observed period in 2001. and 2004., committed commercial courts have been doing registration of companies, and registration in 2006. year has been accomplished by the Agency for Business Registers. The presence of agricultural enterprises with foreign capital in Serbia is very small. Feel free to say almost insignificant. This kind of companies, according to Table 4. in the year 1992., there were five, and in the year 2004. a number of them was 27. Slightly better position have companies that have a mixed capital. A number of such companies in 1992. was 17, and in 2004. there were 71 of them.

*Table 4 Agricultural enterprises by origin of capital in Serbia*

| | 1992 | | 2001 | | **2004** | |
|---|---|---|---|---|---|---|
| | number | % | number | % | number | **%** |
| The origin of capital | 4094 | 100,0 | 6845 | 100,0 | 7895 | **100,0** |
| Domestic | 4072 | 99,5 | 6784 | 99,1 | 7797 | **98,8** |
| Foreign | 5 | 0,1 | 14 | 0,2 | 27 | **0,3** |
| **Mixed** | **17** | **0,4** | **47** | **0,7** | **71** | **0,9** |

*Source: Statistical Yearbook of Serbia for the current year, issued by Statistical Office, Belgrade.*

Number of employees, during the period from 1991. to 2006. , have had a trend of steady decline (Table 5). During 1991. on the whole territory of Serbia there were 116,958 persons employed in agricultural enterprises and cooperatives. A number of employees has gradually being reduced throughout this 15 year period. Drastic reduction continued in 2007. too. This year, the number of persons employed in agricultural enterprises and cooperatives was 35,525 employees.

*Table 5. Employed in agricultural organizations (on 31. 12. 2006.)*

| Year | Number of valuable agricultural companies and land cooperatives | Workers employed | Regular workers in the agricultural sector | Agricultural experts | | Veterinarians | Economy experts | |
|---|---|---|---|---|---|---|---|---|
| | | | | With faculty or academy | With high school | | With faculty or academy | With high school |
| **REPUBLIC OF SERBIA** | | | | | | | | |
| 1991 | 1487 | 116958 | 81012 | 6525 | 11202 | 3019 | 2012 | 8328 |
| 1996 | 1414 | 93567 | 64129 | 5246 | 9314 | 2794 | 1680 | 6576 |
| 2001 | 1109 | 70860 | 49371 | 4246 | 7142 | 2491 | 1172 | 4670 |
| 2006 | 903 | 39898 | 33548 | 2533 | 3970 | 1960 | 785 | 2365 |
| **2007** | **833** | **35525** | **30055** | **2435** | **3633** | **1834** | **711** | **2112** |

*Source: Statistical Yearbook of Serbia for the current year, issued by Statistical Office, Belgrade.*

Large part of staff reduction in agricultural enterprises and cooperatives took place in the period from 2001. to 2007. From 2001., when there was 70,860 employees, to 2007., almost half of workers that worked were discharged or left work in these companies. And in the next, 2008, year, downward trend in the manpower has been continued.

According to data in the table, in all observed period, more workers were employed in Vojvodina than in Central Serbia. This is logical in any sense because Vojvodina has better agricultural conditions in every respect. The largest corporate agricultural AIK-s and PIC-s were located right on the territory of Vojvodina.

## Conclusion

The problems that we`re dealing with in this work and the solutions that we`re pointing are next: the transition process is in full swing, and is completed at some forms of social estates or is in the final stage. All this can be seen from the tables given in text.

Opportunities for intensive agro-industrial production in Serbia are certainly there. Upon completion of transition and by greater investment in agricultural production, conditions can be created for it. The state, by creating more favorable business environment, has much to do in the development of agricultural intensive production. In European Union countries mainly affect the development of this branch of industry. Finally, the policy, that prevailed in recent decades, should be left for being related to neglect of agro production. We must not forget that agro-industrial production represents our future and our opportunity.

Our analysis shows that the problems of organizing the agrarian industry production are complex and are related to problems of transition as well as to need for consistent agricultural policy which should contribute to a better success of this production.

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Economics of agriculture
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UDK: 332.2.021 (470)

# AGRICULTURAL POLICY OF THE RUSSIAN FEDERATION

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## *Abstract*

*State support for the agricultural sector is an important national economic problem, since agriculture is one of the sectors, which has traditionally built the entire Russian economy, and this machinery, the consumption of petroleum products (diesel fuel), transportation, storage, processing, etc.*
***Key words:*** *Agro industrial complex, state development program, agrarian sector, state support, agriculture, agricultural food complex, agricultural policy, agricultural enterprises*

## Introduction

The agricultural sector has accumulated a lot of problems that are particularly exacerbated by the global financial crisis, as agriculture has become most vulnerable to its effects because of their nature of production. Nowadays there is a serious government support to Russian economy priority sectors, including agriculture. In this regard, an important national economic task is to ensure efficient implementation of the State Agricultural Development Program and the markets regulation for agricultural products, raw materials and food for the years 2008-2012

## Discussion

Today the main problems of agrarian sector are: livestock industry remains unprofitable, due to which agricultural producers are forced to reduce the number of animals, not civilized land market, there is a shortage of production facilities for the storage and processing of agricultural products, lack of qualified personnel, lack of young professionals, rising interest rates bank loans, the uncertain intervention policy, the difficulty of subsidy getting, disparity in prices for agricultural products, criminalization of food markets, the of

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unprofitable enterprises number is constantly grow, amount of overdue receivables and payables are increased, increasing number of bankruptcies and attempts raider grabs on agricultural enterprises is increased, all this items are the main problems of the agrarian sector of today. In addition, agriculture dependence of on imported equipment suppliers and technology is constantly increase, there is an import substitution of machine-tractor fleet in agriculture. All this is accompanied by an underdeveloped, outdated infrastructure and inadequate development of advisory service in agriculture.

To develop and to improve agrarian policy should be assumed some measures:

1. It is necessary, to taking into account the principle of co-financing from the federal budget, focused on supporting and strengthening the breeding base for the reproduction of farm animals are the most popular breeds in the province. Support, in the form of subsidies, all forms of agricultural enterprises ownership such as breed plants status, breeders, breeding stations, and breeding enterprise to:

- Maintenance of highly productive pedigree breeding stock for agricultural animals at the statutory rate on one conditional head;
- Maintenance of tribal producers of all agricultural animals types at the statutory rate of one conditional head;
- Young breeders of all agricultural animals types, realized by agricultural enterprises, peasant (farmer) farms at the stationary rate of 1 kg of live weight, young breeder birds sold per head of breeding eggs in 1000, the seed breeding bulls, breeding sheep, breeding boars - a rate of one semen dose ;
- Immunogenetic study of breeding animals in accredited laboratories, acknowledging receipt of a viable, with high genetic potential of young, counting 30 percent of expenditures for these purposes.

1. We must continue attract regional budgets to ensure agro-industrial complex pedigree livestock under a financial lease (leasing), as the most effective and accessible forms of support.

Applications agricultural enterprises and peasant (farmers') holdings exceed 100 million rubles, and therefore proposed to increase by the year 2009 and subsequent years, special funds for these purposes up to 180 million rubles in Russia's regions.

In view of high prices for breeding products in Russia prevailing and abroad, many agricultural enterprises, especially the peasant (farmer) farms do not have the financial capacity to purchase cattle. In this regard, we offer include compensation costs for agriculture, peasant (individual) farms, breeding enterprise of the territory are 25 - 30 percent of the value of breeding livestock acquired for breeding in breeding farms and reproducers region and other regions of the Russian Federation, as well as for imports. This will significantly increase the proportion of highly productive cattle in the province.

2. It is necessary to stabilize the grain market. To achieve this goal, the following tasks should be done:

- Smoothing of seasonal fluctuations in prices for grain and its products to grain

producers and consumers;
- To increase the agricultural producers income;
- Grain movement Stimulation from the remote regions of the Russian Federation in the region of consumption;
- To make more understandable and predictable intervention for domestic agricultural producers, as well as for the year to determine a minimum price for agricultural products. This will serve as a guide for producers in forming their own costs and thereby ensure a stable supply and price of domestic agricultural products.

3. For modernization and small-scale production growing, as well as creating stable and competitive environment in the countryside, we offer the following key activities aimed at improving the mechanisms for implementing the State program of agricultural development and agricultural products markets regulation, raw materials and food:
- Increase and reduce the price to attract credit resources to (F) X, and created agricultural consumer cooperatives, which would increase commodity production and incomes of people employed in them.
- To modernize and develop procurement, supply and marketing infrastructure network of agricultural consumer cooperatives.

4. A good solution for simplifying the mechanism, applying for grants is that the recipient of grants was a bank or credit cooperative, which gives smallholders loans at an interest rate reduced by the amount owed to the grant. Then the credit institution on the basis of the available documents could make out a roster of subsidy to all borrowers and submit it to the Ministry of Agriculture for grants owed.

5. Empowering and improving the marketing of products LPH, guarantees the municipal and public authorities, the subsidies payment on agricultural products. In the markets in the regions to local agricultural producers should be provided on a mandatory basis trading places and provide an opportunity to sell in the auto store without special permits and licenses, and cooperatives purchasing products, may create their own cooperative markets.

6. Cooperation Development in the Russian agricultural sector is imperfective and is greatly influenced by the legal framework on land tenure and land use, taxation, promotion of cooperative development, financing regional programs of development cooperation. All this requires amending the existing laws, policy adjustment at the federal and regional levels in the area of pricing, preferential lending cooperatives and cooperatives exemption for 15 years, paying taxes, development of market infrastructure, development of strategic directions of modernization and development of logistics industry agribusiness

7. The main part of young families are not benefiting from assistance in improving their housing conditions within the state program were young professionals and members of young families whose average age was 27 - 28 years old, of which only have enough money to buy basic necessities and products. The main reasons for not participating in the State program are the lack

of funds for the payment of its share in the construction and difficult procedure of registration documents. It is proposed to cancel the initial payment for young families living in rural areas.

8. To solve the financial problems in agriculture to make interest-free loans for agricultural development, to prohibit the issuance of loans tied to foreign currency, state-subsidized purchase of equipment and resources invented only in the Russian Federation.

## Results

If we look at scenarios for the agro-products sector of Russia it will be concluded that:

1. Promising innovation is the only breakthrough scenario. In the event of his incarnation in the life of agriculture would get a much-needed impetus to the innovation development ,will increase the need for large and medium producers in the high results of breeding and genetic research in new technologies.
2. However, to this scenario becomes a reality, we must work hard: to create industrial and social infrastructure of the village, to conduct an active and systematic agricultural policy. Financial and organizational support of the state and the effective operation of market mechanisms will take agriculture out of the crisis in the next five years to over the next decade and a half to create a steadily growing and competitive agricultural sector.
3. Inertial scenario would jeopardize the country's food security, will lead to complete degradation of agriculture and reduce to a supercritical value of rural population standard of living.
4. As a result, the state of the country's economy deteriorated sharply, which could cause serious social disruption.

## Conclusion

State support for the agricultural sector is an important national economic problem, since agriculture is one of the branches, which has traditionally built the entire Russian economy, and this machinery, the consumption of petroleum products (diesel fuel), transportation, storage, processing, etc. Almost one third of the population to a greater or lesser extent involved in this process. Support and development of the agricultural sector stimulates the entire economy as a whole, provides high employment. This is especially important because in Russia to preserve the traditions of agriculture and high potential for agricultural production for the domestic market and for export.

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UDK: 631.1.017.3:636:658.5.012.7

# SENSITIVE ANALYSIS OF LIVESTOCK BREEDING PRODUCTION ON FAMILY FARMS[1]

*Jonel Subić[2], Lana Ivanović[3], Marko Jeločnik[4]*

## Abstract

*In process of transition of national economy into market economy, agricultural husbandries are adjusting their business activities to suit new economic conditions. So, their goals have shifted significantly: from self-sufficiency towards increased production for market and realization of principles of own profitability.*

*As very complex process, live stock breeding production requires from agriculturalist constant decisions making related to maintaining, or increasing of gained profit on farm. Making of right and timely decisions, is closely related to the possession of appropriate knowledge and skills, necessary information, as well as with proper perceiving and solving of appeared problems.*

*In livestock breeding production the significant source of risks is permanent growth of production costs, parallel with products' prices fall. Hence, it is important to consider the risk of certain productions, where sensitive analysis could provide relevant information.*

*In paperwork are analyzed economic effects of different livestock breeding productions in terms of yields, prices and costs change. On that way is possible to notice which factors affect the most on economic effects within production, as well as which production is more risky.*

***Key words**: sensitive analysis, livestock breeding, agricultural husbandries.*

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1 Paper work is a part of the project researches 149007 Multifunctional agriculture and rural development in function of accession of Republic of Serbia in European Union and 159004 D Accession of Serbian economy into EU – planning and financing of regional and rural development and companies' development policies, financed by the Ministry of Science and Technological Development of Republic of Serbia.

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## Introduction

Livestock breeding already has, and should have in near future, an important role in the structure of national agricultural production potential. In addition to this goes high presence of forage crops, pastures and meadows in the structure of plant production, and traditional agriculture orientation in Central Serbia to cattle breeding.

Independently of limiting market factors, potentials for livestock breeding development are in great portion determined by natural conditions, surface and structure of utilized agricultural land, by form of agricultural production organization, economic and social structure of local population, as well as by achieved level of economic development. Observing natural resources, Republic of Serbia could be described as a rich territory, with significant opportunities for further growth and development of livestock breeding production.

Climatic and soil conditions on the Republic territory are suitable for intensive and cost-effective production of reproductive and fattening animals, what includes milk production (total production in 2009. was around 1.478 million liters of cow's milk)[5] and meat production (total meat production in 2009. was around 457.108 t. From that sum, around 100.199 t were beef meat[6], 252.188 t were pork meat[7], 24.517 t were sheep meat and 80.204 t were poultry meat). In 2009 there was 1.002.000 heads of cattle (548.000 cows, 36.000 in-calf heifers and 199.000 bullocks in process of fattening). In same year, total number of pigs was 3.631.000 heads (474.000 heads of fattened pigs – weight 51-80 kg, 283.000 heads of fattened pigs – weight 81-110 kg and 185.000 heads of fattened pigs – weight over 110 kg).

Focusing on feed, one of the levers for strengthening of livestock breeding production, besides developed maize production (during 2009. production was around 6.396.262 t and harvested area was around 1.208.640 ha) and forage crops production (in 2009. total production was around 2.343.948 t and harvested area was around 350.484 ha), surfaces under meadows (in 2009. harvested area was around 613.630 ha, and total yield was 1.126.239 t) and pastures (in 2009. harvested area was 810.916 ha and total yield achieved 471.043 t) were also available.

Having in mind before all tradition in production, available fodder base, purchasing capacities, consumer centers, export opportunities, existing capacities for cattle breeding and many commercial farms directed to investment, potentials for further development of livestock breeding production still have not been exhausted.

5 Milked cow's milk spent for human alimentation or processing.

6 Except this, it was produced 5.000 t of raw beef fat.

7 Except this, it was produced 30.000 t of raw pork fat.

## Working material and method

In paper were presented calculations under variable costs for different livestock breeding productions, related to reproductive and fattening animals. Accordingly, calculations of production costs were made per one animal for reproduction, and one fattening animal. So, calculations are related to the production of cow's milk (*Simmental type of cattle*) and bullock and pig fattening. Also, contribution margin for afore mentioned lines of livestock breeding production was determined.

Creation of analytical calculation based on variable costs is starting with establishment of achieved production value on market, which is gained as sum of products market price multiply with their quantity. Then, from that value are subtracted variable costs of production. In agricultural production, character of variable costs has: costs of material (seeds, manure and mineral fertilizers, pesticides, feed, etc.), variable costs of machine usage (fuel and lubricant) and variable part of general expenses.

Labor costs, depending on activities organization in company or husbandry, could be observed as fixed or variable cost, so they can be included, or excluded during the determination of contribution margin value. Result of analytical calculation based on variable costs is *contribution margin (gross financial results)*.

Contribution margin is defined as difference between total production value (value of main product increased for the value of by-products and incentives) and proportional variable costs. Contribution margin shows how much financial assets are left for fixed costs covering and realizing of positive financial result, after covering of variable costs.

Calculation based on variable costs enables direct comparing of financial performance of two different lines or phases of production at equal fixed costs, as well as comparison of two or more different intensities of same line or stage of production.

By usage of *sensitive analysis* it was followed for how much contribution margin is decreased due to reduction of yield (or reduction of selling price), or due to growth of variable costs. In this way, was determined what parameter affects more on reduction of contribution margin, or change of which parameter brings to higher risk in livestock breeding production (concretely in milk production and process of bullocks and pigs fattening).

In order to facilitate comparisons of valuable indicators of production, costs and production value are expressed except in *RSD/UM* (or, *RSD/head of animal*) also in official EU currency *EUR/UM (*or, *EUR/head*). For *reproductive animals* base for calculation is one head in period of one year. In *bullocks and pigs fattening*, base for creation of calculation are heads after process of fattening (depending on fattening process duration).

## Results and discussion

According to established methodology, calculations based on variable costs in livestock breeding production are related to: *cow's milk (Simmental breed of cattle*), *bullocks and pig fattening*.

In the structure of calculation model for cow's milk production, variable costs are consisted of next elements *(Table 1.)*: feed (concentrate, corn silage, hay and grazing); veterinary services; straw and other expenses.

*Table 1 – Calculation based on variable costs in cow's milk production*

| Description | Quantum | UM | Coefficient | Price *(RSD/UM)* | Total *(RSD/ head)* | Total *(EUR/head)* |
|---|---|---|---|---|---|---|
| **Production value (I)** | | | | | **164.182,50** | **1.732,30** |
| Milk | 4.500,00 | l | | 27,00 | 121.500,00 | 1.281,96 |
| Calf | 150 | kg | 0,73 | 230,00 | 25.185,00 | 265,73 |
| Extracted cow | 650 | kg | 0,17 | 95,00 | 10.497,50 | 110,75 |
| Incentives | 5.000,00 | l | | 1,40 | 7.000,00 | 73,86 |
| **Variable costs (II)** | | | | | **99.625,00** | **1.051,23** |
| Feed | | | | | 85.625,00 | 903,52 |
| Veterinary services | | | | | 8.000,00 | 84,41 |
| Straw | | | | | 4.000,00 | 42,20 |
| Other expenses | | | | | 2.000,00 | 21,10 |
| **Contribution margin (III=I-II)** | | | | | **64.557,50** | **681,07** |

*Source: Subić, J., Ivanović, L., Jeločnik, M. (2009.): Contribution margin in agricultural production (field research). IAE, Belgrade.*

In following tables are shown contribution margin fall in cow's milk production (due to yield or price falling, or growth of production costs).

*Table 2 - Contribution margin fall in cow's milk production, due to yield or price falling*

| Fall of yield or fall of cow's milk price (%) | Fall of contribution margin in cow's milk production | |
|---|---|---|
| | *(%)* | *(RSD/head)* |
| 5,00 | 9,51 | 57.782,50 |
| 10,00 | 19,03 | 51.707,50 |
| 15,00 | 28,54 | 45.632,50 |
| 20,00 | 38,05 | 39.557,50 |
| 25,00 | 47,57 | 33.482,50 |
| 30,00 | 57,08 | 27.407,50 |
| 35,00 | 66,59 | 21.332,50 |
| 40,00 | 76,11 | 15.257,50 |
| 45,00 | 85,62 | 9.182,50 |
| 50,00 | 95,13 | 3.107,50 |
| 55,00 | - | - |

*Source: According authors calculations*

*Table 3 - Contribution margin fall in cow's milk production, due to growth of production costs*

| Growth of cow's milk production costs *(%)* | Fall of contribution margin in cow's milk production | |
|---|---|---|
| | *(%)* | *(RSD/head)* |
| 5,00 | 7,80 | 58.876,25 |
| 10,00 | 15,60 | 53.895,00 |
| 15,00 | 23,40 | 48.913,75 |
| 20,00 | 31,20 | 43.932,50 |
| 25,00 | 39,00 | 38.951,25 |
| 30,00 | 46,80 | 33.970,00 |
| 35,00 | 54,60 | 28.988,75 |
| 40,00 | 62,40 | 24.007,50 |
| 45,00 | 70,21 | 19.026,25 |
| 50,00 | 78,01 | 14.045,00 |
| 55,00 | 85,81 | 9.063,75 |
| 60,00 | 93,61 | 4.082,50 |
| 65,00 | - | - |

*Source: According authors calculations*

From the tables presented above, it can be seen that contribution margin in cow's milk production is more sensitive on the yield and price fall, than on growth of

production costs.[8]

In the structure of calculation model for bullocks fattening, variable costs are consisted of next elements *(Table 4.)*: calf; feed (alfalfa hay, mixture for heads up to 250 kg and mixture for heads over 250 kg); veterinary services and other expenses.

*Table 4 - Calculation based on variable costs in bullocks fattening*

| Description | Quantum | UM | Price *(RSD/ UM)* | Total *(RSD/ head)* | Total *(EUR/head)* |
|---|---|---|---|---|---|
| **Production value (I)** | | | | **72.000,00** | **759,65** |
| Fattened head | 450 | kg | 160 | 72.000,00 | 759,65 |
| Incentives | | | | 0,00 | 0,00 |
| **Variable costs (II)** | | | | **54.837,60** | **578,58** |
| Calf | 150 | kg | 260 | 39.000,00 | 411,48 |
| Feed | | | | 13.098,40 | 138,20 |
| Veterinary services | | | | 969,6 | 10,23 |
| Other expenses | | | | 977,6 | 18,67 |
| **(III=I-II) Contribution margin** | | | | **17.162,40** | **181,08** |

*Source: Subić, J., Ivanović, L., Jeločnik, M. (2009.): Contribution margin in agricultural production (field research). IAE, Belgrade.*

In following tables is presented fall of contribution margin in bullocks fattening (*due to due to yield or price falling or growth of production costs*).

*Table 5 - Contribution margin fall in bullocks fattening, due to yield or price falling*

| Fall of yield or fall of fattened head price *(%)* | Fall of contribution margin in bullocks fattening | |
|---|---|---|
| | *(%)* | *(RSD/head)* |
| 5,00 | 20,98 | 13.562,40 |
| 10,00 | 41,95 | 9.962,40 |
| 15,00 | 62,93 | 6.362,40 |
| 20,00 | 83,90 | 2.762,40 |
| 25,00 | | - |

*Source: According authors calculations*

8 Dashes in tables indicate negative contribution margin (case in which achieved production value is lower than sum of variable costs).

*Table 6 - Contribution margin fall in bullocks fattening, due to growth of production costs*

| **Growth of production costs of fattened head *(%)*** | **Fall of contribution margin in bullocks fattening** | |
|---|---|---|
| | ***(%)*** | ***(RSD/head)*** |
| 5,00 | 15,98 | 14.420,52 |
| 10,00 | 31,95 | 11.678,64 |
| 15,00 | 47,93 | 8.936,76 |
| 20,00 | 63,9 | 6.194,88 |
| 25,00 | 79,88 | 3.453,00 |
| 30,00 | 95,86 | 711,12 |
| 35,00 | | - |

*Source: According authors calculations*

From the tables presented above, it can be seen that contribution margin in bullocks fattening is also more sensitive on the yield and price fall, than on growth of production costs.

I n the structure of calculation model for pigs fattening, variable costs are consisted of next elements *(Table 7.)*: piglet; feed (concentrate I for heads from 25 to 60 kg; concentrate II for heads from 60 to 110 kg); veterinary services and other expenses.

*Table 7 - Calculation based on variable costs in pigs fattening*

| **Description** | **Quantum** | **UM** | **Price *(RSD/ UM)*** | **Total *(RSD/head)*** | **Total *(EUR/head)*** |
|---|---|---|---|---|---|
| **Production value (I)** | | | | **18.123,60** | **191,22** |
| Fattened head | 110,00 | kg | 164,76 | 18.123,60 | 191,22 |
| Incentives | | | | 0,00 | 0,00 |
| **Variable costs (II)** | | | | **13.509,77** | **142,54** |
| Piglet | 25,00 | kg | 218,07 | 5.451,75 | 57,52 |
| Feed | | | | 7.234,20 | 76,33 |
| Veterinary services | | | | 484,60 | 5,11 |
| Other expenses | | | | 339,22 | 3,58 |
| **(III=I-II) Contribution margin** | | | | **4.613,83** | **48,68** |

*Source: Subić, J., Ivanović, L., Jeločnik, M. (2009.): Contribution margin in agricultural production (field research). IAE, Belgrade.*

In following tables is presented fall of contribution margin in pigs fattening (*due to due to yield or price falling or growth of production costs*).

***Table 8** - Contribution margin fall in pigs fattening, due to yield or price falling*

| Fall of yield or fall of fattened head price *(%)* | Fall of contribution margin in pigs fattening | |
|---|---|---|
| | *(%)* | *(RSD/head)* |
| 5,00 | 19,64 | 3.707,65 |
| 10,00 | 39,28 | 2.801,47 |
| 15,00 | 58,92 | 1.895,29 |
| 20,00 | 78,56 | 989,11 |
| 25,00 | 98,20 | 82,93 |
| 30,00 | | - |

*Source: According authors calculations*

*Table 9 - Contribution margin fall in pigs fattening, due to growth of production costs*

| Growth of production costs of fattened head *(%)* | Fall of contribution margin in pigs fattening | |
|---|---|---|
| | *(%)* | *(RSD/head)* |
| 5,00 | 14,64 | 3.938,34 |
| 10,00 | 29,28 | 3.262,85 |
| 15,00 | 43,92 | 2.587,36 |
| 20,00 | 58,56 | 1.911,87 |
| 25,00 | 73,20 | 1.236,38 |
| 30,00 | 87,84 | 560,89 |
| 35,00 | | - |

*Source: According authors calculations*

From the tables presented above, it can be seen that contribution margin not only in different cattle production lines, but also in pigs fattening is more sensitive on the yield and price fall, than on growth of production costs.

## Conclusion

Summarizing the results that were obtained during the creation of calculations of production costs of certain livestock breeding products (*cow's milk - Simmental breed of cattle* and *heads of fattened bullocks and pigs*), following conclusions can be done:

- In all observed lines of livestock breeding production, contribution margin is more sensitive on yield or price fall, than on costs growth;
- The most risky production is bullocks fattening. After that comes pigs fattening, while at the end is cow's milk production with lowest production risk;
- Lower risk in production of cow's milk is partly result of incentives and their positive effect on increase of total production value;
- High risk in bullocks fattening is dominantly consequence of the incentives absence.

Taking into account the structure of livestock breeding production, husbandry needs and current market conditions, production lines that are less risky has to be chosen, in other words those one whose contribution margin is more flexible on parameters change. In that context, for each livestock breeding production line on family farm, it is necessary to create particular calculation of planned or accomplished production value and costs, in order to extract most profitable production.

Obtained contribution margin is for covering of all fixed costs, and remaining part represents profit realized in given production. Realized profit from the production lines differs among producers and it is conditioned by the sum of fixed costs that burdens business activity of each individual farm. Therefore, in order to achieve much more profit, in the livestock breeding production structure of some family farm should be included those production lines that are obtaining higher contribution margin.

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Economics of agriculture
SI – 2
UDK: 641/642:339.564 (438)

# THE ASSESSMENT OF COMPETITIVENESS OF POLISH FOOD PRODUCERS

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## Abstract

*The purpose of the work is an assessment of the impact of integration with the EU to the competitiveness of Polish producers of the food on the Community market, as well as on markets of the third countries. The competitiveness of Polish food producers in the study is understood as capacity of national food producers to be situated in foreign markets and the capability of developing the effective export. Polish food producers are competitive on the international market and the measures of the discussed competitiveness after the accession to the European Union have improved and the perspectives are good. The most competitive sectors of Polish food economy include meat sector, and fruit-vegetable, confectionery sector, secondary processing of cereals and manufacture of tobacco products. The so-far existing source of comparative advantages in food sector included first of all lower prices and production costs. A significant role in revealing of the discussed advantaged was played by the adaptive processes of food sector to functioning in the market system and good adaptation of our producers to act of the Common European Market.*
***Key words**: competitiveness, food producers, foreign trade, price advantages*

## Introductory comments

Not very long time ago, the competition concerned mainly regional or national markets and the international competition was strongly limited by geographical factors and institutional barriers, created by the particular states or their groups. The recent years, as distinguished by the phenomenon of accelerated systemic transformation as well as by the development of the processes of globalization and international integration have led to diametric change of the existing situation. At present, the competition is extremely seldom limited to a given country

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or geographical region and almost all economic entities must cope with the strong competition having the international nature.

It is evident therefore that Poland – in order to be a rightful partner of other countries, especially of the EU member states and to be able to develop – must be competitive on the international market. Polish economic entities, including Polish food producers should be also competitive – if they want to achieve success – in relation to enterprises, functioning in the Common European Market as well as on the third markets. Such approach to the problems of competition and competitiveness caused that in the studies, conducted by the IAFE-NRI, the competitiveness of Polish food producers is understood as capacity of national food producers to be situated in foreign markets – on the EU market as well as on the third markets and the capability of developing the effective export.

## Methodology of the studies

When assuming the above definition as the basis, for the needs of the evaluation of international competitiveness of Polish food producers after the accession of Poland to the European Union, the analysis of the results of Polish foreign trade of agri-food products in the years 2004–2009 in comparison with the last year before Poland's accession to the European Union, was carried out. Additionally, the analysis of export orientation index for main sections of food industry was conducted. In further part of elaboration, price advantages of Polish food producers as well as export subsidies were discussed.

This study is based on statistical data from the National Research Institute of Agricultural and Food Economics, Central Statistical Office, the Ministry of Agriculture and Rural Development, the Ministry of Finances, Analytical Centre of Customs Administration and Agricultural Market Agency, which were used for the analysis of international competitiveness of Polish food producers.

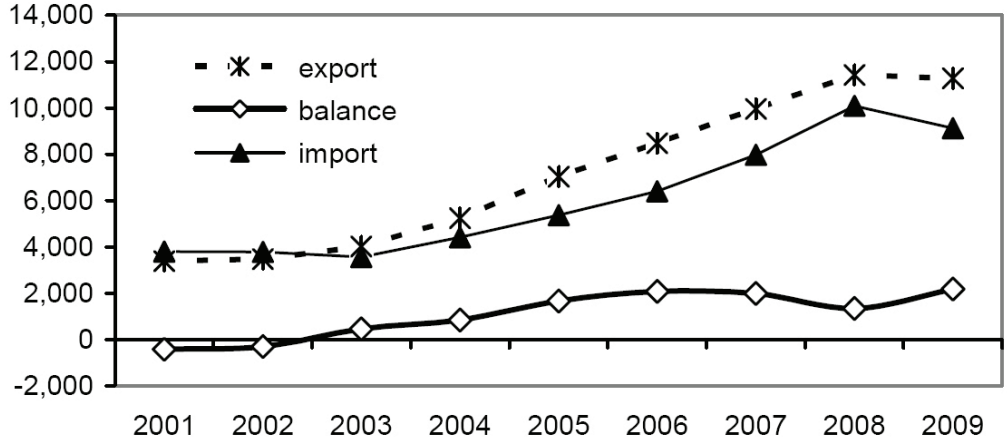
## The results of Polish foreign trade of agri-food products

More than 6 years after the accession of Poland to the European Community, it may be very well visible that the entrance into the CEM (Common European Market) structures occurred to be very favourable for Polish food economy. The results of foreign trade of agri-food products are very good. In spite of different conditions, they support good preparation of the discussed sector to running the activity on CEM and in most of other markets. Food producers successfully utilize competition advantages, having mainly a price nature. A high increase of export of Polish food products has been recorded; it compensated considerably the lower increase of import of the mentioned products. Polish food producers have improved their position in the market of the enlarged EU. Mutual full opening of the markets has become a strong impulse for development of Polish food economy what is confirmed by the results of foreign trade of agri-food products **[3]**.

In the years 2003-2005, value of export of agri-food products increased by more

than 75%. Increase of import was slower; it was increased by more than 51% during the discussed period. Such quick export increase was not a single phenomenon, caused by integration impulse. During the subsequent years, the increase of foreign trade exchange of agri-food products was continued. In 2006, export was increased by almost 21% and import – by ca. 19%. In 2007, further development of our trade exchange was recorded but for the first time, the rate of growth of import was higher as compared to export i.e. export was increased by 17% and import by 25%. The mentioned relation was maintained also in 2008 although indicators of dynamics of export and import growth were somewhat lower than in 2007 and amounted to 15% and 26%, respectively. In 2009 export and import decreased, export by 1%, but import by 10%. During six years of Poland's membership in the Community, export of agri-food products was increased almost three times and import – more than 2.5 times **[1]**.

*Figure 1 - Results of Polish foreign trade of agri-food products (in mln EUR)*




*Source: Foreign trade of agri-food products. Market analyses. No 16-31, IAFE-NRI, AMA, MARD, Warsaw 2002-2010 and unpublished data of CAAC. Own elaboration.*

The trade exchange with EU member states was developing quicker than with the third countries. CEM became the dominating market of supply and sale for Polish agri-food sector as early as during the first year after the accession. During the successive years of our membership, the participation of the EU in export of the discussed group of goods was especially quickly growing – from 65% in 2003 to almost 74% in 2005 and as much as 80% in 2007 – 2009. The participation of the EU in import of agri-food products was more stable and amounted to ca. 61-63% in the years 2003-2006; in 2007, it exceeded 67% and in 2008-2009 it approached 70%. The development of trade exchange with the EU countries concerns not only the EU-15 but also the "new" member states. The membership in the EU gave a very strong and unexpected impulse to trade exchange of Polish agri-food products with the EU-10/12. A part of Polish food market, taken over by the foreign producers, including those from the EU, was considerably smaller than the part of the world and the EU market, gained by Polish producers. In effect, balance of foreign trade of agri-food products in the years 2003-2009 was considerably improved: the total one – from 446 to 2 171 mln EUR and with the EU member states – from 451 to 2 746 mln EUR.

*Table 1 - Results of foreign trade of agri-food products*

| Specification | Values in mln EUR | | | | Dynamics (analogical period of the previous year = 100) | | |
|---|---|---|---|---|---|---|---|
| | 2003 | 2005 | 2007 | 2009 | 2005 | 2007 | 2009 |
| Export of agri-food products | 4003.2 | 7028.0 | 9955.1 | 11281.9 | 134.1 | 117.5 | 98.7 |
| includ. to UE-25/27[a] | 2636.2 | 5190.8 | 8001.4 | 9066.2 | 137.3 | 123.4 | 98.3 |
| toUE-15 | 2042.0 | 4063.0 | 5941.2 | 6698.2 | 136.0 | 120.9 | 100.3 |
| to UE-10/12[a] | 594.2 | 1127.8 | 2060.3 | 2368.0 | 142.1 | 131.6 | 93.2 |
| Import of agri-food products | 3556.7 | 5373.5 | 7972.3 | 9111.1 | 121.9 | 124.7 | 90.3 |
| includ. from UE-25/27[a] | 2185.3 | 3388.1 | 5347.4 | 6320.3 | 122.6 | 133.8 | 90.0 |
| fromUE-15 | 1855.1 | 2938.0 | 4484.6 | 5448.9 | 122.6 | 131.3 | 91.0 |
| from UE-10/12[a] | 330.2 | 450.2 | 862.8 | 871.4 | 122.4 | 148.2 | 83.9 |
| Balance of foreign trade of agri-food products | 446.5 | 1654.5 | 1982.8 | 2170.8 | 198.0 | 95.4 | 162.0 |
| includ. with UE-25/27[a] | 450.9 | 1802.7 | 2654.0 | 2745.9 | 177.1 | 106.8 | 125.1 |
| with UE-15 | 186.9 | 1125.0 | 1456.6 | 1249.3 | 189.9 | 97.1 | 180.7 |
| with UE-10/12[a] | 264.0 | 677.7 | 1197.5 | 1496.6 | 159.2 | 121.8 | 99.5 |

[a] up to 2006 – data for UE-25, from 2007 – for UE-27 (for UE-10 and UE-12, respectively)

*Source: Foreign trade of agri-food products. Market analyses. No 21-31, IAFE - NRI, AMA, MARD, Warsaw 2005-2010 [1] and unpublished data of CAAC. Own elaboration.*

Weaker results of foreign trade of agri-food products in 2009 were the effect of accumulation of many phenomena. They include, of course, world economic crisis but also such phenomena as: appreciation of PLN, quickly proceeding up to a half of 2008; decline of the world prices of agri-food products in the second half of 2008 and in 2009 (after their sudden rise in the season 2007/2008) and depletion of export potential of two sectors, covered with quota on production, i.e. dairy and sugar industries. In spite of somewhat worse results, obtained during the recent year, the profits achieved during the first 6 years of Poland's membership in the Community are very high in the field of foreign trade of agri-food products and are the evidence of high competitiveness of our producers. Liquidation of all trade limitations concerning the access to the EU market occurred therefore *per saldo* favourable for Polish food sector.

The increase of export of agri-food products was mainly determined by a high production of these articles in our country, a high maintained demand on Polish food products in the EU countries and non-EU states as well as favourable prices of agri-food products on foreign markets. Such situation was also affected by export subsidies of which Polish entrepreneurs could take an advantage, after the accession, on equal rights with the EU entrepreneurs. Owing to such support, Polish agri-food products could compete, in respect of price, in the markets of the third states [2].

## Role of export in sales of basic sectors of food industry in Poland

The particular sections of Polish food industry are characterized by very high differentiated competitiveness. Analysis of relations of export's value of basic food products and their selling value, as conducted for the years 2003-2009, indicates that especially strong export orientation was recorded for the following branches of food industry: fish processing, potato processing (including starch production), production of fruit and vegetable juices and drinks, and of the remaining fruit-vegetable products, production of feeds for domestic animals, production of stable confectionery baking products, and of chocolate and other sweets, coffee and tea processing and production of condiments. During the successive years of our membership in the European Union, the mentioned sectors of food production maintained, as a rule, or increased participation of export in the sale of their products [2].

*Table 2 - Participation of export in the production sold of food industry in Poland (%)*

| Basic sectors of food industry | 2003 | 2005 | 2007 | 2009 |
|---|---|---|---|---|
| Fish and fish products | 62.2 | 58.3 | 58.1 | 55.9 |
| Starch and potato products | 30.3 | 41.2 | 35.0 | 31.9 |
| Fruit and vegetable juices and drinks | 42.2 | 39.6 | 33.8 | 34.9 |
| Fruit-vegetable products | 40.8 | 34.9 | 38.7 | 44.1 |
| Feed for domestic animals | 20.9 | 38.1 | 23.8 | 14.5 |
| Stable confectionery baking products | 37.2 | 58.0 | 61.3 | 79.7 |
| Cacao, chocolate and other sweets | 31.8 | 28.1 | 32.1 | 41.2 |
| Tea and coffee | 41.1 | 59.6 | 74.9 | 93.5 |
| Condiments | 21.9 | 28.6 | 24.3 | 17.7 |
| Red and poultry meat and their products | 15.0 | 16.2 | 18.4 | 20.4 |
| Oils, margarine and remaining fats | 7.1 | 20.4 | 32.0 | 31.0 |
| Milk and dairy products | 11.7 | 21.9 | 21.5 | 20.3 |
| Sugar | 14.4 | 20.3 | 13.9 | 13.1 |
| Spirit drinks | 10.8 | 15.4 | 11.1 | 16.0 |
| Tobacco and tobacco products | 13.0 | 23.1 | 49.2 | 86.9 |
| Cereal products | 4.9 | 8.6 | 9.4 | 18.0 |
| Cake products | 4.5 | 11.5 | 13.2 | 5.7 |
| Macaroni | 9.8 | 14.6 | 8.3 | 8.6 |
| Wines | 1.3 | 2.5 | 1.9 | 5.3 |
| Beer and malt | 1.4 | 2.4 | 4.3 | 4.2 |
| Non-alcohol products | 3.4 | 11.0 | 10.4 | 8.9 |

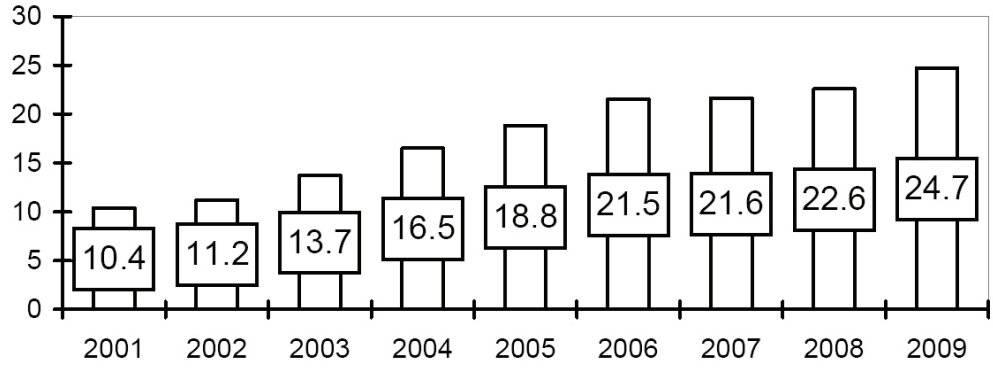
*Source: Unpublished data of GUS and CAAC. Own elaboration.*

Basic sectors of food industry are characterized by export orientation similar to the mean for the whole food industry. They include such sectors of food production as meat processing, production of oils, margarine and the remaining vegetable fats, milk processing and production of sugar, spirit drinks and tobacco products. At the same time, the phenomenon of a meaningful increase of export's participation in sales in a part of the mentioned sectors was recorded in the successive years, what in the future may result in their passage to the groups of sectors with a higher competitiveness.

The following sectors of food industry do not show export orientation features: production of fresh bread, macaroni and cereals products, wine and beer - producing sector and then, also, production of cakes and non-alcohol drinks. However, also in this group of sectors, the phenomenon of growing export orientation was recorded. If the mentioned tendency is maintained, the discussed sectors will also be able to change their place and pass to the group of sectors with the higher competitiveness **[4]**.

The increase of export participation in the sales of the particular sectors of food industry had a direct effect on development of export orientation and competitiveness of the whole Polish food industry. The participation of foreign sale in the total sale of the discussed industry in the years 2003-2007 was increased by almost 8 percentage points. In 2008, almost the whole increase of food industry sale was located in foreign markets and the participation of export in the income form sale of goods and services was increased by one percentage point. In the recent year near 25% of Polish food industry production was found on foreign markets. It is more than twice higher indicator as compared to the period before the entrance of Poland to the EU.

*Figure 2 - Participation of export in the production sold of food industry in Poland, in %*




*Source: Elaboration of R. Urban on the ground of GUS and MARD data.*

Increase of export orientation of the particular food industry sectors and strengthening of the position of our producers on the enlarged European market during the first period of Poland's functioning within the European Community have proved that Polish food producers were well prepared to the membership in the EU and coped perfectly on the mentioned difficult market. The increase of the rating of Polish food producers on the EU would have not occurred if Polish products had not been simply good and relatively cheap, i.e. had not been characterized by a high quality, health safety and taste values and, simultaneously, by a acceptable price.

## Price advantages of Polish food producers

Price advantages represent one of the main sources of the competitiveness of the Polish food sector. Prior to EU accession, those were as follows: ca. 20% in agriculture, ca. 30% in processing and ca. 40% in the case of consumer prices. After joining the EU, Poland retained its advantages, despite a gradual price convergence.

The analysis of the level of and fluctuations in prices for basic agricultural products in Poland and in the European Union in 2004–2009 demonstrated that (Table 3):

- price movements in the domestic market were very similar to those observed in other EU Member States. They tended to follow the same patterns, but their dynamics (both downward and upward) were usually higher in Poland than the European Union average;
- Polish producers of basic agricultural products enjoyed greater price advantages in comparison with their counterparts in the EU-15, and lower than producers in the new Member States;
- in terms of type of production, the level of price competitiveness is higher in markets related to livestock production than in those connected with crop production.

For the time being, it is impossible to establish whether regained comparative advantages of Polish producers are permanent. The slow appreciation of the zloty observed from July 2009 could again undermine Poland's competitive position in the common European market in the future. The lack of distinct price differences between Poland and the Community as well as considerable dependence of comparative advantages on the exchange rate should force domestic producers to seek and make better use of non-price factors influencing the competitive position in the common European market [4].

*Table 3 - Comparison of prices for basic agricultural products in Poland and in the EU-25/27 (EU-25/27 = 100)*

| Product | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| Wheat for human consumption | 93.5 | 87.3 | 97.8 | 98.8 | 101.4 | 90.8 |
| Barley for animal feed | 90.1 | 87.0 | 89.2 | 94.9 | 100.7 | 87.4 |
| Maize for animal feed | 98.4 | 88.9 | 94.8 | 96.6 | 101.4 | 98.5 |
| Pigmeat | 102.1 | 95.6 | 88.9 | 95.0 | 103.3 | 101.1 |
| Piglets | 93.5 | 87.3 | 97.8 | 98.8 | 101.4 | 90.8 |
| Beef | 90.1 | 87.0 | 89.2 | 94.9 | 100.7 | 87.4 |
| Milk | 98.4 | 88.9 | 94.8 | 96.6 | 101.4 | 98.5 |
| Poultrymeat | 102.1 | 95.6 | 88.9 | 95.0 | 103.3 | 101.1 |
| Eggs for human consumption | 93.5 | 87.3 | 97.8 | 98.8 | 101.4 | 90.8 |

*Source: own study based on Ministry of Agriculture and Rural Development data.*

## Export subsidies

The accession of Poland to the European Community gave the possibility of utilizing the CAP mechanisms by the Polish entrepreneurs and tradesmen on the same conditions and principles as the EU businessmen and by this, of refunds to export of certain agricultural products. During the moment of Poland's accession to the EU, i.e. on the 1st day of May 2004, the European Commission used refunds to export of most of agro-food products under the strategic sectors, covered with the common market organizations, i.e. beef and veal, processed pork, poultry and eggs, milk and dairy products, cereals (potato starch), sugar, Non-Annex-I processed products and

fresh fruit and vegetables. Year by year, the level of refunding rates for certain agro-food products was subject to changes, mainly to lowering or suspension to zero what affected the decrease of interest in participation in the discussed mechanism by Polish entrepreneurs. At present, they exist only in export of certain agro-alimentary products to third countries, i.e. beef, pork, poultry and eggs. The sum of refunds, paid by Poland in 2004-2009 in the amount of about 500 million EUR constituted 4% of the total sum of refunds, paid from the EU budget in this period (8 position from the EU-27) [2].

## Final remarks

The submitted results of analyses indicate univocally that Polish food producers are competitive on the international market and the measures of the discussed competitiveness after the entrance to the European Union have improved and the perspectives are good. The competitiveness of food sector is higher on the level of processing as compared to the level of agriculture. We obtain also the comparative advances in the direction of processing which are based on imported raw materials.

The most competitive sectors of Polish food economy include meat sector, and fruit-vegetable, confectionery sector, secondary processing of cereals and manufacture of tobacco products. We do not possess the univocal evaluation of the dairy industry which has reached a high dynamics of turnovers and a high positive balance of exchange but, simultaneously, it is threatened by a loss of comparative advantages. The sectors with a low competitiveness include production of cereals and cereal products, oils, feed sector and alcoholic drinks.

The so-far existing source of comparative advantages in food sector included first of all lower prices and production costs (labour, land, energy, etc.) the mentioned advantages were revealed on the open European market at the moment of abolishment of barriers to the entrance of our agri-food products to the EU market. A significant role in revealing of the discussed advantaged was played by the adaptive processes of food sector to functioning in the market system and good adaptation of our producers to act of the Common European Market.

The phenomena which have been observed since a half of 2008 (*inter alia*, weaker results of foreign trade of agri-food products) indicate that Polish food economy as affected by global phenomena has lost its high developmental dynamics but still defends quite effectively against recession and economic crisis. The discussed sector has still remained competitive. The situation is very unstable and unpredictable but the type of the satisfied needs causes that a risk of crisis in agri-food sector is smaller than in other sectors of Polish economy. It is also important that in spite of a deep recession in the countries which are the main receivers of Polish food, a weak national currency allows implementing the relatively high Polish export of food and inhibits the increasing tendencies of food import. In consequence, it allows Polish producers to maintain their competition advantages and preserve a high position of our agri-food products on the world market.

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Economics of agriculture
SI – 2
UDK: 663.2:339.13

# TRENDS IN THE MARKET OF WINE

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## Abstract

*The market of wine depends on many factors (supply, demand, production conditions, environmental conditions, technical equipment, etc.). The fall in prices of wine was to stimulate consumption. The last process is a market adjustment and it rather that fall of wine prices are automatically accompanied with the consumption grow. Given that the European Union is the most important wine market in the world, the paper described the EU wine market, consumption, market segmentation, production, trends, imports, exports, with emphasis on the opportunities and threats for exporters and producers in developing countries.*
***Key words:*** *markets, wine, trends, EU*

## Introduction

Wine production in the EU has been variable in recent years and there is a decline in production. "The ten leading producers of wine in 2008. year were: Italy (18.1%), France (15.4%), Spain (12.9%), United States (7.1%), Argentina (5.5%), Australia (4.6%), China (4.5%), South Africa (3.8%), Germany (3.7%), Chile (3.2%)." (*Castellucci*, 2009) Production in 2008. year was about 162 million hectoliters, which is less compared with 164 hectoliters in 2007. year. Production in 2008. year, and in 2007. and 2002. year, the lowest recorded production of wine in the last 15 years. The leading wine producers are Italy, France and Spain (together with the participation of 75-80% of the total EU production). EU wine production has traditionally been located near the small vineyards (limited production for the industry). Vineyards in Australia,

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Argentina, Canada, New Zealand and the U.S. (have to offer wines at lower prices) were about 20 times higher compared to vineyards in Europe. "For example, producers from the North and South America and Australia is not a bad situation. Participation of wines from these regions in total sales increased by 3% in any 1990th year, to 30% in 2008. the year." (*www.casopisvino.co.rs*) The total consumption of wine in the world amounted to 243 million hectoliters (2008). Europe is most important wine market in the world (about 70% of consumption of wine in the world). EU resident consumes about 30 liters of wine (2008), provided that the level of spending in different member states and varies significantly (from 1 to 50 liters per year per capita). Also, significantly differ and preferences of consumers in member countries. The leading consumer of wine in the EU is France, followed by Italy and Germany. While the consumption in countries that traditionally consume wine more stable or slightly declining, the new wine consumer countries (Northern countries, eg., United Kingdom) can be observed a significant increase in consumption. Consumption of wine is slightly decreased in 2008. and 2009. year, which was expected due to the economic crisis. "Countries in the EU produce approximately 60% of the total amount of wine in the world, but even though European manufacturers still have no solution for the global power consumption, especially in those countries where wine has always been more than life figure in any of the reports economists." (*www.casopisvino.co.rs*) The same source points, only in France, the most famous wine country of the world, consumption per capita has fallen to 43l per year. For example, the figure in 2007. amounted to 47 l and 1959th even 120 liters. These results are probably a result of changes in relation to lifestyle and stricter regulations governing the permitted amount of alcohol in the blood of the driver. "In Western Europe consumption of wine, it is 33.9 liters (the rate of decline in consumption of 0,4%), while in Eastern Europe and 13 litres of the same marked decrease in the consumption rate of 1.14%." (*Štrbac Maja*, 2007) Trends identified include: wine market is "overcome" economic crisis, growing sales of wine in supermarkets; positive influence of moderate red wine consumption on human health is influenced by the growth of wine consumption; demand for lighter wines; demand for fair trade and "organic" wines; growing importance of packaging bottles and wine stoppers.

## Market segmentation

Depending on the color and type of wine, identified the following segments: 1) Red wines: red wines contain from 8-15% alcohol. Red wines are most popular wines in the EU. Red wine is made from one or more varieties of grapes. There are differences between Member States in consumption of red wine, but it is the largest consumption of Pinot Noir, Cabernet Sauvignon and Merlot; 2) White wines: White wines contain from 8-15% alcohol, and other types of wines that are most consumed in the EU. Consumers generally prefer dry white wines. As with red wine, there are differences between Member States in consumption of white wine, but it is the largest consumption of Chardonnay, Sauvignon Blanc and Riesling; 3) Rosé wine: Rosé wines

also contain from 8-15% alcohol. In recent years, growing popularity of rosé wine, and is treated as an exclusive summer drink; 4) Sparkling Wine: Sparkling wines, white or rosé wines generally contain 8.5% alcohol or more. The most consumed: Chardonnay, Pinot Noir, Pinot Meunier and Muscat Blanco; 5) Champagne is the sparkling wine of origin "Champagne" region. Consumers often do not distinguish between sparkling wine and champagne. The market for wine in the EU according to the amount of cost (€/bottle of wine) can be divided into three segments/ categories: high, medium and low. High market segment or so, "Premium segment" is expensive and high-quality wines, priced higher than the 10 €/bottle. Mid-market segment includes the popular less expensive wines, with the higher price of 4 - 10 €/bottle. Low segment consists of wines that sell for less than 4 €/bottle.

## Trends in the market of wine

The main trends observed in the market of wine are as follows. The market for wine is "overcome" economic crisis. Global economic crisis did not significantly affect the consumption of wine in the EU. Consumers are in 2009. year consumed less expensive wine instead of "reduction" in consumption (especially at home). Wine producers who sell large quantities of hotels and restaurants (reduced consumption) are more difficult to be "affected" crisis. Rising sales of wine in supermarkets. Consumers are increasingly buying wine in supermarkets. Because of the large supply of wine of different manufacturers, can get relatively good quality wines at affordable prices. In general, consumers in the EU are showing more interest in wine "unusual/suspicious" of geographical origin, such as new wines from exotic countries. However, traders and consumers in the EU needs a lot of time in order to ensure the quality of wine produced and imported from developing countries (so-called "non-traditional countries"). For example, Chile and South Africa are now accepted as the country's wine producers. On the other hand, wines from Uruguay were not identified. It is expected that the wines from developing countries to be more recognized by consumers in the near future. Positive effects of moderate wine consumption on human health have influenced the growth in consumer spending have been notified and have become more aware of the positive effects of moderate consumption of red wine to preserve and improve health. Wine contains antioxidants such as phenols and flavinoidi. It is believed that levels of antioxidants affect health. Modern medicine considers the impact on the human organism specific and worthy of attention. These are just some of the beneficial influence of wine, which recommend consuming and scientists. Wine and other foods should be consumed sparingly. If the entries in excessive quantities, can harm the body of wine to a large extent. (*www.organicwinejournal.com*) It is expected that further growth in consumption of red wine. "Consume a small amount of wine with a meal can be a good protection against decay brain cells, suggests the study by Italian scientists. However, too much alcohol have opposite effect." (*Štrbac Maja*, 2007) Given the trend of a healthy lifestyle and maintain optimal body mass, increasing demand for wines that contain a lower percentage of alcohol. Forecasts the growth in popularity of wine

containing 11 to 11.5% alcohol and apply to all types of wine. Growth in demand for "fair trade" and "organic" wine in most EU member states is growing interest in "fair trade" wine. Selling "fair trade" wine record growth every year since about 30%. Consumers are also interested in "organic" wines. The main reason for this is all polluted environment in which to produce grapes and wine. Analogous to other branches of plant production in viticulture and enology are increasingly using chemical means, which threaten to contaminate not only the ecosystem but also human health. As reply this condition, but have formed various national and international ecological societies, which have accepted the task of all available measures to fight against further pollution eco environment, and for the production of healthy and biologically valuable food. (*Avramov et al*., 1991) In addition to reducing the number of spraying and application of organic fertilizers and modern machinery contribute to the production of grapes, which is biologically healthy. Wine made from this grape is also healthier, and besides that reaches twice the price on the international market. (*Đekić Snežana*, 1992) Some supermarkets in the EU have introduced their own standards in accordance with "fair trade". For example, the Dutch supermarket chain Albert Heijn has standard "Puur & Eerlijk" to "fair trade" and "organic" products. "In most developed countries in the world vineyard growing demand for products from grapes without pesticide residues and other harmful substances, which encourages the development of specific forms of production such as organic (environmental, biological). In Serbia, the organic production of grapes still in its infancy." (*Korać Nada et al*., 2009) The same authors suggest, Ministry of Agriculture, Forestry and Water Management issued the Law on organic production and organic products (Official Gazette of the Republic of Serbia no. 62/06) and accompanying regulations. Lacks practical experience. The success of organic production of grapes, among other things, depends on the proper selection of varieties and varieties appropriate agricultural technology. "Under the control of professional activities grape production is assumed rigid control of all production grapes, which must be in accordance with the adopted study for given wine." (*Štrbac Maja*, 2009) Growing importance of packaging/shutter recent years, using many new packages that have been introduced and accepted by the trade and consumers (eg, "bag-in-box", packaging exclusive of wine). Instead cork shutter, are increasingly using plastic threaded closures. In addition to bottles of 0.75 and 1 liter bottles are significantly represented 2-5 liters, and the aggregate package of 2x1-5x1 liter in an attractive package. "Ten leading importer of wine in 2008. year are Germany (16.4%), United Kingdom (9.9%), United States (9.9%), Russia (6.9%), France (6.8%), Netherlands (4.1% ), Canada (3.8%), Belgium (3.7%), Switzerland (2.2%) and Denmark (2.2%)." (*Castellucci*, 2009) In the period 2004-2008. the value of wine imports (EU) recorded an increase of 3.8% per year. In 2008. year value of imports amounted to 10.9 billion €. Northern Europe "depends" on imported wines, as climatic conditions limit production in this region. Proportion of countries in EU imports is as follows: France (36% of total imports), Italy (17%) and Spain (9.9%). Developing countries have a share of 10% of the total wine imports in the EU. The leading vendors/suppliers from developing countries were Chile (4.7%), South Africa (3.8%) and Argentina (1.2%). Protected

geographical origin of wine in the EU are of high quality ("premium"). Wines from developing countries are often not competitive in this category of wine. Red and rosé wines are mostly imported into the EU. White wines are in second place with the participation of 29% of the total imports of wine, sparkling wine, followed by 9%. In the period 2004-2008. the growing import of all types of wines from developing countries. The largest increase in the value of imports of red and rosé wines (28% in 2008), followed by white wine at 15%. Participation of developing countries in imports of sparkling wine is very small and amounts to 2% in 2008. year. In 2008. year, bottled wine participate with 84% of the total value of imports, while 16% involved with packaging of wine is greater than 2 liters. Compared to the 2002nd year, imports of bottled wine, marked a decrease of 1%. Larger packs of wine recorded a slight growth in imports and 20% in 2004. year to 21% in 2008. year. In the period 2004-2008. the EU wine exports registered an annual growth of 5.7%. The leading exporting countries were: Italy (1.5 billion € in 2008./growth of 8.4%), France (1.2 billion €/0.2%), Spain (0.8 billion €/6,5 %), Germany (0.3 billion €/17.6%) and Portugal (0.2 billion €/3.9%). These five countries together have a share of 89% of total EU exports of wine (2008) and 60% of world exports. "In addition to Italy, France and Spain, the world's leading exporters of wine in 2008. year are: Australia (7.8%), Chile (6.6%), United States (5.2%), Argentina (4.7%), South Africa (4.6%), Germany (4.0% ) and Portugal (3.2%)." (*Castellucci*, 2009) Trends in the wine market in the EU may be opportunities for some, a threat to other manufacturers and exporters of wine at the same time. The above trends, each manufacturer and exporter should be analyzed in accordance with its capabilities. At the same time is very important to select appropriate sales channels in the EU. For exporters in developing countries that are specialized shops and "medium" importers. Supermarkets are important wine market in the EU, but not for medium and small exporters from developing countries (do not have enough demand that supermarkets). Specialist shops and "medium" importers are the best choice for exporters from developing countries, because they know the local market and have a good "relationship" with the target segment in the EU market. They are more interested in selling exclusive wines and often assist in promotional activities which is of great importance for the producer/exporter of wine. Also, establish important business contacts at trade fairs. In order to have success on the EU market, the quality of wines from developing countries must match the tastes of consumers. EU consumers generally prefer mild and dry wines of good quality of all kinds. Of course, there are differences in consumer preferences between the EU member states. It is necessary to build an attractive and original image, but adapted to the EU market. Pay attention to the text and style of expression that is becoming increasingly important (describe wine that is unknown to the consumer) in order to attract the attention of consumers. It is recommended that more producers in one country sell their wines at the same time the EU market. This allows to easily and effectively promote the geographical origin of wine, ie., the country/state. The EU is the world's largest importer of wine.

## Conclusion

Europe is the most important wine market in the world. European consumption of wine is about 70% of total world consumption. Wine production in the EU has an interest of 60% of the total world production. Based on the foregoing, the following main opportunities and threats for wine exporters and producers from developing countries:

- In the period 2004-2008. year, there is a growth of imports from developing countries;
- Wine imports from developing countries recorded growth of 7.8%;
- Red and rosé wines are the largest group, which manufactures the fastest growing;
- Developing countries have the largest share in imports of these wines (28%);
- There is interest in the wines "origins unusual", except that consumers are still unsure of the quality of these wines and have a longer period of time to decide to buy them;
- Rising consumption of wine in the "new" countries to consumers of wine (northern countries);
- Most important sales channels for manufacturers and exporters of wines from countries in the development of specialized shops and the "middle" importers. For large exporters, supermarkets may also be appropriate sales channels;
- For a time of economic crisis, the total consumption of wine in the EU recorded a slight decrease.

The EU is the main import market wines in the world. On the EU market there is a chance for the placement of good wines from developing countries.

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Economics of agriculture
SI – 2
UDK: 636.5.084

# INFLUENCE OF THE USE OF FOOD WITH ADDITION OF MINERAL ADSORBENTS ON ECONOMIC RESULTS IN CHICKEN FATTENING

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## Summary

*The aim of the research is to identify whether the mineral adsorbents added to the food of fattening chicken have impact on the cost-effectiveness of the fattening. The research was conducted on 400 fattening chicken, Cobb 500 provenience, divided into 4 groups, depending on the level of added mineral adsorbent: control group K (100 chicken, no mineral adsorbent added, 0,0%); experimental group O-I (100 chicken, with 0,5% of mineral adsorbents), experimental group O-II (100 chicken, with 0,2% of Processed mineral adsorbents) and experimental group O-III (100 chicken, with 0,3% of processed mineral adsorbents). Diet experiment lasted for 42 days. Results of the research show that chicken from O-I group had the best production results, followed by O-III, O-II and K as the poorest group. Calculations conducted during the work, it has been established that the addition of mineral adsorbents into the fattening chicken diet had very good effects on production and economic results.*
***Key words**: fattening chicken, mineral adsorbents, economic results*

## Introduction

Chicken fattening, as a final phase in the production line of chicken meat within the modern intensive poultry production based on industrial principles, is the fastest and the most rational way of producing poultry meat. In a floor system and on a deep mat, mainly heavy type hybrids are fattened, that are characterized by intensive growth, good food utilisation, fast feather growth, excellent carcass conformation, wide and long chest muscles and short leg muscles. Diet consists of fodder mixtures with significant energy and protein values. In approximately 6 weeks, fattening hybrid

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reaches live body mass of 1,8 to 2,1kg, with food consumption 1,8 to 2kg per kilo of weight gain. Meat of slaughtered and processed fattened chicken falls into high quality diet food. Easily digestible, chicken meat is widely accepted as the main protein source in human diet. Chicken meat proteins have all necessary essential amino acids. Apart from that, due to the significant content of B group vitamins and numerous minerals, especially of iron, as well as to beneficial ratio between the saturated and unsaturated fatty acids, chicken meat is irreplaceable in the diet of children, patients in recovery, chronic patients and all those who tale care about their diet (Gančić, M., 2000).

The aim of these researches was to verify data about the influence of different levels of mineral adsorbents on production and economic results of fattening chicken.

It is assumed that different levels of mineral adsorbents added to the diet of fattening chicken have different and varying effects on: consumption and conversion of the food; body mass weight gain; final body mass; slaughter and meat quality characteristics; health condition of fattening chicken and economic effects.

## Material and the work method

Examining of the influence of different levels of mineral adsorbents in the fattening chicken diet on: weight gain, food conversion, food consumption and economic results was conducted by the nutrition experiment. One day old chicken of the COBB 500 provenience were used in order to test the production qualities of chicken and the effect of mineral adsorbents-zeolite on them. The experiment was conducted with 400 chicken altogether.

Within the experiment, chicken divided in groups were fed meals of the same ingredient and chemical composition. The only difference was the kind and the level of zeolite added to the food. Chicken were kept in a floor system. Standard procedure of chicken fattening was used, lasting 42 days.

The experiment lasted 42 days. In this trial, chicken were divided according to the group-control system, by the scheme of completely random classification into four groups (100 chicken in group): control (K), experimental I (O-I), experimental II (O-II), and experimental III (O-III). Chicken in the control group (K) and all three experimental groups (O-I, O-II and O-III) were fed mixture of the same composition. The difference was only in the level and the kind of zeolite added to the food: K- 0,0%; O-I= 0,5% classic mineral adsorbents, O-II= 0,2% processed mineral adsorbents; O-III= 0,3% processed mineral adsorbents. Mathematical-statistical data analysis (parameters of descriptive statistics, variance analysis and LSD-test) done in Microsoft STATISTICA,ver.5.0.,StatSoft Inc. (1995), on the threshold of significance 0,01 and 0,05.

## Research results and discussion

During the fattening, positive influence of the mineral adsorbents was identified. Also, it is apparent that in lower concentrations, less than 0,3% Processed mineral adsorbents has poorer effect compared to classic Mineral adsorbents (Table 1).

*Table 1. Average body mass of chicken (g) by oldage in days*

| Oldage | Group | | | |
|---|---|---|---|---|
| | K group | O-I | O-II | 0-III |
| 1 day | $39,59^{A,B,C}$ | $41,18^{A}$ | $40,83^{B}$ | $41,20^{C}$ |
| 15 days | $546,49^{D,E,F}$ | $576,39^{D,g}$ | $567,38^{E,g}$ | $572,90^{F}$ |
| 30 days | $1284,97^{H,I}$ | $1381,05^{H,J,K}$ | $1296,52^{J,I}$ | $1322,22^{I,K,I}$ |
| 42 days | $1950,93^{M,n,o}$ | $2084,44^{M,P,Q}$ | $1901,80^{n,P,R}$ | $2013,62^{o,Q,R}$ |

A, B,C, D, E, F, H, J, K, M, P, Q, R, $p<0,01$
g, l, n, o, $p<0,05$

At the measuring on 30th day, regardless of the mineral adsorbents source, its addition positively influenced body mass, since the average values were statistically significantly smaller in the first group compared to groups O-I and O-III.

In this period, better influence of classic mineral adsorbents form was observed, since the results in the group O-I were better compared to all other groups, in terms of statistical significance in differences of average masses.

When examining the effect of the dosage of processed mineral adsorbents, one can find that the average body mass is statistically significantly bigger with higher concentration of Processed mineral adsorbents.

At the end of the experiment, the best results were accomplished in the group eating food with addition of the classic mineral adsorbents, and those differences are statistically very significant. The effect of the added mineral adsorbents, regardless of its form, leads to the statistically significant increase in chickens' body mass at the end of the experiment, whereby in terms of differences due to the processed mineral adsorbents concentration in food there is statistically very significant difference, since the results are much better with the concentration in the amount 0,3% compared to concentration 0,2%.

Although the body mass is a good indicator, is considered that the daily weight gain is more reliable indicator of the food quality, and especially of the hygienic propriety and health of animals.

During the firs 15 days of the experiment, all treatments using mineral adsorbents gave positive effect, since statistically very significantly higher weight gain was achieved than in chicken not consuming any form of mineral adsorbents. In the period 15-30 days of the experiment, chicken that were consuming food with classic Mineral adsorbents added have shown the biggest weight gain, with statistically high significance, while the use of processed mineral adsorbents had no effects. The question remains, and leaves room for future research regarding the use of possibly higher doses of Processed mineral adsorbents (Table 2).

*Table 2. Average daily weight gain (g)*

| Oldage | Group | | | |
|---|---|---|---|---|
| | K group | O-I | O-II | O-III |
| Average 1-15 days ,gr | 33,79$^{A,B,C}$ | 35,67$^{A}$ | 35,16$^{B}$ | 35,45$^{C}$ |
| Average 15-30 days,gr | 49,24$^{D}$ | 53,59$^{D,E,F}$ | 48,61$^{E}$ | 49,95$^{F}$ |
| Average 30-42 days,gr | 55,50$^{g,H}$ | 58,71$^{g,I}$ | 50,37$^{H,I,J}$ | 57,62$^{J}$ |

A, B,C, D, E, F, H, I, J, p<0,01
g, p<0,05

The expenditure of food during the entire period of chicken fattening is shown in the next Table. Namely, chicken from the control group were consuming slightly larger quantities of food compared to experimental groups. It is known that the Negative effects on chicken food consumption (*Scheffer, 1993*) are manifested even in the smallest quantities of microtoxins (0,02mg/kg BM ili 0,15mg/kg food), which increase proportionally to the quantity of toxin present in the food or duration of the intake of the contaminated food. Negative effects disappear very quickly upon the exclusion of the contaminated food, thus in such a case positive effects of the mineral adsorbents can not be expressed.

*Table 3 Concentrate consumption /gr/broiler/*

| Mixtures | Group | | | |
|---|---|---|---|---|
| | K group | O-I | O-II | O-III |
| Mixture I | 1.095 | 918 | 1.043 | 1.006 |
| Mixture II | 1.596 | 1.379 | 1.442 | 1.417 |
| Mixture III | 1.439 | 1.209 | 1.196 | 1.308 |
| **Total** | **4.131** | **3.507** | **3.681** | **3.730** |

Calculation of the expenses for the mixtures used iz derived according to the composition of each of the mixtures and is given in Table 4.

*Table 4. Expenses of materials for the preparation of particular mixtures (€/kg)*

| Mixtures | Group | | | |
|---|---|---|---|---|
| | K group | O-I | O-II | O-III |
| Mixture I | 0,3056 | 0,3080 | 0,3074 | 0,3083 |
| Mixture II | 0,2471 | 0,2495 | 0,2489 | 0,2498 |
| Mixture III | 0,2062 | 0,2086 | 0,2081 | 0,2090 |

According to the realised expenditures of each mixture and material expenses for each individual mixture, the calculation of food expenses has been derived (Table 5).

*Tablea 5. Food expenses (€/broiler)*

| Mixtures | Group | | | |
|---|---|---|---|---|
| | K group | O-I | O-II | O-III |
| Mixture I | 0,33 | 0,28 | 0,32 | 0,31 |
| Mixture II | 0,39 | 0,34 | 0,36 | 0,35 |
| Mixture III | 0,30 | 0,25 | 0,25 | 0,27 |
| **Total** | **1,03** | **0,88** | **0,93** | **0,94** |

Apart from the food expenses, that present the largest part of the expenses in fattening broilers production, other expenses are of great importance too. Calculation of other expenses is derived in accordance with previous researches and given in table 6.

*Table 6. Other expenses of broiler breeding (€)*

| Expense category | Amount |
|---|---|
| Expenses of the building and equipment | 0,32 |
| Mat | 0,04 |
| Vaccination | 0,02 |
| Vitamins | 0,01 |
| Revaccination | 0,02 |
| El. Power | 0,06 |
| Gas | 0,10 |
| Salaries | 0,21 |
| **Total** | **0,78** |

In addition to the expenses that were made, financial results were also influenced by the moratlity during the fattening, regardless of the fact that broilers were not manifesting clinilac symptoms that would point to the specific influence of microtoxines during the experiment. Highest mortality was seen in the control group (/), while the experimental groups had significantly lower mortality rate (O-I and O-II 3 broilers, O-III 2 broilers). Acccording to the achieved production results and market prices of fattening chicken, calculation was derived for total expenses, overall income and calculated cost prices (Table 7).

*Table 7. Total expenses of broiler breeding (€) and cost price (€/kg)*

| Mixtures | Group | | | |
|---|---|---|---|---|
| | K group | O-I | O-II | O-III |
| One day old chicken | 0,35 | 0,35 | 0,35 | 0,35 |
| Nutrition expenses | 1,03 | 0,88 | 0,93 | 0,94 |
| Other expenses | 0,78 | 0,78 | 0,78 | 0,78 |
| Total expenses | **2,16** | **2,01** | **2,06** | **2,07** |
| Incomes /minus mortality/ | **1,90** | **2,48** | **2,16** | **2,28** |
| Gain | -0,26 | 0,47 | 0,10 | 0,21 |
| Cost price €/kg | **1,19** | **0,99** | **1,12** | **1,05** |

Displayed results show significant differences in achieved economic effects between certain groups. Control group achieves negative financial result, whereby the total cost price surpasses the market value. Experimental groups, on the other side, materialise positive financial effect, wherein the observed differences are most pronounced in the case of O-I group, where 0,5% mineral adsorbents were added in the food.

## Conclusion

At the end of the experiment, it is possible to deduce that the use of mineral adsorbents in concentrate mixtures can be very advantageous solution. Thus, the use of mineral adsorbents has been proven as reasonable. Obtained results are in compliance with bibliographic data of Prior et al. (1979) and Ayed et al. (1991) who ascertained significantly lower daily weight grow in broilers fed mixtures without adsorbents.

Since the calculation of economic effects is derived on a relatively small sample, such data indicate further research is needed in regard of examining concentrations and results that can be achieved with the use of mineral adsorbents in the nutrition of fattening chicken and kinds and other categories of live stock.

Although according to the presented results use of mineral adsorbents in chicken fattening gives better production and economic results, full effects of mineral adsorbents can be expected only with the differentiation of the chicken meat market and building up of customers' willingness to pay for products according to their quality.

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Economics of agriculture
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UDK: 658.788.4

# PACKAGING AND VIABILITY OF FOOD PRODUCT

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## Abstract

*Packaging is the holder and makes it all that into what the product is put. During its preparation in use are different materials: glass, paper, wood, plastic, metal, ceramic. In packaging design involved experts from different fields-technologists, economists, marketing experts, designers, psychologists etc. Functional suitable packaging is becoming an effective mediator between producers and customer. functions of packaging are different, the most important are following: protection and sustainability of food products, transportation products, easier usability of products, economy, identification and information, motivation, shopping, helping form a good image of the product and recycling after use and conservation of natural habitat. Image product is the overall impression that the product creates a potential customer and includes values, attitudes, and stereotypes about him. Image is not static assumption, but is a process that moves from initial phase of the image-formation and its relative stability. However large number of producers, competitors, particularly large number of similar products developed markets requires a good familiarity with distinction, which is achieved by image producers, or its products.*
*Aim of this work of implementing packaging materials and choice, producers of food products around appropriate packaging and requirements in order to successfully meet demands of sustainability of packed food quality products that they face a modern consumer society.*
***Key words:*** *packaging, viability of food product*

## Introduction

World market has great interest in new kinds of food products that rely on various types and forms of packaging, combinations packaging materials and processes

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packaging. Food products are highly sensitive to biochemical changes that may occur in technological process (effect of temperature and oxygen content on oxidation changes) as well as during storage of packed product. Develop way of packaging materials and packaging, and packing process are very long. Goal was always same, that for a long time maintain quality of food product.

The development of packaging materials and packaging systems depends on: increase in number, population, economic strength of customers, changes in living conditions and habits of people and technological development of packaging machines.

Until industrial revolution in nineteenth century most of products for human consumption is consumed in production area. Rarely happened that product prepared from worn inner regions of basic raw materials.Customer - consumer brought himself packaging in which buying and wearing products purchased. This type of packaging is marked as *issued packaging* and was a first-generation packaging.

In second half of nineteenth century, population is economically strengthened, trade expanded and developed. Progress in transportation, industrialization, production of larger series, it has developed by use of returnable packaging. Returnable packaging is second generation. Second-generation packaging accompanied cheap labor that covered costs of collection, selection, washing and re-control and other activities necessary prior to its reuse. After World War II, under pressure from food industry, trade is a strong industrialization of the food distribution and other products for human use. During this period create a phenomenon of supermarket. In supermarkets packaging becomes intermediary between producer and buyer. Their shape, appearance, way of opening messages and education materials she assumes role of professional seller in supermarkets. Because of difficulties in organizing preparation, storage and shipment of returnable packaging, supermarkets are pressured to get rid of return. Self-service requirements are clear and asked for use of non-returnable packaging.

- This *irreversible packaging* belongs to third generation. Irreversible packaging become a valuable raw material if it is very well organized, thought out price policy and fostering the habit of collecting, sorting and direct processing. Development of *plastic packaging* has brought a major shift in the packaging industry.
- A new generation of packaging materials emerged in twentieth century, when the man rose to level that can produce such materials do not exist in nature.
- Plastic is youngest bulk packaging material that man began to use industrial. Basis for plastics is petroleum. If we look at structure of consumption of oil as a natural material, of total world consumption of oil, 5% is spent on chemical and petrochemical industries. Today, getting new and improved types of existing packaging materials with better utility value and improved performance.
- Using optimal benefits of aluminum foil, paper, cardboard and plastics, today is developing a new type of packaging so. *Combined package* that starts successfully compete with standard packaging of mono-material.
- A good part of packaging materials, if not collected, pollute environment, giving it the fourth generation of packaging known as *self-destroys, biodegradable*

*packaging*, which is composed of ingredients that enable a faster degradation of packaging materials and thus is environmentally justified.

- Recently developed food packaging in *edible packaging*, which consists of materials based on saccharin, protein and pectin.
- This type of packaging belongs to fifth generation of packaging.

Latest developments on market in the packing process and sustainability of food products are *active and intelligent packaging* that belongs to sixth, next-generation packaging.

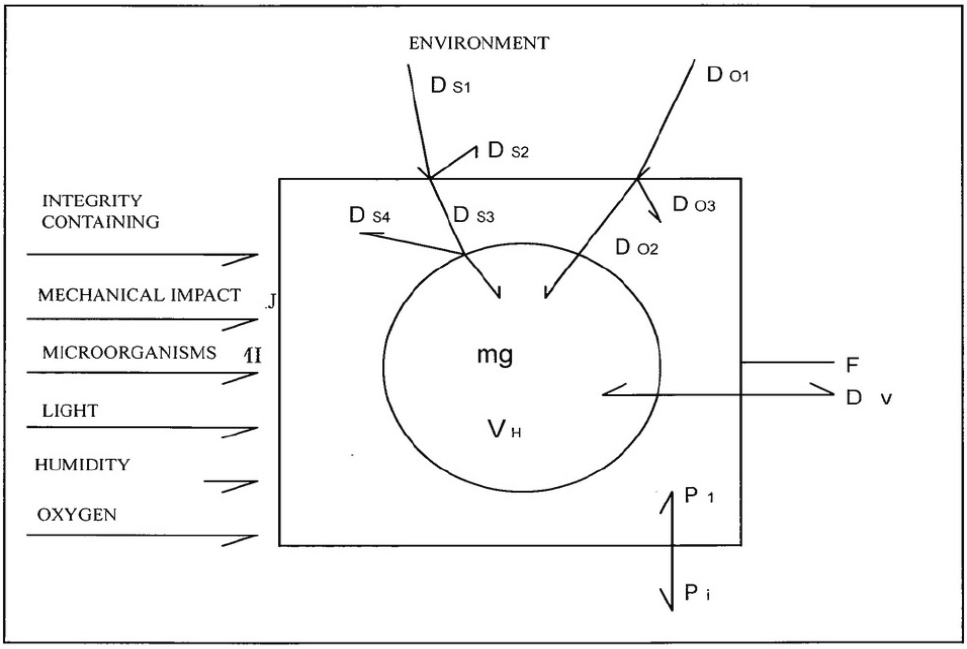
- **Active packaging,** means that components of packaging materials interact with atmosphere above the packed product, quality and extending shelf life of products.
- **Intelligent packaging**, communicating with customers, monitor and signal condition of packaged food in order to obtain information about the quality of food during transport and storage (signaled a change in temperature, pH, color, etc.).

## Sustainability of food products

Food products by their chemical composition is very sensitive to biochemical changes that may occur in the technological process (effect of temperature and oxygen content on the oxidation changes), as well as during storage of packed products. During storage of packed content, according to the applied packaging may be a change in water content, values and biochemical changes caused photo-oxidative influence. In addition to protecting integrity of content, packaging must protect packaged product from mechanical impact, impact of micro-organisms, light, molecules of oxygen and moisture.
Packaged products are subject to influence of light, molecules of oxygen and water vapor, intensity and speed of diffusion barrier properties depend on types and combinations.

*Metal packaging* for a stable crystal structure of materials and packaging pressurization system is a good protection to packed product. This types of packaging in addition to protecting integrity of content, protects the packaged product from mechanical impact, the impact of micro-organisms, light is impermeable to molecules of oxygen and moisture. Proper conduct of technological production process you can get a quality product. Due to characteristics of materials, metal containers must be well protected on inside of product, so to prevent interaction between products and materials from which packaging is made. In *glass packaging*, glass as a material has a crystalline structure with a wider range of amorphous structure so that characteristics of this type of packaging transparency or transmittance of light. Products packed in glass packaging are protected from mechanical impact, influence of microorganisms, and permeability of molecules of oxygen and moisture. Light transmittance is reduced staining glass batch (green, brown). If properly carried out sealing lid-jar, the packaging protects the packaged product from reinfection by microorganisms.(1)
All *polymer packaging materials* in more or less light transmission, molecules of gases and water vapor, so that these characteristics influence their use for packaging of certain food products.

*Picture 1 - Barrier properties of polymer packaging*




- *F - total active surface of packaging unit*
- *DV - diffusion of water vapor molecules*
- *mg - critical limit of tolerance products at O2*
- *DO1 - 3 - diffusion of oxygen molecules*
- *VH - volume of voids product*
- *P1 - partial pressure in packaging unit*
- *DS 1 - 4 - diffusion of light*
- *Pi - partial pressure of environment*

Diffusion of *water vapor molecules* is simpler and depends directly upon water content in product. According to presented model, *oxygen* that diffuses through packaging speed v1 accumulates in space above contents of containers (v3) and spent on adsorption in content (v2). In this diffusion depends on total area of packaging material through which oxygen diffuses (F1), partial pressure of oxygen within packaging (p1), cavity volume content (VH) and critical limits of packaged products tolerance for oxygen (mg).(2,3) To reduce concentration of oxygen molecules, packing is done before de-aeration products or closure under vacuum (drawing air from the packaging). In order to prevent subsequent access to oxygen from surrounding environment in a packaging unit or loss of protective gas from packaging unit, choose packaging materials and containers tightly to oxygen and other gases. Reducing partial pressure of oxygen within the packaging is achieved by using protective modified atmosphere, i.e., packaging products under nitrogen, carbon dioxide or an appropriate mixture of these gases. In case of packages under pressure of nitrogen, oxygen diffusion from external environment occurs only when equalized partial pressure on outer and inner

packaging. Decline of internal pressure loaded gas occurs due to permeability of packaging materials. Formation quality packaging unit means that all connections to primary container tightly closed. At the same time must not remain open or pores that allow free exchange of undefined atmosphere over content of the external environment on molecules of gases or poor hermetic packaging units.

## Influence of humidity on changes on packaged products quality

Shelf life of packaged products depends on its hydrate condition.
Measure of hygroscopic products, or its capacity of receiving water, depends on affinity of water hygroscopic ingredients in packaged products. Changes in texture, color, taste and smell, packaged food products depend on aw values and the active surface area product and critical levels of tolerance change quality of products based on sorption isotherms.(5,6)
Increased moisture content and aw value changes during storage depend on permeability barrier properties of water molecules packaging materials used.

## Importance of proper formation and packaging closure

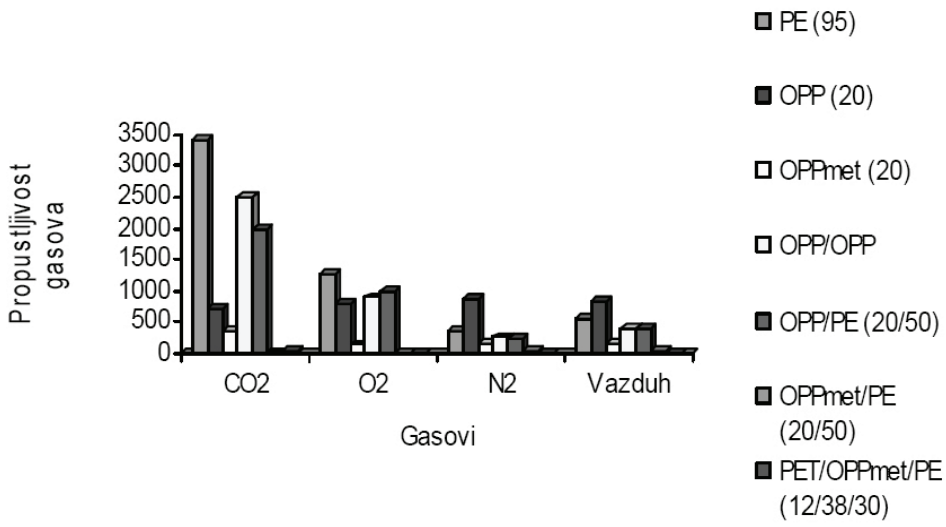
One of factors that affect quality of packed product and its sustainability is properly used and well established packaging. Due to poor pressurization system, within packaging can came to increased diffusion of oxygen molecules, caused by difference in partial pressure on outer and inner packaging.

## Barrier properties of polymeric packaging materials

Packaging polymer molecule gases miss depending on type of material and difference of partial pressure. And packaging unit is poorly formed will be increased in diffusion of molecules of gases and water vapor. To achieve optimal characteristics of safety is used combined packaging. For extremely sensitive products combined use aluminum foil as a metal that is sealed to electromagnetic radiation, molecules of gases and water vapor. Thickness of aluminum layer is 7 μm or greater. It is thus obtained by combined packaging materials impermeable to light and virtually impermeable to gas molecules and water vapor. In order to improve barrier properties of polymer films can apply a thin layer of aluminum (and other metals) metallization process.(3,4)

This improves barrier properties of films in metalize electromagnetic radiation (90%), and molecules of gases and water vapor. Degree of barrier properties improvement caused by mass (thickness) of deposited metal and distribution on surface of polymer film.

*Figure 1. Gas permeability with various combinations of packaging materials*




## Conclusion

To maintain and extend optimum processing quality of food product, it is necessary to provide exactly defined quality packaging, which will allow you to maintain quality of packaged product as long as possible and extend to moment of use by using appropriate protective atmosphere.

- Packaging and sealing its barrier properties must be defined to provide adequate protection for nutritional value and high quality media yet shelf.
- In order to achieve these requirements, type and sensitivity of product should be applied to optimal type and combination of packaging materials and sustainable use of extended application of the appropriate protective modified atmosphere, especially due to big number of similar products and because of big number of competitors in producing, because developed markets demand recognition of their goods.

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Economics of agriculture
SI – 2
UDK: 631.147:339

# GLOBAL ORGANIC PRODUCTS MARKET

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## Summary

*The increased demand for food in the world has caused the development of intensive agriculture that is based on the use of considerable amount of chemical substances. The high level of use of fertilizers and plant protection substances damages the environment and has a bad impact on the food quality, whose repercussions can often be felt on environment and human health. In contrast to conventional agricultural production, healthy safe food is produced within the system of organic farming and processing. This type of food is completely grown and produced without synthetic substances (mineral fertilizers, pesticides, plant growth stimulators, hormones, etc) and genetically modified organism (GMO). The production of healthy food currently has an upward trend worldwide, and it is the result of constant demand for such products. There are attempts to initiate the use of healthy food in nutrition and thus contribute significantly to human health and environment protection. There is, however, a question arising of whether global economic crisis is likely to reduce demand for organic products.*
***Key words****: organic agriculture, global market*

## Introduction

Organic (alternative, ecological, biological) agriculture involves making the development harmonized with the needs of market and environment protection. According to the definition offered by FAO (The Food and Agriculture Organization of the United Nations) and WHO (The World Health Organization), organic agriculture is a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity and biological cycles. It emphasizes the use of management

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practices in preference to the use of off-farm inputs. The term organic (ecological) agriculture was first employed by Lord Northbourne in 1940 in his book 'Look to the Land' where he describes a holistic and ecologically balanced approach to agriculture.

The key aim of organic agriculture is the production of food having high nutritive value, sustainable development of agriculture along with ecosystem protection, and soil amelioration. Organic agriculture includes the maximum use of renewable energy sources, maintaining genetic variety of agro-ecosystem and environment protection, reducing environmental degradation that can result from agricultural production in order to get better conditions for meeting basic needs of farmers and generate secure financial income.

The aim of this paper is to overview the basic characteristics of global market for organic products. Therefore, an image of transparency is obtained with the aim of getting our country involved in international market.

## Global organic food market

### *Global organic food markets worldwide*

Organic agriculture is intensively developing in the world – throughout 145 countries of different sizes and with different intensity (2009). 35 million hectares of land is cultivated organically; also, it is estimated that non-certified production is carried out on additional 20 million hectares of land, which totals more than 50 million hectares of organically cultivated land in the world [1]. Most of this land is non-cultivated certified land comprising pastures and forests where livestock feeds on grass, beekeeping is practiced and herbs are collected. The process of certification of this land is simplified and does not require excessive funding, and the meat of such livestock is mainly exported [2].Globally, organic agricultural land in all regions increased by 3 million hectares in 2008 in comparison with the year of 2007 (by 9%) [3].

Regionally, the largest areas of organic land are located throughout Oceania (35%). Europe holds second place with 23% of organic agricultural land. The smallest areas are in North America and Africa, with 7% and 3% respectively as of 2008. According to countries worldwide, Australia has the largest area of organic land (12 million hectares), followed by Argentina (4 million), China, the USA and Brazil with 2 million hectares each (2008). Despite the fact that this type of production is rising considerably, it takes up a small portion of global agricultural production. The largest share of organic agricultural land in total land may be found in the Falkland Islands (36.9%), Lichtenstein (29.8%) and Austria (15.9%). Above ten percent of organic agricultural land there is in Switzerland, Sweden and Guyana. It is generally accepted that a country is organically developed if there are more than two percent of its territory under organic agricultural production [4].

There are more 650 thousand farms in the system of organic production all over the world. Most farms are located in South America (30%), followed by Europe (27%) and Asia (21%). In 2008 there were 1.38 million registered farmers throughout

the world dealing with various types of organic agricultural production. Most organic producers are located in Africa (34%) and in Asia (29%) of the total number of producers of organic food in the world. The countries with the largest number of these producers are India (340,000), Uganda (180,000) and Mexico (130,000) [4].

The turnover of organic food and drinks in the world accounted for 16 billion US dollars in 2000. Global organic food market rose to 26.5 billion US dollars in 2004, whereas in 2008 it reached 50.9 billion US dollars. The value of this market increased by over 34 billion US dollars for eight years [1]. The rise of global organic food market accounted for 43% in the period between 2002 and 2006. The demand for organic food is going up, especially in the USA and Europe, where sales increase by five or six billion US dollars every year; likewise, as expected, developing countries may benefit from this type of production. North America and Europe comprise 97% of the total sales of organic food in the world.

Organic products account for only one percent of the total global food market. The demand for these products in recent years has been increasing. The developed countries of Western Europe, the USA, Canada, Japan and Australia have fully built awareness of organic food resulting in increased demand for organic products.

The United States of America is a country with the highest demand and consumption of organic food. The sales have soared. In 1990 they totalled about a billion dollars in contrast to 24.8 billion dollars in 2009. Compared with the year of 2008, the sales rose by 5.1% in 2009 [1]. Organic food and drinks sales account for 3.7% of the total sales in the USA in 2009. The Government plans to encourage its increase in future years. The most significant demand is the one for fruit and vegetables (39%), followed by the demand for drinks, milk and dairy products (2008). The least demand is for meat, spices, bread and cereals [6].

Organic food is available in over 30 thousand specialized retail outlets and in almost 80% of outlets where conventional goods can be bought. Large retail chains, such as *Wallmart, Price Chopper and 7-Eleven*, have permanent and varied offer of organic products, and top food industry companies, such as *Campbell's*, *Archer Daniels Midland* and *General Mills*, increased their production of organic food beside their conventional products. Multinationals, such as *McDonald's*, have recognised and accepted this customers' trend, so considerable amounts of conventional coffee and milk have been replaced by their organically produced counterparts.

## *Organic food market in Europe*

Since early 1990s, organic production had been developing rapidly in most European countries, but due to the effects of global economic crisis in 2009 its development was hindered. In European Union there are more than 7 million hectares of certified land for organic production, which comprises about 3.6% of the total agriculture land (2008). There was 1.5 million hectares in the system of organic production. Therefore, organic agricultural land has risen by almost five million hectares for about ten years. In the same period the number of organic farms increased from 50 thousand to

almost 200 thousand [7]. The leading countries in Europe according to organic land in 2008 are Spain (1.3 million hectares), Italy (1 million hectares), Germany (0.9 million hectares) and Great Britain (0.7 million hectares). As of 2008, the organic land in these countries is mainly used as meadows and pastures (44%), as plains for growing crops (37%) and for perennial plants, i.e. fruit and vine (10%) [8].

Austria has the largest share of organic land in the total land (15.9%). There are 10% of farms registered for organic production in this country; the other countries with the largest share of organic land are Italy, the Czech Republic and Greece. There are about six percent of fertile soil in the system of organic production in most European countries. It is seen that in the countries of Central and Eastern Europe there is a significant increase in organic production. The European Union is planning to make the production of organic food reach 10% by 2013. Organic food market in Europe reached 17.9 billion EUR in 2008. The largest markets are Germany (5.8 billion EUR), France (2.6 billion EUR), Great Britain (2.5 billion EUR) and Italy (1.9 billion EUR) [9]. In recent years organic food market in Europe has faced a considerable rise between 5% and 30%, depending on the country. When speaking about the demand in the European Union in 2007 for various products which are organically produced, one third refers to fruit and vegetables, followed by baked goods (bread and pastries) with 30%, and milk and dairy products with 27% [4]. In the total sales, the biggest share of organic products is in Denmark where it accounts for 8% (2009), followed by Austria (5.3%) and Switzerland (4.3%) [4]. The largest sales of organic food per capita in 2008 are also in Denmark (132 EUR per capita), followed by Switzerland (119 EUR per capita) and Austria (97 EUR per capita) [3].

The biggest exporter of organic food in 2008 is Italy (900 million EUR), followed by Spain (315 million EUR) and Denmark (88 million EUR) [3]. The country that has progressed significantly is Denmark, where almost a quarter of the total agricultural production is under BIO certificate. In the structure of the total demand, organic products account for 8.1% (2009). The most important products that are organically produced are milk and dairy products (38%), fruit and vegetables (20%), wheat, bread and flour (15%) and meat (9%). Almost all the supermarkets have their own organic or bio brands [11].

According to the results of research [12] on an analysis of condition and predictions for trends on the organic food market, it is seen that the market of Denmark, Austria and Switzerland is saturated and in future period they will have an increase by 5% yearly. The market of Germany and Great Britain is rising (between 5% and 15% a year). At the same time the market of Hungary, the Czech Republic and Spain will have the same increase because they are currently at a low level. It is predicted that the lowest increase rate is in Denmark (approximately 1.5%), and the highest is in Great Britain (approximately 11%). Besides, it is expected that cereals will be a type of products with the lowest increase, whereas meat and meat products will rise most. Also, the demand for fruit and vegetables might be larger than the supply of these products in future years [13].

In Germany, global economic crisis influenced consumers to buy less organic products. In 2009 there was a decrease in the demand for organic products. In 2009 consumers spent four percent less of funds on organic products (food and drinks) than in the previous year [14]. About 85% households in Germany in 2009 bought at least one

organic product. Despite the fact that the prices of these products dropped by about two percent in comparison with the prices in 2008, the spending on them slightly decreased. The most dramatic fall in spending is seen in low-budget stores although they reduced the prices (about 7%), whereas specialized stores kept the previous level of sales, and prices remained at the level of the year 2008. The consumption of organic products is strongly influenced by income of the household. The reduction in consumption is not seen only in the group of consumers (28%) who think that the available home budget and the period of crisis enable them to spend money without rationalization. The other consumers, who have limited home budget, take into consideration whether organic products are worth paying so much (even 75%) in comparison with conventional products [15].

Financial crisis also influenced a reduction in demand for organic food in Great Britain. The rise in sales of organic products in 2008 accounted for 1.7%, whereas it rose by 26% on average in the last decade. However, there was a significant fall in 2009. That year, the sales of organic food and drinks dropped by 12.9%, and it was the first fall since 1993. The research showed that not only consumers spend less on organic products, but sellers reduced their offer significantly. There are three categories of organic food that have a significant fall in sales: the sales of dairy products fell by 5.5%; fruit and vegetables by 14.8%; meat by 22.7%. The consumption of bread and baked goods showed the most dramatic fall – by 39.3%. Simultaneously, the demand for organic milk has gone up. The analysts believe that it is inevitable in every area struck by financial crisis; furthermore, organic food costs far more than conventional products [16].

The main obstacles to the development of organic food market in the European Union are as follows: fragmented and weak market; lack of marketing knowledge; weak cooperation and communication; and low output prices formed by farms. The key problems of the demand are: high retail prices; limited availability of ecological products; consumers are insufficiently informed; competition of non-ecological substitutes; the lack of credibility of certification institutions, etc [13]. The European Commission launched a campaign for promoting ecological production of food under the slogan: '**Organic farming. Good for nature, good for you**.' Its aim is to get consumers informed about the significance and benefits of organic farming and organic food production. This campaign will focus on raising consumers' awareness, especially on young people who are supposed to transfer the idea of organic food in future [17]. A fast process of getting the biggest world's food industry companies involved in organic production is the most convincing evidence that this category of products does not mean fashion or a consumers' fad but their permanent attitude.

## Conclusion

Organic agriculture primarily emphasizes food quality and safety in contrast to conventional food that aims, above all, to increase the production. Organic agriculture is closely connected to the concept of multifunctional agriculture.

Organic farming land has had a considerable rise all over the world. There are 35 million hectares of land cultivated organically; in addition, it is estimated that non-

certified production is carried out on about 20 million hectares of land. More than 650 thousand farms are involved in this type of food production. In 2008 global organic food market reached 50.9 billion US dollars. For eight years the value of this market rose by over 34 billion US dollars. The highest demand for organic food is in the USA, Germany, France, Great Britain and Italy.

Financial crisis, however, influenced a reduction in demand for organic food on various markets. The main factor for limiting further expansion is considerably higher price of organic food compared by conventional food.

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Economics of agriculture
SI – 2
UDK: 330.322 (498)

# REGIONAL DISPARITIES IN ROMANIA – AN ANALYSIS ON THE FOREIGN DIRECT INVESTMENTS EFFICIENCY

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## Abstract

*By this study, we intend to analyze the evolution of the Romanian regions during transition under the influence of the foreign direct investment (FDI) inflows, using the efficiency calculations of the macroeconomic indicators. The methodology developed by Romanu & Vasilescu (1993) was chosen because it reflects, in a direct way, the contribution of the investments on the evolution of the macroeconomic indicators and in which way the FDI influenced their evolution. The ratio between the variation of the indicators of effort and effects shows us the efficiency and the progress of an effect indicator for every additional value of effort. We consider as effort indicator the FDI level and effect indicators the gross domestic product (GDP), gross value added (GVA) and fixed gross capital formation (FGCF).*

*If we have in view these premises, the evolution of the Romanian economic development regions is characterized by huge disparities. The most obvious is between Bucharest and the rest of the regions. In the same time, FDI had strong positive influences on the macroeconomic indicators and the activity was efficient only after 2000.*

**Keywords**: Investments, Efficiency, Regions, Romania.

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## Overview

The study uses data provided by the national institutions specialized in foreign direct investments (FDI) monitoring in Romania like the National Office of The Trade Register (NOTR), National Institute for Statistics (NIS), Romanian Agency for Foreign Investment (RAFI) and the National Bank of Romania (NBR). According to NOTR definition, the foreign capital invested in Romania is equal to capital subscription to matriculations, plus subscriptions through capital increase mentions, minus share capital transferred by non – resident shareholders /associations to resident shareholders/associations, minus share capital subscribed to firms erased from the trade register.

The methodology used in this study is based on the papers elaborated by Romanu & Vasilescu in 90s. They are an extended research of the papers published by Camasoiu in 70s, with direct applicability in Romanian economy, at macroeconomic level. The papers had in view an analysis of the efficiency of the investment flows using the evolution of the main macroeconomic indicators under their influence. We chose as indicators which reflect in the best way the evolution of the Romanian economy the following: gross domestic product (GDP), gross value added (GVA) and fixed gross capital formation (FGCF). GDP is defined as the sum of value added at every stage of production of all final goods and services produced within a country in a given period of time. GVA is defined as GDP minus taxes and subsidies on products. FGCF is defined as the total value of additions to fixed assets by resident producer enterprises, less disposals of fixed assets during the quarter or year, plus additions to the value of non-produced assets.

Because the capital plays a very important role, conducts our life in a totally different way than twenty years ago, at the beginning of the transition period and will have a deeper influence, in the next decades, we consider that FDI is an important indicator of the state of the economy. The investment activity has a central position in economy because it is an instrument for achieving economic growth. Among different forms of investments, foreign capital and FDI seem to be the most dynamic and advantageous for the countries from Central, Southern and Eastern Europe, for the sides implies in this process, investors and receivers.

In the last fifteen years, in Romania have developed different concepts concerning investment policy, regional development and the role of FDI in the future economic stability, in pre-accession period and after the accession into European Union structures. Unfortunately, the policies suffered of the lack of poise and the decision-makers showed a totally lack of consistency with grave negative effects on the next decision steps.

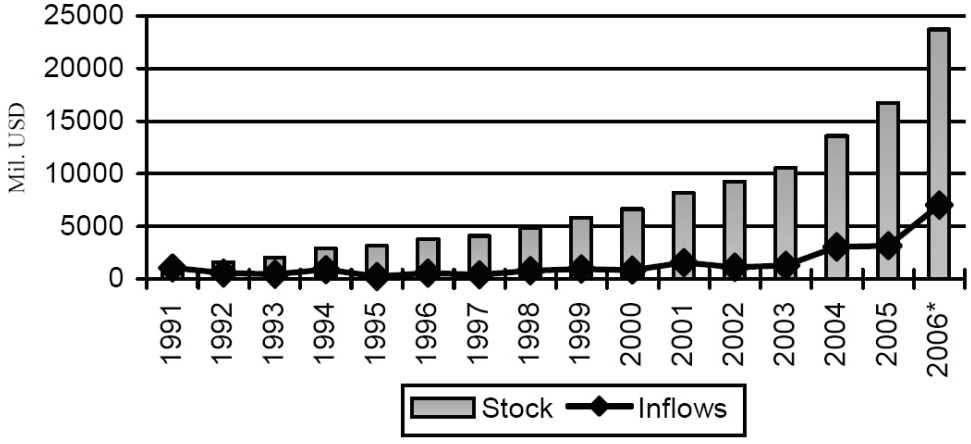
## The evolution of the foreign direct investments

In many years during transition, Romania did not have a good image on the international market and in the eyes of the investors. It played an unsignificant role in the region and the capacity of absorption of the FDI was weak (about 6% from regional FDI inflows till 2005). For the foreign investors, the general climate of the economy was not the best in attracting strategic investments and that was the main barrier against economic development.

After the last EU enlargement in 2004, the major foreign investors in Central and Eastern European Countries (CEEC) have changed their policy and started to invest in South Eastern European Countries (SEEC) more than before. In 2005, according to RAFI data, about 12 Billion $ were invested in SEEC (it is an absolute record for this region). Among the countries in the region, Romania was the main destination with more than 51% from total (6.1 Billion $, green field and privatization).

Watching the evolution of the FDI in Romanian economy (Figure 1), we can say that it was characterized by constant and little incomes for almost entire period and, in the same time, the lack of privatization in "key moments". Exceptions from this „rule" were the last three years when a new trend was established due to the policy of the Romanian Government, the policy of the foreign investors after the last EU enlargement in 2004 and the forecasts of the Romanian economy evolution after the accession into EU in 2007. At the end of 2005, the FDI total stock in Romania was 16,731.7 Mil $ (four times less than Poland which is the main FDI destination in region).

*Figure 1 - The evolution of the FDI stocks and inflows in Romania (1991-2006)*




*Source: NOTR Database. Note: 2006* = Forecast RAFI.*

The general investment climate in the last years, better than in 90s, made possible an improvement of the collaboration between Romanian administration and investors. In the same time, the perception of the Romanian business environment among foreign investors has become positive and, as a result, the ratting, which was given to Romania by international

financial agencies, was upper. That was an asset and encouraged the investors. Even for 2006/2007 the previsions were favorable and the Romanian authorities expected FDI inflows at an upper level than in 2005 (the total inflows from green field and privatization made in 2006 can increase the annual stock up to 10 Bil $).

From the table 1, we can distinguish three forms of attitude of the foreign investors during transition (Voicilas, 2006):

- A defensive attitude, which characterizes the majority of the period, with little FDI, less than 6% from total (period 1992-2000);
- A prudent attitude, which characterizes a few years of the period, with a FDI policy in expectation and investments between 6-10% from total (1991, 2001-2003);
- An offensive attitude, which characterizes the last years, with intensive investments, more than 15% from total (2004-2005).

*Table 1 – FDI indicators in Romania (1991-2005)*

| Indicator | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inflows in total stock (%) | 6.32 | 3.43 | 2.50 | 5.27 | 1.42 | 3.43 | 2.15 | 4.52 | 5.64 | 5.02 | 9.21 | 6.45 | 7.70 | 18.12 | 18.82 |
| Average stock (Mil. $) | 1058.3 | 815.8 | 683.1 | 732.8 | 633.8 | 623.7 | 586.0 | 607.2 | 644.7 | 664.1 | 743.8 | 771.7 | 811.5 | 970.1 | 1115.4 |
| Average stock per capita (Thou. $) | 48.8 | 75.3 | 94.5 | 135.2 | 146.2 | 172.6 | 186.9 | 221.8 | 265.4 | 304.1 | 375.2 | 424.9 | 484.4 | 626.0 | 771.7 |
| Average inflows per capita (Thou. $) | 48.8 | 26.4 | 19.3 | 40.7 | 11.0 | 26.5 | 14.3 | 34.8 | 43.6 | 38.7 | 71.1 | 49.7 | 59.4 | 139.9 | 145.3 |

*Note*: We considered the population constant at the level of the year 2002 (21,680,974 inhabitants).
*Source: Voicilas, D.M., 2005. Special study, Foreign direct investment in South-East Europe – overview on Romania and Bulgaria. In: Chojna, J. (Supervisor), Foreign Investments in Poland – Annual Report. ISSN 1231-1111, Foreign Trade Research Institute, Warsaw, Poland, 208-229; Calculations based on NOTR Database; NIS Database.*

"The concave evolution" of the average FDI in total stock, in the whole period, is an evidence of the attitude of the foreign investors and their response to the political and economical climate in Romania (Voicilas, 2006). The concavity is a result of the withdrawal of the foreign investors from the Romanian market, for a period of time, due to the lack of political stability and reforms in economy during 90s. The changes in the last years have attracted the investors again.

The last two indicators from the table 1 show us that Romania recovered a part of "the time lost" in 90s and it is closer to the values recorded in other countries in Central and Eastern Europe (CEE) or even some countries from South and Eastern Europe (SEE), like Croatia and Bulgaria.

In these conditions, Romania becomes a principal receiver of FDI in SEE. It is still behind countries from CEE, like Poland, Hungary and Czech Republic (taking into account indicators like FDI stock, FDI inflows, average stock/capita or average inflows/capita), but the tendencies are encouraging. With about 1/3 from the total investments made in these countries (analyzed separately) in the last fifteen years, the gap between Romania and the main CEEC is still big.

## The regional analysis of the foreign direct investments

A regional analysis in Romania shows major differences at all levels and in many fields. Among the eight Romanian economic development regions, there are a few which have closer indicators with the level of other countries in EU (especially among New Member States – NMS), but still many other far from the requirements of an EU member.

The territorial repartition of the FDI for all activity sectors of the economy puts into evidence some of the trends manifested by the investors in 90s. As result, there are emerging centers of concentration for the foreign investors in those geographical areas and historical provinces with a rich economic and infrastructure potential or with historical traditions in certain activity branches.

*Table 2 - FDI in Romania by economic development regions (1991-2005)*

| Development regions | Investors | | Capital | | Rural population | Regional population |
|---|---|---|---|---|---|---|
| | No. | % | Mil. $ | % | % | % |
| Northeast | 4749 | 4.0 | 523.7 | 3.1 | 59.5 | 17.1 |
| Southeast | 6496 | 5.5 | 1483.6 | 8.9 | 44.8 | 13.2 |
| South | 4781 | 4.0 | 1663.3 | 9.9 | 59.5 | 15.6 |
| Southwest | 2975 | 2.5 | 270.8 | 1.6 | 55.8 | 10.8 |
| West | 12858 | 10.8 | 1075.7 | 6.4 | 38.4 | 8.9 |
| Northwest | 11622 | 9.8 | 912.2 | 5.5 | 49.9 | 12.6 |
| Center | 11132 | 9.3 | 811.5 | 4.9 | 41.5 | 11.6 |
| Bucharest | 64507 | 54.1 | 9990.9 | 59.7 | 11.3 | 10.2 |
| Total | 119120 | 100.0 | 16731.7 | 100.0 | 46.7 | - |

*Source: NOTR Database; NIS Database.*

When we analyze the distribution of the foreign investors taking into consideration the number of the commercial companies (Table 2), we can see that about half (54.1%) have been founded in Bucharest, which anyhow has the supremacy regarding the value of the invested capital, with almost 60%. The second group of regions, on the subsequent place is: the West Region, Northwest Region and Center Region (between 9-11%). The fewest commercial companies were founded in Southwest Region (only 2.5%). If we have in view the value of the investments, after Bucharest is following the South Region and Southeast Region. These three regions gather almost 80% of the total FDI in Romania. On the last place is the Southwest Region.

Following these two criteria, we can conclude that the Bucharest Region is

concentrating the greatest part of the foreign investments in Romania, the rest (about 40%) being shared by the other seven regions of economic development, existing a great economic imbalance manifested in all domains of activity. The least attractive region for the foreign investors is Southwest, which is on the last position in function of both criteria. It is in fact one of the poorest regions in Romania, together with the Northeast Region, with a rural majority and a strong agrarian character (almost 60% from the population is rural). Both regions have 28% from the Romanian population but they cumulate only 4.7% from the total FDI. An exception is the South Region, which has a rural character, over 15% from the Romanian population but high level of investments.

Generally, the foreign investors avoided the poorest regions in Romania, the rural environment, preferring the towns or the adjacent areas. The regional distribution of the FDI in Romania is characterized by great inequalities, the one between the Bucharest Region and the other regions being most obvious and the second between rural and urban area.

## The regional analysis of the efficiency

In this chapter we will show in which way the FDI evolution influenced the main macroeconomic indicators in the Romanian economy and regions. We take into consideration the evolution of the following indicators: GDP, GVA and FGCF. The calculation of the efficiency of the FDI is based on the following indicators: FDI fertility, FDI efficiency coefficient, Capital efficiency. Each calculation will be done at national and regional level.

*FDI Fertility*

The indicator shows the efficiency of the FDI utilization reflected by the ratio of the GDP and FDI variations. In the table 3, we present the results of the calculation based on the following formula (Romanu&Vasilescu, 1993):

$$Ef(a/b) = \Delta GDP/\Delta FDI; \quad (1)$$

Where a=initial moment; b=the moment for comparison.

*Table 3 – FDI fertility ($)*

| Ef | 2005/1991 | 2005/2004 | 2004/2003 | 2003/2002 | 2002/2001 | 2001/2000 | 2000/1999 | 1993/1992 | 1992/1991 |
|---|---|---|---|---|---|---|---|---|---|
| **National level** | | | | | | | | | |
| **Value** | 9.021 | 6.476 | 4.668 | 5.952 | 4.800 | 3.717 | 1.671 | 0.585 | 0.344 |
| **Regional level** | | | | | | | | | |
| **Value** | Northeast | | | | | | | | |
| | 5.012 | 2.352 | 2.012 | 2.566 | 1.798 | 1.988 | 1.001 | 0.022 | 0.022 |
| | Southeast | | | | | | | | |
| | 9.011 | 8.229 | 5.044 | 6.322 | 3.265 | 3.285 | 1.889 | 0.836 | 0.092 |
| | South | | | | | | | | |
| | 9.584 | 9.566 | 7.281 | 6.873 | 4.232 | 2.899 | 2.285 | 0.877 | 0.595 |
| | Southwest | | | | | | | | |
| | 4.363 | 4.025 | 2.233 | 2.749 | 3.162 | 1.012 | 1.027 | 0.066 | 0.033 |
| | West | | | | | | | | |
| | 5.892 | 6.787 | 4.399 | 5.244 | 5.963 | 3.239 | 1.869 | 1.002 | 0.059 |
| | Northwest | | | | | | | | |
| | 7.255 | 5.365 | 4.211 | 7.241 | 4.466 | 4.819 | 1.242 | 0.514 | 0.099 |
| | Center | | | | | | | | |
| | 6.886 | 6.232 | 4.178 | 5.978 | 4.246 | 2.633 | 1.533 | 0.161 | 0.853 |
| | Bucharest | | | | | | | | |
| | 24.168 | 9.256 | 7.989 | 10.641 | 11.269 | 9.865 | 2.525 | 1.201 | 1.003 |

*Source: Own calculation based on NIS and NOTR Data.*

At national level, the FDI fertility increased in the last years. The level of FDI and GDP increased in the same time but not in the same proportion. It is evident the connection between FDI and the growth of the GDP especially after 2000 when the FDI contribution is bigger than in previous period. At the beginning of 90s the impact of FDI on GDP was small and the activities were not efficient because the values were little. The ratio shows that for one unit of FDI there was obtained less than one unit of GDP.

At regional level, the general tendency was that the values increased from year to year. With little exceptions, the regional values followed the national average. Generally, the biggest values were in Bucharest Region for the entire period, which express the highest fertility in Romania. Higher values compared with the national average were met in South, Southeast and West regions. In the same time, the smallest values were met in Southwest and Northeast regions, which had inefficient activity at the beginning of 90s, small GDP contribution at the national level and small FDI values, as well.

*FDI Efficiency Coefficient*

The indicator is a ratio between the variation of the GVA and FDI and shows the progress of the GVA for every additional FDI unit. We use the following formula (Romanu&Vasilescu, 1993):

$$Ee(a/b) = \Delta GVA/\Delta FDI; \quad (2)$$

Where a=initial moment; b=the moment for comparison.

*Table 4 - FDI efficiency coefficient ($)*

| Ee | National level | Regional level | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Northeast | Southeast | South | Southwest | West | Northwest | Center | Bucharest |
| 2005/1991 | 19.187 | 10.261 | 22.233 | 25.652 | 11.285 | 19.412 | 18.471 | 15.639 | 30.542 |
| 2005/2004 | 14.932 | 11.263 | 16.852 | 19.463 | 9.052 | 15.396 | 14.245 | 12.865 | 20.326 |
| 2004/2003 | 10.700 | 8.523 | 12.042 | 11.715 | 9.429 | 11.003 | 10.058 | 10.002 | 12.826 |
| 2003/2002 | 5.979 | 5.229 | 6.115 | 6.525 | 4.998 | 5.224 | 6.004 | 5.551 | 8.188 |
| 2002/2001 | 4.361 | 3.022 | 3.986 | 4.661 | 3.262 | 4.007 | 5.080 | 4.981 | 5.887 |
| 2001/2000 | 2.139 | 1.006 | 2.120 | 1.925 | 1.000 | 1.869 | 1.522 | 1.687 | 5.983 |
| 2000/1999 | 1.955 | 0.996 | 1.886 | 2.382 | 1.056 | 1.535 | 1.642 | 2.121 | 4.023 |
| 1993/1992 | 0.396 | 0.066 | 0.285 | 0.589 | 0.011 | 0.125 | 0.187 | 0.050 | 1.852 |
| 1992/1991 | 0.239 | 0.003 | 0.011 | 0.120 | 0.001 | 0.052 | 0.012 | 0.060 | 1.655 |

*Source: Own calculation based on NIS and NOTR Data.*

The efficiency increased from year to year (as we see in table 4). The biggest values were after 2000 (a very efficient activity) and the smallest at the beginning of 90s (when was an inefficient activity). Generally, Bucharest Region was on the first place with a strong influence on national GVA and values above the national average. Good influence had also South and Southeast regions. Inefficiency and bad influence on national average had Northeast and Southwest regions.

*Capital Efficiency*

The indicator expresses the modification of the fixed gross capital formation under the influence of the FDI. The formula used is (Romanu&Vasilescu, 1993):

$$Ec(a/b) = \Delta FGCF/\Delta FDI; \quad (3)$$

Where a=initial moment; b=the moment for comparison.

*Table 5 - Capital efficiency ($)*

| Ec | National level | Regional level | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Northeast | Southeast | South | Southwest | West | Northwest | Center | Bucharest |
| 2005/1991 | 6.304 | 5.021 | 7.014 | 7.526 | 4.122 | 5.898 | 5.042 | 6.822 | 8.985 |
| 2005/2004 | 4.397 | 3.228 | 4.868 | 4.152 | 4.001 | 4.286 | 4.821 | 3.996 | 5.822 |
| 2004/2003 | 3.798 | 3.006 | 3.966 | 4.581 | 3.020 | 4.011 | 3.928 | 3.183 | 4.686 |
| 2003/2002 | 2.393 | 2.323 | 2.588 | 2.983 | 1.866 | 1.986 | 2.055 | 2.171 | 3.176 |
| 2002/2001 | 1.489 | 1.007 | 1.854 | 1.798 | 1.151 | 1.352 | 1.384 | 1.279 | 2.084 |
| 2001/2000 | 0.812 | 0.574 | 0.985 | 0.876 | 0.289 | 0.677 | 0.718 | 0.499 | 1.875 |
| 2000/1999 | 0.527 | 0.158 | 0.528 | 0.579 | 0.227 | 0.379 | 0.293 | 0.455 | 1.599 |
| 1993/1992 | 1.041 | 0.582 | 0.957 | 1.766 | 0.421 | 0.900 | 0.875 | 1.003 | 1.827 |
| 1992/1991 | 0.751 | 0.400 | 1.074 | 1.005 | 0.436 | 0.541 | 0.763 | 0.498 | 1.290 |

*Source: Own calculation based on NIS and NOTR Data.*

The activity was efficient and the FDI influence on the FGCF was positive after 2002 when were recorded values bigger then one (the results of the calculation are presenting in table 5). Till that time, the FDI influence on the FGCF was small. Bucharest Region had a decisive contribution in all years and the activity was efficient. For the rest of the Romanian regions, important contributions had South and Southeast regions with an efficient activity in many years (even before 2001) and weak contributions had Northeast and Southwest regions, generally with values bellow the national average.

## Conclusions

From the analysis of the FDI and efficiency in the Romanian economy and regions, certain conclusions can be drawn that come to consolidate their increasing role for economic growth, modernization and consolidation of the market.

In Romania, FDI evolution after 1990 had the general trend like in all transition countries; however, its particularity was that the frequency of changes and sometimes the lack of coherence and consistency of authorities strongly influenced the attracted foreign capital. At present, Romania is behind its main competitors in CEE (countries like Poland, Hungary or Czech Republic), but ahead of many other countries especially from SEE. In 90s, the investment policy and the negative image of the Romania on the international financial markets determined little inflows of FDI, which had negative effects on the macroeconomic indicators and the evolution of the regions. Due to these reasons, the performances of the economy were weak. Generally, the evolution of the economy was like a concave curve and the level of the macroeconomic indicators recorded before 1990 were reached just in 2004-2005.

The Romanian regions are characterized by huge disparities. The most obvious is between Bucharest and the rest of the regions. The repartition of the FDI between regions is unbalanced and we can identify less developed regions like Northeast and Southwest or richer and more attractive regions like South and Southeast. Important FDI were done in Bucharest and surroundings (about 60% from total FDI in Romania) and the economic development regions from South of Romania. The East and West regions did not have the same attractively for investors. Considering that 10% from the Romanian population has benefited of 60% from the total FDI in Romania, we can imagine that the effects on the economy and regions are different. The disparities appear in all sectors of activity. Agriculture and rural area have an important role, because the less developed regions are mostly rural, with a large number of agricultural workers, unemployed workers (or hide unemployment), little performances and efficiency. All these will have a direct influence on the evolution of the regions inside EU market.

The FDI impact is different in Romanian regions. Analyzing the influence of the FDI on the macroeconomic indicators and the efficiency of the FDI, we can conclude that an efficient activity and strong positive influences on the economy was only after 2000. Before this year, the influences were small. The main contribution had Bucharest that registered values above the national average. After 2000, important contributions

and efficient activity had other two regions, South and Southeast but, in the same time, weak performances had regions like Northeast and Southwest. Between them, there is a group of three regions (West, Northwest and Center) that had efficient activity in many years but the values were under the national average.

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Economics of agriculture
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UDK: 631.15 (498)

# THE STRUCTURE OF PRODUCTION IN ROMANIAN AGRICULTURE - THE GAP BETWEEN THE EU27

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## Abstract

*The paper aims to capture the differences between the production structures of different countries and differences existing in some respects, between Romania and EU. In achieving this, the comparison and analysis methods of statistical data are used. Results show that gaps between agriculture of EU27 countries are found in terms of expansion known by different industries and cultures, rather than the kind of branches practiced.*

*Different production structures and, particularly, development of agriculture of various countries generate differences on synthetic results obtained by them and their contribution to economic growth. Such a thing must be a strong reason for reflection and, in particular, for action for all those directly connected to the situation of Romanian agriculture.*

Key words*: structure of production, livestock, plant production, yield*

## Introduction

Characterization of the structure of production in the EU, to the existence of the 27 member countries, sharing an area of approx. 4 million km$^2$, is a complex process. An overall assessment on the structure of EU agriculture production 27 shows evidence that it contains branches and cultures, in greater or lesser extent, that are found in all countries. Differences between countries have multiple determinations. It is recognized the role of climate and soil conditions and whether they meet the requirements of

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different industries and cultures. It is recognized also that they interfere with restrictive, prohibiting so, the practice of crops in some areas. Soil and climate conditions, with few exceptions, such as removal of drought with irrigation, correcting acid soil reaction or providing nutrients can not be corrected to make them conducive to certain cultures. Naturally, there are areas of favourability in each country for different crops. Overall, agricultural area of a country is suitable for certain uses and these are favourable for different cultures. As a result, quite rightly, it is estimated that agricultural production in one country can not be outsourced from one area or another as it happens with the industrial.

## Material and method

For this work to appeal to documentation and data obtained from the European statistics. Likewise, the comparison method was used to capture the differences between the production structures of different countries and differences existing in some respects, between Romania and EU (reporting being done in some countries and, obviously, the EU average). Along with analysis and comparison to appeal and consolidated, taking into account the volume of information, diversity of branches of production with the variety of natural and economic conditions of the 27 EU countries

## Results and discussions

### *Plant production*

The branch prevalent in EU agriculture in crop production is **cereals.** On average, they hold almost 31% of agricultural area used. For different reasons, there are countries where the share of cereals is higher and, of course, the other where is lower. Primarily, cases are determined by the area held by grain, but also the structure of how to use the land for the purposes of its share of incumbent categories of use: pastures and natural meadows, vineyards and orchards. Thus, in the case of Romania, where the share of cereals the land area was 64.9%, in 2006, due to areas held by the above categories use their share in agricultural land use was only 35.9%. It seems more relevant the share of cereals in arable land, when it is high shows that they extend to the detriment of other branches, by printing a highly grain farming. However, a developed agriculture requires a diversified production structure, taking into account the specific conditions, paying attention to other branches; their role is recognized in ensuring a balanced diet for the population and raw materials for various industries for processing and to meet other needs of the economy.

There are other countries where the share of cereals in the agricultural area used it is above the European average, while others have weights lower than average. Higher share of cereals held Denmark - 55.1% and Poland - 52.5% (Table 1).

**Branch of oil seed crops** is found mainly in two crops: rapeseed and sunflower, their share per countries being different. In most countries the prevailing culture is

rape, except Romania, Bulgaria, Hungary and Italy. Climatic reasons or because the sunflower is a rapacious culture in the use of soil nutrients, or that consuming olive oil or imported, this culture is extended only in a few countries, including Romania (the biggest area planted). Share of oil country cultures is usually below 10%.

*Table 1 – Share of cereals in agricultural utilized area, EU27, 2007 (%)*

| No. | Country | Country | | No. | Country | Country | |
|---|---|---|---|---|---|---|---|
| | | Above average | Under average | | | Above average | Under average |
| **1** | Belgium | | 23,8 | **15** | Luxemburg | | 22,3 |
| **2** | Bulgaria | | 29,7 | **16** | Hungary | 48,8 | |
| **3** | Czech | 43,0 | | **17** | Malta | - | - |
| **4** | Denmark | 55,1 | | **18** | Netherlands | | 11,5 |
| **5** | Germany | 39,5 | | **19** | Austria | | 24,0 |
| **6** | Estonia | 36,8 | | **20** | Poland | 52,5 | |
| **7** | Ireland | | 6,6 | **21** | Portugal | | 9,2 |
| **8** | Greece | | 26,2 | **22** | Romania | 35,9 | |
| **9** | Spain | | 25,0 | **23** | Slovenia | | 19,6 |
| **10** | France | | 27,9 | **24** | Slovakia | 38,2 | |
| **11** | Italy | | 24,3 | **25** | Finland | 50,1 | |
| **12** | Cyprus | 38,2 | | **26** | Sweden | | 30,05 |
| **13** | Latvia | | 27,6 | **27** | UK | | 17,1 |
| **14** | Lithuania | 34,5 | | **28** | **EU27 average 30.8 %** | | |

*Source: EUROSTAT*

**Vegetables** do not have a significant share in the agricultural area used, the European average being 0.9%. Over the medium lies there are: Lithuania (1.5%), UK (1.4%), Austria (1.3%), Spain (1.3%), and France (1%). For Romania, the share of legumes is 0.5%

**Fresh vegetables** have also low shares. Large growing vegetables are: Italy, France, Poland, United Kingdom, Hungary, and the Netherlands.

**Green fodder** accounts in EU 27 for 3.9% of agricultural area used, more than 7 million hectares cultivated. According to available data, green fodder ranks third in production structure, after cereals and oilseeds. Share of this branch reached in some cases to 15%. Of course, here comes the link between industry and the development of livestock in each country. With a livestock rising mostly traditional, Romania cultivates feed on an area accounting for 1.3% of agricultural area used. In providing forage base involved, of course, pastures and natural grassland, but also secondary production from field crops (fodder containing low nutrient). Extension of forage crops are related to livestock development.

**Sugar beet** is grown in the EU27 in a proportion of only 1% of agricultural area used. By country, areas held by the beet are relatively low. The largest proportion

(6%) is met in Belgium. Significant levels of surface cultivated with beet are found in countries such as France (379 thousand ha), Germany (358 thousand ha), Poland (262 thousand ha), United Kingdom (131 thousand ha) etc. Romania cultivates, usually, 40 thousand hectares.

**Potatoes** have, at European level, a slightly larger share (1.2%) compared to beet. All EU countries grow, in larger or smaller areas, potatoes. For Romania, the share held by potato (2%) is higher than the European average. The degree of extension of this culture is determined by multiple forms in which potatoes are found in food consumption by the people, but also other economic uses.

**Viticulture** knows a significant expansion in several countries. Here as well, the climate shows its role fully. Where summers are warm and there are other conditions, the vine has significant share in the agricultural area under cultivation: Italy (5.3%), France (2.6%), Cyprus (5.4%), Greece (2, 3%), Portugal (5.9%), and Slovenia (3.3%). For Romania, the vineyards have used 1.3% of agricultural area; its trend is decreasing after 1989.

***Livestock***

In animal husbandry situation presents a higher degree of homogeneity because it increases the same species, the main ones being: cattle, swine, sheep and poultry. The explanation is that among the determinants of production structure the importance of natural conditions decreases, which influences the production structure of plant branch.

**Cattle** are found in all countries (Table 2). Herds are different per countries. Countries with the largest agricultural area used for growing have many animals and the density of animals at 100 meters is the highest. Thus, France is the first of their surface and the livestock.

Further, the hierarchy changes, Germany and the UK stood better in this regard: places 2 and 3 respectively (3 and 4 respectively by area). Spain ranks 4, Italy ranks 5, and Ireland ranks 6 (10 by area). Romania ranks 7 by area, but it ranks 9 per number of animals.

At the opposite pole there are countries that have reduced agricultural area, compared to those mentioned above, but large livestock (Belgium has an agricultural area of more than 10 times lower than Romania, but it has almost the same number of animals - 2.573 million head; Netherlands grown more animals than Romania, but has an agricultural area of 7.5 times less).

The density of animals in 100 hectares of agricultural land is very different. High levels of it, far above the European average (48.1 heads), meet in: Netherlands (201 heads), Malta (190 heads), Belgium (186.2 heads), Luxembourg (149.6 heads), Ireland (138.5 heads). With a density of 20 head on 100 ha land used, Romania is one of the last places (24) in the EU. Romania has a low concentration of the herd of cattle on farms. Compared to a European average of 24 heads, Romania has only 2.2 heads. It is the lowest concentration of the bovine met in the EU27.

**Pigs** are a species found, naturally, in all EU countries, where there are no religious restrictions (Table 3). Large countries have the largest number of pigs.

*Table 2 – Number of cattle, 2007*

| No. | Country | UAS* 1000 ha | Stocks 1000 heads | % of UE27 | No.of heads per 100 ha | Place of each country after: | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | UAS | Stocks | No.of heads per 100 ha |
| 1 | Belgium | 1382 | 2573 | 2.9 | 186.2 | 22 | 10 | 3 |
| 2 | Bulgaria | 5190.1 | 20611 | 0.7 | 11.8 | 9 | 19 | 27 |
| 3 | Czech | 3566 | 1367 | 1.5 | 38.3 | 13 | 15 | 15 |
| 4 | Denmark | 2712 | 1545 | 1.7 | 57.0 | 17 | 12 | 11 |
| 5 | Germany | 16951 | 12707 | 14.3 | 75.0 | 3 | 2 | 7 |
| 6 | Estonia | 762 | 4242 | 0.3 | 31.8 | 23 | 24 | 19 |
| 7 | Ireland | 4261.1 | 5902 | 6.6 | 138.5 | 10 | 6 | 5 |
| 8 | Greece | 3964 | 682 | 0.8 | 17.2 | 11 | 19 | 25 |
| 9 | Spain | 24744 | 6585 | 7.4 | 26.6 | 2 | 4 | 21 |
| 10 | France | 32346 | 19124 | 21.5 | 59.1 | 1 | 1 | 10 |
| 11 | Italy | 14710 | 6577 | 7.4 | 44.7 | 6 | 5 | 13 |
| 12 | Cyprus | 169 | 656 | 0.1 | 33.1 | 25 | 26 | 18 |
| 13 | Latvia | 1855 | 399 | 0.4 | 21.5 | 21 | 23 | 23 |
| 14 | Lithuania | 2791 | 788 | 0.9 | 28.2 | 16 | 17 | 20 |
| 15 | Luxemburg | 129 | 193 | 0.2 | 149.6 | 26 | 25 | 4 |
| 16 | Hungary | 5809 | 705 | 0.8 | 12.1 | 8 | 18 | 26 |
| 17 | Malta | 10 | 19 | 0.0 | 190.0 | 26 | 27 | 2 |
| 18 | Netherlands | 1899 | 3820 | 4.3 | 201.2 | 20 | 8 | 1 |
| 19 | Austria | 3240 | 2000 | 2.2 | 61.7 | 14 | 11 | 8 |
| 20 | Poland | 15957 | 5406 | 6.1 | 33.9 | 5 | 7 | 17 |
| 21 | Portugal | 3767 | 1443 | 1.6 | 38.3 | 12 | 14 | 16 |
| 22 | Romania | 14117 | 2819 | 3.2 | 20.0 | 7 | 9 | 24 |
| 23 | Slovenia | 491 | 480 | 0.5 | 97.8 | 24 | 22 | 6 |
| 24 | Slovakia | 1939 | 502 | 0.6 | 25.9 | 19 | 21 | 22 |
| 25 | Finland | 2301 | 903 | 1.0 | 39.2 | 18 | 16 | 14 |
| 26 | Sweden | 3150 | 1517 | 1.7 | 48.2 | 15 | 13 | 12 |
| 27 | UK | 16761 | 10078 | 11.3 | 60.1 | 4 | 3 | 9 |
| 28 | Total EU 27 | 184992 | 89042 | 100.0 | 48.1 | * | * | - |

*Utilized agricultural surface

*Source: EUROSTAT*

Germany is situated in the first place, with 27.113 million heads, or 16.0% from the EU 27. Very close is Spain, 16.3%, followed by Poland, 11% of pigs. France and, in particular, Italy and the UK grow less effectives compared with the countries mentioned above.

With 6.565 million head, Romania has 4.1% of the number of pigs in EU-27. It ranks 8.

In the year 2007, there is a general tendency to reduce the number of pigs, including in Romania, although its potential as arable land is much higher. Only 9 countries have registered increases of effective. The overall EU-27 reduction was 1.2%.

*Table 3 – Number of pigs*

| No. | Country | 2007 - 1000 heads - | 2008 - 1000 heads - | % of EU27 | % 2008/2007 | Place in EU, after no.of pigs, 2008 |
|---|---|---|---|---|---|---|
| 1 | Belgium | 6304 | 6200 | 3,9 | -1,6 | 9 |
| 2 | Bulgaria | 1013 | 889 | 0,6 | -12,3 | 21 |
| 3 | Czech | 2741 | 2662 | 1,7 | -2,9 | 13 |
| 4 | Denmark | 13613 | 13170 | 8,2 | -3,3 | 5 |
| 5 | Germany | 26821 | 27113 | 16,9 | 1,1 | 1 |
| 6 | Estonia | 341 | 375 | 0,2 | 9,8 | 25 |
| 7 | Ireland | 1620 | 1575 | 1,0 | -2,8 | 16 |
| 8 | Greece | 1033 | 1038 | 0,6 | 0,5 | 18 |
| 9 | Spain | 26219 | 26061 | 16,3 | -0,6 | 2 |
| 10 | France | 15009 | 14968 | 9,4 | -0,3 | 4 |
| 11 | Italy | 9281 | 9273 | 5,8 | -0,1 | 7 |
| 12 | Cyprus | 453 | 472 | 0,3 | 4,2 | 23 |
| 13 | Latvia | 417 | 414 | 0,3 | -0,6 | 24 |
| 14 | Lithuania | 1127 | 923 | 0,6 | -18,1 | 20 |
| 15 | Luxemburg | 87 | 86 | 0,1 | -0,7 | 26 |
| 16 | Hungary | 3987 | 3871 | 2,4 | -2,9 | 11 |
| 17 | Malta | 74 | 77 | 0,0 | 4,3 | 27 |
| 18 | Netherlands | 11220 | 11710 | 7,3 | 4,4 | 6 |
| 19 | Austria | 3139 | 3286 | 2,1 | 4,7 | 12 |
| 20 | Poland | 18813 | 17621 | 11,0 | -6,3 | 3 |
| 21 | Portugal | 2296 | 2374 | 1,5 | 3,4 | 14 |
| 22 | Romania | 6815 | 6565 | 4,1 | -3,7 | 8 |
| 23 | Slovenia | 575 | 543 | 0,3 | -5,7 | 22 |
| 24 | Slovakia | 1105 | 952 | 0,6 | -13,8 | 19 |
| 25 | Finland | 1435 | 1427 | 0,9 | -0,6 | 17 |
| 26 | Sweden | 1662 | 1728 | 1,1 | 4,0 | 15 |
| 27 | UK | 4731 | 4674 | 2,9 | -1,2 | 10 |
| 28 | Total EU 27 | 161929 | 160046 | 100,0 | -1,2 | * |

*Source: EUROSTAT*

**Sheep and goats** are the species to which Romania is presented better, holding, in 2007, 4th in the first species and 5th in the second species, among EU-27 countries (Table 4).

The sheep are concentrated in 12 countries, which have each more than 1 million heads. Other countries have herds of sheep and goats less important. The most important are, by effective, the United Kingdom (23.723 million head), Spain (22.194

million head) - the two countries, holding nearly half (47.9%) of the sheep of the EU-27, being remote from other countries, following the Greece with 8.984 million head, after coming: Romania (8.469 million head). It is possible for some of these countries to have a tradition of very important.

In **goat growing** situation is somewhat similar to that in sheep. The largest upward is Greece, followed by Spain, Romania being at the place 5. Goats are concentrated mainly in three countries - Greece, Spain and France, which together account for 68.1% from the existing EU-27. In EU agriculture, goat is the least developed.

*Table 4 – Number of sheep and goats*

| No | Country | Sheep | | Goats | | No | Country | Sheep | | Goats | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1000 heads | % of EU | 1000 heads | % of EU | 1000 heads | % of EU | 1000 heads | % of EU | 1000 heads | % of EU |
| 1 | Belgium | 146 | 0.2 | 25 | 0.2 | 15 | Luxemburg | 8 | 0.0 | 3 | 0.0 |
| 2 | Bulgaria | 1526 | 1.6 | 496 | 3.7 | 16 | Hungary | 1232 | 1.3 | 67 | 0.5 |
| 3 | Czech | 184 | 0.2 | 17 | 0.1 | 17 | Malta | 12 | 0.0 | 6 | 0.0 |
| 4 | Denmark | 98 | 0.1 | 0 | 0.0 | 18 | Netherlands | 1715 | 1.8 | 355 | 2.7 |
| 5 | Germany | 1926 | 2.0 | 180 | 1.4 | 19 | Austria | 351 | 0.4 | 61 | 0.5 |
| 6 | Estonia | 74 | 0.1 | 4 | 0.0 | 20 | Poland | 316 | 0.3 | 144 | 1.1 |
| 7 | Ireland | 3531 | 3.7 | 7 | 0.1 | 21 | Portugal | 3365 | 3.5 | 514 | 3.9 |
| 8 | Greece | 8984 | 9.4 | 4931 | 37.0 | 22 | Romania | 8469 | 8.8 | 865 | 6.5 |
| 9 | Spain | 22194 | 23.2 | 2892 | 21.7 | 23 | Slovenia | 131 | 0.1 | 28 | 0.2 |
| 10 | France | 8285 | 8.6 | 1250 | 9.4 | 24 | Slovakia | 347 | 0.4 | 38 | 0.3 |
| 11 | Italy | 8237 | 8.6 | 920 | 6.9 | 25 | Finland | 90 | 0.1 | 5 | 0.0 |
| 12 | Cyprus | 292 | 0.3 | 368 | 2.8 | 26 | Sweden | 521 | 0.5 | 6 | 0.0 |
| 13 | Latvia | 54 | 0.1 | 13 | 0.1 | 27 | UK | 23723 | 24.7 | 96 | 0.7 |
| 14 | Lithuania | 43 | 0.0 | 20 | 0.1 | 28 | Total EU27 | 95855 | 100.0 | 13310 | 100.0 |

*Source: EUROSTAT*

Regarding **poultry**, there are natural differences between countries in the EU-27. As a result, there are large countries increasing laying hens - Germany, Italy, Spain, and France, followed by Romania, United Kingdom, Poland and the Netherlands. The situation is similar to chicken, only the first is the United Kingdom, followed by France, Spain, Germany and Italy. Romania has a weaker position than in chickens. Its potential grain would actually require a higher position.

## Conclusions

The main conclusion is that there are significant gaps in the structure of production between Romania and other EU countries. The reasons supporting this conclusion are different, from natural conditions specific to each country, to the socio-economic (level of development of each country), political (in terms of supporting the development of certain branches), cultural (consumption habits), etc. Here are some possible causes and explanations of these differences.

1. There are a variety of production structures in the EU, less by the type of branches

and more in the degree of extension of each of them.
2. Natural conditions have an important role, leading, of course, to differences between the structures of production of agriculture in EU countries.
3. Romania discrepancies are found in the reduced share of branches that have roles in the diversification of agricultural production and economic performance - fruit growing, viticulture, vegetable growing. They provide higher values of yield.
4. In animal husbandry, herds, by species, are lower than those of countries that have utilized agricultural area near the size held by Romania, but also to those of other countries where this is less than in our country.
5. In Romania, animal products are obtained extensive and can compete at holding the title of organic products, because, for providing forage base for livestock, natural pastures and hay fields are used. Romania grown to feed only 1.3% of agricultural area used, given that the EU27 average is 3.9%.
6. Romania maintains a system of extensive livestock mainly because the density of animals in 100 hectares of land used is 20 head, below the European average of 48.1 heads.

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Economics of agriculture
SI – 2
UDK: 636.5 (497.11)

# AN ANALYSIS OF THE SERBIAN POULTRY MEAT SECTOR[1]

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## Abstract

*Worldwide production of poultry meat has a steady growth. In Serbia, however, there has been a significant decrease in poultry population, production and consumption of poultry meat since the early 1990s. Numerous factors contributed to the current situation. Firstly, dramatic shrinking of the market due to the disintegration of former Yugoslavia and then of the Federal Republic of Yugoslavia, followed by the UN sanctions, collapse of big poultry businesses and their unsuccessful privatisation, lack of the state support etc. The paper gives an overview of poultry meat sector in Serbia, including population, production and consumption of poultry meat, and foreign trade. The aim is to examine the current situation in Serbia's poultry meat production and put forward suggestions on improving the sector.*
***Key words**: poultry meat production, consumption, Serbia*

## Introduction

Modern poultry meat production and its consumption in the world show a steady growth (Leenstra et al, 2006). Between 1970 and 2005, the increase in poultry meat production in developing countries was 1042.5 per cent and 227 per cent in developed countries, respectively. Poultry meat accounts for 25 per cent of total meat production and consumption in developed countries, whereas in Serbia, it is 14 per cent of total livestock production with a declining tendency (Škorić, 2006). Dietary and nutritional qualities of poultry meat products are the main factors which explain its attractiveness, especially because rearing chickens requires relatively small investment and short time. Furthermore, frequent outbreaks of cattle diseases in developed countries have had a positive impact on poultry industry, thus resulting in an increasing interest in

1 The paper is a part of the Technological development project No 20021/2008, funded by the Serbian Ministry of Science.

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poultry meat among consumers. This trend is confirmed by the estimated poultry meat production published by FAO (Table 1).

*Table 1. Estimated poultry meat production in millions tons*

| year | 1999 | 2015 | 2030 |
|---|---|---|---|
| Worldwide | 61.9 | 100.6 | 143.4 |
| Developing countries | 31.3 | 59.1 | 93.5 |
| Developed countries | 30.6 | 41.5 | 49.8 |

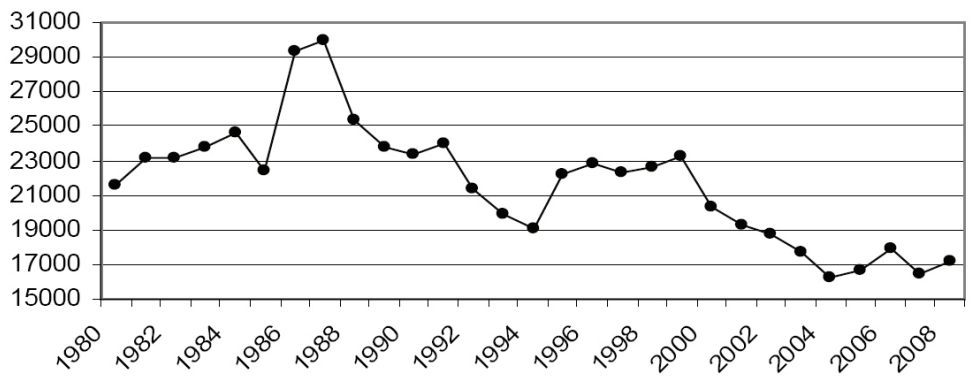
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The paper analyses the current situation in poultry meat production in Serbia, in the period of 1980 – 2008. This study only looks into chicken meat production since it accounts for more than 90 per cent of total poultry production (Krstić and Lučić, 2000). The analyzed data are official statistical data of the Statistical Office of the Republic of Serbia, as well as those taken from related articles and publications. The data on poultry population and poultry meat production refer to Serbia without Kosovo and Metohija. The aim is to examine the current situation in Serbia's poultry meat production and put forward suggestions on improving the sector.

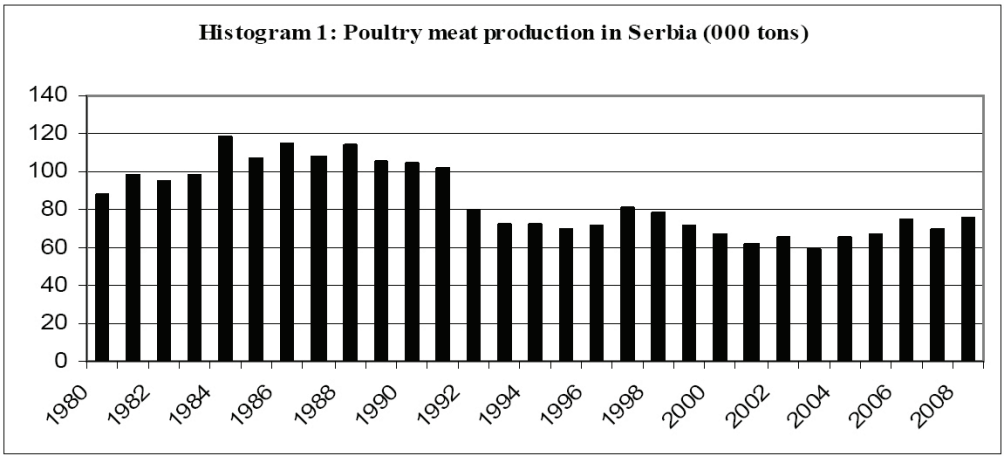
## Results and discussion

The present situation in Serbia's poultry meat production greatly differs from the world trends. To be precise, poultry population (Figure 1), the level of poultry meat production (Histogram 1), and its consumption in the past more than 15 years leads to the conclusion that poultry sector was and still is in a serious crisis.

**Figure 1: Poultry population in Serbia (000 birds)**




*Sours: RZS, http://webrzs.stat.gov.rs/axd/poljoprivreda/rezultats21.php?baza=2*




*Sours: RZS, http://webrzs.stat.gov.rs/axd/poljoprivreda/rezultats21.php?baza=2*

Numerous factors contributed to the current situation. Firstly, dramatic shrinking of the market due to the disintegration of former Yugoslavia and then of the Federal Republic of Yugoslavia, followed by the UN sanctions, collapse of big poultry companies and their unsuccessful privatization, lack of the institutional support etc. The paper gives an overview of poultry population, production and consumption of poultry meat, and foreign trade. According to official statistics, poultry population decreased significantly from almost 30 million birds in the late 1980s to nearly 17 million in 2008 (Figure 1)

Despite this, the data on broiler population in the past three years (table 2) is encouraging, indicating the increasing trend by more than 3.5 times.

*Table 2. Broiler population (000 birds) on December 1st*

| Year | Vojvodina | Central Serbia | Total Serbia |
|---|---|---|---|
| 2007 | 1639 | 545 | 2184 |
| 2008 | 3530 | 2906 | 6436 |
| 2009 | 5618 | 2218 | 7836 |

*Sours: RZS, http://webrzs.stat.gov.rs/axd/poljoprivreda/rezultats21.php?baza=2*

Poultry meat production plays an important role in global meat production and consumption[3]. In the past two decades, the global consumption of poultry has grown much faster compared to other types of meat (annual growth ranged between 3 and 6 per cent) (Tikasz et al, 2009). In 2005, the biggest producers of poultry meat were France, the UK, Spain, Germany and Italy, with more than million tons (Cinar et al, 2009).

Poultry production in Serbia (67,000 tons in 2005) is far behind the leading EU and world producers; and, more importantly, far behind objective potential and opportunities

3 32 per cent of total world meat production in 2007

that exist for this production.

In the early 1960s, Serbia began to introduce commercial production of poultry meat recording high growth rates until the late 1980s (Histogram 1). Dramatic decline in chicken meat production was recorded in the early 1990s (30 per cent less in 2009 than in 1990)[4]. Since then the production and offer of poultry meat has been greatly determined by private sector.

The reasons behind the poor state of poultry production, and poultry sector, can be largely attributed to:

- Declining living standards and purchasing power
- Saturated poultry market which is dominated by a great number of small-scale producers
- Insufficient utilization of genetic potential of parent stocks (less than 65 per cent) (Milosević and Perić, 2002)
- Collapse of big poultry companies and their unsuccessful privatization
- Destruction of grandparent stocks, and unregulated import of genetic hybrids leading to frequent 'flooding' of the market with one-day chickens which is consequently causing low utilization of parent stock (Škorić, 2006)
- Dramatic shrinking of the market due to the disintegration of former Yugoslavia and then the Federal Republic of Yugoslavia
- Non-existence of vertical integration of poultry producers, because of frequently conflicting interests among producers of one-day chickens, broiler producers and slaughterhouses
- Poultry meat frequently comes from unofficial channels, which greatly threaten the production
- Long-time inability to export poultry meat owing to the UN_sanctions, non-compliance of regulations, the absence of institutional support etc, leading to tight competition among producers in small and saturated Serbian market
- Non-existence of interventions by Directorate of Buffer Stock during frequent seasonal fluctuations in supply and demand etc.

Although there are many different systems of poultry production, all of them fall into two main production systems: intensive and extensive ones. The intensive system of rearing broilers is the most common system in poultry production worldwide[5] (Milošević et al, 2006), and also in Serbia. However, it is not the only way of poultry meat production. Extensive and other (semi-intensive) production systems have grown in significance due to the rise in living standards and purchasing power, and the influence of animal welfare organisations.

Serbia's poultry sector comprises three different types of producers:

1. backyard poultry farmers who produce poultry for their own consumption, and market their surplus products in local market, especially at local market places

4 http://webrzs.stat.gov.rs/axd/poljoprivreda/rezultats21.php?baza=2

5 more than 65 per cent of total poultry meat production is realised using highly productive commercial hybrids

2. small and medium scale producers who often have slaughterhouses of small capacity which frequently do not meet required standards
3. big poultry businesses with modern facilities for production and processing of poultry meat (Škorić, 2006)

The exact number of the first two groups of producers is unknown since the majority of them are non-registered, and, generally, they do not have regular customers. It is estimated that these producers account for more than half of total poultry meat production (Rodić et al, 2010). Although some of them work for big poultry companies, which allows them better market access, most of them are engaged in uncontrolled production mainly for local markets (Rodić et al, 2010). The third group of poultry producers, very few of them, supply half of Serbia's market with poultry meat. They are the only ones that own big, intensive commercial farms and modern slaughterhouses, and use the latest production technology.

All three groups of producers are engaged in intensive production. The duration of broiler rearing is 42 – 45 days, mean density is 17 birds/m², feed conversion ratio is less than 2.0, and the mean gross weight of slaughtered chicken is above 2 kg.

The largest number of birds is slaughtered in households, while slaughterhouses account for 25 per cent of total number of slaughtered birds (Vlahović, 2010). The largest commercial producers of poultry meat are meat industry Topiko (associated company of the Perutnina Ptuj Group) and Agroziv, from Pancevo, followed by Vindija, from Plandiste; Yuhor, from Jagodina; Neoplanta, from Novi Sad etc (Vlahović, 2010). The main characteristics of slaughtering industry in Serbia are inefficient use of the present capacities, outdated equipment and technology, as well as lack of modern standardisation. All of this limits and/or prevents export to the EU countries, even transit via the EU countries is banned (Rodić, 2009).

Economic status of poultry meat production can be assessed by looking into business successes of poultry farms and producers. Unfortunately, in Serbia, the picture is rather grim since lately the producers have hardly been making any profit. Their dissatisfaction with low prices of poultry meat is such that they have threatened to process all chicken meat into pâté since only processed products are profitable[6]. The reason for this lies in the fact that processed poultry products require use of specialised technology and compliance with very strict quality standards, thus disabling the development of grey market.

Global increase in poultry consumption can be attributed to many factors, namely the high demand for cheap and also high-protein animal foods. In addition, the consumption is closely linked with standards of living and purchasing power of a population, which is illustrated with the marked rise in poultry meat consumption in Russia and the countries of former Easter Bloc (Magdelaine et al, 2008). In 2006, worldwide consumption of chicken meat was 11.7 kg/capita, in the USA it was 46.2 kg/capita, in Russia 16.7 kg, in the EU – 27 15.8 kg (Cinar et al, 2009). According to Magdelaine et al, in 2008 the biggest consumers in the EU were Hungary and Ireland

6 http://www.mojafarma.rs/index.php/Trziste/Meso/s-piliima-u-minus.html

(34kg/capita/year), then Spain, Great Britain and Portugal (about 30 kg/capita/year), Germany and Italy (about 22.9 kg/capita/year).

Chicken meat consumption, as well as its production, have shown dramatic decline in Serbia, which can be largely contributed to the fall in living standards and purchasing power[7]. According to Stevanović (2009), it is difficult to estimate chicken consumption in Serbia's population due to very opposing and often unreal official data on the consumption. Data on chicken consumption per capita in Serbia differs greatly from author to author. For instance, according to Škorić (2006) the consumption is between 6 and 8 kg/capita; according to Rodić et al (2010), who have used Vlahović and Štrbac's estimates (2006), it is 10 kg/capita; according to Stanković (2010)[8] the consumption is 17.4 kg/capita while Vlahović (2010) estimated that the consumption of chicken meat in 2008 was 18 kg/capita. Even the highest estimated consumption of 18 kg/capita is far below the EU average.

In recent years, chicken consumption has recorded a slight increase in Serbia. This could be attributed to the low cost of poultry meat in comparison with other types of meat. It is realistic to expect that the rise in living standards will lead to the rise in chicken meat consumption.

Both import and export of poultry meat in Serbia is very modest. In 2007-2008, the export of poultry meat was about 2,300 tons (nearly € 4 million), while the import was about 196 tons (about €300,000)[9]. Serbia exports poultry meat to two countries only, namely Montenegro (92 per cent of total export) and Bosnia and Herzegovina (Vlahović, 2010).

## Conclusion

Globally, poultry meat production indicates a steady growth, whereas the situation in Serbia differs markedly. Since the 1990s, there has been a decline in chicken population, poultry meat production and its consumption. The fall in living standards and purchasing power have contributed to this situation. Moreover, the production takes place in a large number of small- scale farms which are badly organised, non-competitive[10], they also lack concentration and specialisation. Finally, non-existence of vertical integration of poultry producers, a large share of grey economy, lack of institutional support, low productivity and obsolete facilities and technology hinder any change and/or development in this branch of animal husbandry.

Despite all the above mentioned, compared to all branches of animal husbandry, poultry is able to revitalise fastest, and thus may offer its products in the EU and

7 According to Škorić (2006) the confirmation lies in the fact that despite dramatic decrease in poultry population and its production, there is still enough poultry meat in the Serbia's market

8 http://www.mojafarma.rs/index.php/Trziste/Trziste/srbija-daleko-iza-evropskih-zemalja-po-potronji-hrane.html

9 http://webrzs.stat.gov.rs/axd/poljoprivreda/rezultatst10.php?ind=1

10 which does not allow them to market their products in hypermarkets, however, as a consequence this can lead to import of poultry meat from countries such as Brazil and the USA

other markets. Serbia has the potential to increase poultry production, as it possesses favourable conditions, it is a net-exporter of corn and soybean and has skilled personnel and scientific potential. However, in order to have production that is competitive to sell products in foreign markets, urgent action in additional investment and adjustment in production systems is needed. Moreover, it is necessary to introduce and co-ordinate new standards and policies on food safety, which majority of poultry producers in Serbia still disregard. There also has to be a greater variety of poultry products on offer in order to follow world trends. Institutional support is indispensible in achieving this. This support should combat grey economy, manage seasonal fluctuations, provide subsidised loans, introduce tax reductions for poultry producers etc.

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Economics of agriculture
SI – 2
UDK: 338.124.4:664/665 (438)

# THE IMPACT OF THE ECONOMIC AND FINANCIAL CRISES ON THE AGRI-FOOD SECTOR IN POLAND

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## Abstract

*The global crisis affected Poland, putting its economic growth in jeopardy. This impact is reflected in deteriorated GDP growth prospects, reduced lending activity, limited access to external financing. Thus, the global crisis has become the key reason for the economic slowdown observed in Poland since mid-2008. Objective of this paper is to analyze the influence of economic crisis on the economic situation in agriculture and food industry in Poland.*

***Key words:*** *polish agro-food sectors, global crisis, foreign trade, macroeconomic conditions, development, food products, agricultural potentials*

## Introduction

The problem of economic crisis seems to be well described in economic sciences at the theoretical level. However, theoretical models of the economy, economic analyses and other studies would be of no avail if not for their practical applications (Fiedor, 2010). Thus, the theories developed by monetarists or representatives of the neoclassical approach constitute the basis for economic and monetary policies pursued by many countries in the world. Nevertheless, the onset of each global economic crisis comes as a surprise, virtually unpreventable, and its causes are difficult to be reliably identified. It is still hard to predict its effects which tend to be very costly and burdensome at the social level.

In the current economic crisis, many countries worldwide (not to say all of them) have resorted to intervention methods. However, is state interference in the economy beneficial to it and what will be the long-term impact of such intervention? Those are the questions which only a handful of economists are willing to answer, and even fewer are capable of doing so. Crises accompanied the fall of great powers,

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played a prominent role in the formation of new empires as well as of economic and social structures. The emergence and development of capitalism represented a streak of economic crises and the accompanying political and social phenomena (Musiał, 2010). The history of civilisation can be seen as a series of crises posing tremendous challenges to people and responses to such challenges.

As a rule, economic crisis today represents complex developments in terms of causes, transmission mechanisms, dynamics and consequences. In general, they are rooted in the functioning of the product markets, currency and banking markets, enterprises and other entities operating in the economy as well as in government policies. There are also multi-directional interactions, not yet full recognised and identified. The disturbances observed in financial markets in 2008 and following years very quickly spread to raw materials markets, including agricultural and food products, which increased the fluctuations and instability of the economic and financial situation of agriculture. The financial crisis has been increasingly affecting economic activities. The characteristic features include:

- due to the globalisation processes in the world economy, the crises are global as well and have hit developed economies and high-growth emerging economies alike and
- the complexity of the current financial systems and strong links between particular elements as well as their role in stimulating demand and economic activity means that the crises have affected all areas of economic life.

Due to the globalisation processes in the world economy, the economic crisis has affected practically all countries in the world, developed and rapidly-growing emerging economies alike. The confidence in the banking system was undermined and economic growth slowed down dramatically.

## Macroeconomic conditions for the development of the Polish food sector during the global crisis

The signs of the economic and financial crises in Poland have been different from those observed in other developed countries, where it surfaced first in the capital market, then hit the banking sector, and finally, in developed economies, affected the whole economy. When assessing the prospects for the Polish economy facing the crises, it should be pointed out that historically economic recessions which are preceded by a financial crisis last longer than those not associated with a financial crisis. Recessions are more severe and last longer if the economy enters a crisis with a number of imbalances, such as a significant current account deficit, budget deficit or lack of household savings. What the Polish economy is currently facing is an economic slowdown rather than a recession. The indebtedness is low and Polish consumers and enterprises are less dependent on loans than those in developed countries. Economies such as Poland's that are however already open to cross-border movement of goods, characterised by high

productivity, lower elasticity of asset substitution and lower fixed costs and are thus better positioned to cope with crises in the economic sector (Wigier, 2010).

Any assessment of Poland's economic situation in the crises period cannot overlook the impact of EU accession in 2004. EU membership gave the national economy a strong development impulse. Between 2004 and 2007 the annual growth rate of GDP was about 6%. In 2008, GDP rose by 4.9%, thus a marked slowdown. 2009 witnessed a decline in GDP by 1.1% in the second quarter, resulting in an annual growth rate of about 1.7% by the end of the year. It is noted that other EU Member States suffered a much sharper decrease in GDP. In general, after EU accession Poland has reduced the distance to the EU average and somewhat narrowed the development gap.

*Table 1 Main macroeconomic indicators for Poland in 2004–2010 (%)*

| Year | 2004 | 2005 | 2006 | 2007 | 2008 | 2009* | 2010** |
|---|---|---|---|---|---|---|---|
| GDP growth rate | 5.3 | 3.6 | 6.2 | 6.7 | 4.9 | 1.7 | 2.7 |
| Unemployment rate | 19.0 | 17.6 | 14.8 | 11.2 | 9.5 | 11.2 | 13.9 |
| Inflation rate | 3.5 | 2.1 | 1.0 | 2.5 | 4.2 | 2.9 | 1.5 |
| Budget deficit | -5.2 | -4.3 | -3.9 | -1.9 | -3.9 | -6.6 | -6.3 |
| Current account balance | -1.1 | -1.2 | -2.7 | -4.7 | -5.5 | n.a. | n.a. |

** not final data;*
***estimates; Source: Author's estimates based on GUS and Eurostat data*

As concerns the demand-side sources of economic growth between 2004 and 2008, the most stable factor of domestic demand appears to have been private consumption, fuelling GDP growth even in periods of unfavourable developments in the external environment. Following EU accession, private consumption increased by an annual average of about 5%. This stemmed from the improving situation in the labour market and rising real wages. A marked slowdown in economic activity at the turn of 2008/2009 had an adverse effect on the positive trends observed in previous years. After accession to the UE Poland's economy benefited from EU transfers, mostly within the framework of the common agricultural policy and the cohesion policy. Taking into account payment of contribution to EU budget Poland received in 2009 6.5 billions of EUR that is 2 billions more than in 2008. From the moment of lunching development programmes for 2007 – 2013 till September 2010 over 147 thousands of application was submitted wit total amount of 86 billions of EUR. In the same time 42 thousands of projects were accepted equal to 49 billions of EUR of which 32,5 billions are from EU budget. The decline of domestic economy was therefore alleviated by the inflow of EU funds stimulating investment and by the depreciation of the Polish currency against the EUR.

## Polish agricultural holdings in the global financial crises

When assessing the consequences of the economic and financial crises for the food sector, it is noted that 2008 was most difficult for agriculture in recent years, while 2009 saw some improvement in the market conditions for agricultural production. This included an increase of purchase prices for agricultural raw materials (4.2% in December 2009, year on year) and a decline in retail prices for agricultural inputs (by an average of 3.5%) while retail prices for mineral fertilisers dropped by 20% in 2009. However, purchase prices increased only slightly faster that retail food prices which went up by an average of 3.6% between January and December 2009. As a result, in 2009 the cumulated agricultural price scissors index, expressing the ratio of change of farm inputs and outputs prices' prices, was above 108 (compared with December 2008), while in 2008 it was merely 77.4 (compared to the previous year). In the period 2004-2009 the realised farm income significantly varied between particular types of farming.

*Table 2 Family farm income per full-time worker by type of farming in 2004–2009 in EUR*

| Year | Type of farm | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Field crops | Horticultural crops | Permanent crops | Dairy cows | Grazing stock | Granivores | Mixed | Total * |
| 2004 | 3393 | 5296 | 3664 | 3755 | 1965 | 8406 | 2390 | 3205 |
| 2005 | 3145 | 6112 | 4613 | 4827 | 3237 | 8872 | 2622 | 3502 |
| 2006 | 4802 | 6744 | 6135 | 5504 | 4485 | 7401 | 3453 | 4390 |
| 2007 | 6210 | 7081 | 6932 | 6519 | 5912 | 8608 | 3372 | 4936 |
| 2008 | 4665 | 5613 | 3556 | 5325 | 3992 | 8525 | 3020 | 4042 |
| 2009 | 4399 | 4675 | 261 | 5545 | 5689 | 10842 | 3429 | 4343 |

*Source: calculations based on the Polish FADN data. 1 EUR = 4PLN*

The programmes of subsidies on current operations of agricultural holdings had a crucial effect on the level of farmers' income, particularly in the last years of the period in question. Whereas subsidies played a relatively minor role in 2004, in the last years of the period farm income was determined by subsidies rather than by current operations. According to the estimation account for 2009, in holdings representing three types of farming the subsidies received also allowed to compensate for losses on current operations realised at market prices.

*Table 3 Ratio of subsidies on current operations to family farm income per full-time worker by type of farming in 2004–2009 in %*

| Year | Type of farm | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Field crops | Horticultural crops | Permanent crops | Dairy cows | Grazing stock | Granivores | Mixed | Total * |
| 2004 | 21.7 | 0.9 | 6.5 | 11.9 | 16.4 | 4.2 | 14.9 | 13.5 |
| 2005 | 57.0 | 5.3 | 17.0 | 29.2 | 51.1 | 17.2 | 50.0 | 39.7 |
| 2006 | 56.0 | 8.7 | 19.4 | 40.5 | 54.3 | 30.2 | 58.2 | 48.3 |
| 2007 | 35.8 | 5.9 | 12.0 | 25.8 | 32.2 | 18.8 | 50.8 | 36.0 |
| 2008 | 68.6 | 8.3 | 28.3 | 43.7 | 75.3 | 28.4 | 81.0 | 62.9 |
| 2009 | 103.4 | 14.1 | 541.2 | 60.4 | 71.1 | 32.2 | 101.7 | 83.1 |

Source: [6], calculations based on the Polish FADN data.

The better market conditions for agricultural production observed in 2009 could not significantly improve the income situation of Polish farmers who still suffered the consequences of unfavourable price changes in 2008. The situation in agricultural and food markets encouraged purchasing and processing entities to shift the burden of the crises onto farmers. The deterioration of the financial standing of agricultural enterprises and holdings does not however imply a deep recession. The analysis of average enterprises results demonstrates that agriculture at large continues to enjoy sufficient creditworthiness.

The response to deteriorating market conditions differs between large agricultural holdings, with intensive production, and small farms, mainly oriented towards subsistence or semi-subsistence production, the latter for years characterised by limited replacement of productive assets. Commercial holdings are more exposed to adverse effects of economic downturns, but they benefit more from intervention measures undertaken at national or European Community level. Small farms in turn respond to deteriorating cost and price relations with increasingly extensive production. This further aggravates the prevalence of rural poverty and calls for additional methods and measures to deal with this problem.

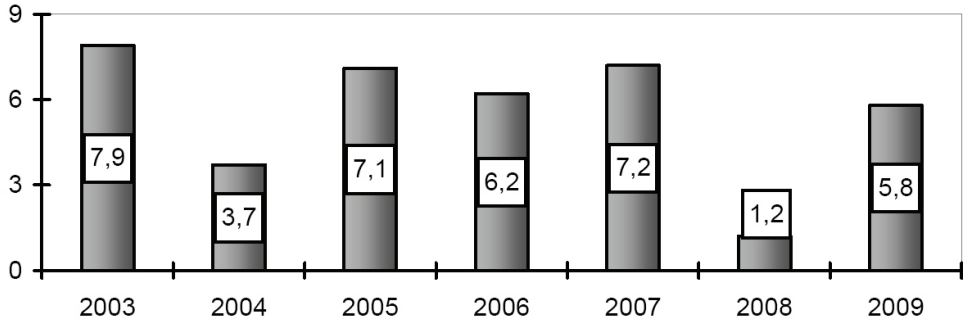
## Impact of the crises on agri-food sector and foreign trade

The production performance of the food industry in 2008, particularly in the second half of the year, and in the first half of 2009 clearly marks the end of the production growth triggered by Poland's accession to the European Union and clearly shows the impact of the global economic crisis, increasingly affecting the Polish economy. However, the food sector, catering for the basic needs of the population, has been hit by the crises to a lesser extent than other parts of the national economy. This is confirmed by the results for the second half of 2009, when it became apparent that the recorded decline in the marketed production of food products and beverages was only temporary (Urban, 2008). Nevertheless, the strong export orientation of Poland's agri-food sector could pose a major threat to growth in future. Since the largest buyers of Polish food products: Germany, the United Kingdom, Ukraine and Russia

are experiencing a recession, the negative effects were only mitigated by a strong depreciation of the Polish currency, in effect improving the profitability of exports and reducing the incentive for imports.

The analysis of annual growth rates of sold production in the food industry confirms the robust increase in 2003–2007 and a marked slowdown in output in 2008 (Figure 1). Throughout 2008, the value of sold production in the food industry at constant prices went up by a mere 1.2%. Crisis developments were not the sole reason for the deteriorated production performance in the food industry in 2008. It was also contributed to by an unusually deep trough in the pig meat cycle, the reform of the sugar market and a drop in sugar production as well as by problems encountered in the bio fuel sector. Those factors combined brought about a sharp output contraction in food processing in these sectors of the food economy. The first months of 2009 turned out to be surprisingly favourable for the Polish food industry. From January to November 2009, the value of the sold production of food products and beverages at constant prices increased by as much as 5.8% (on the corresponding period of the previous year).

*Figure 1. Growth rate of sold production of food products and beverages in %, constant prices*

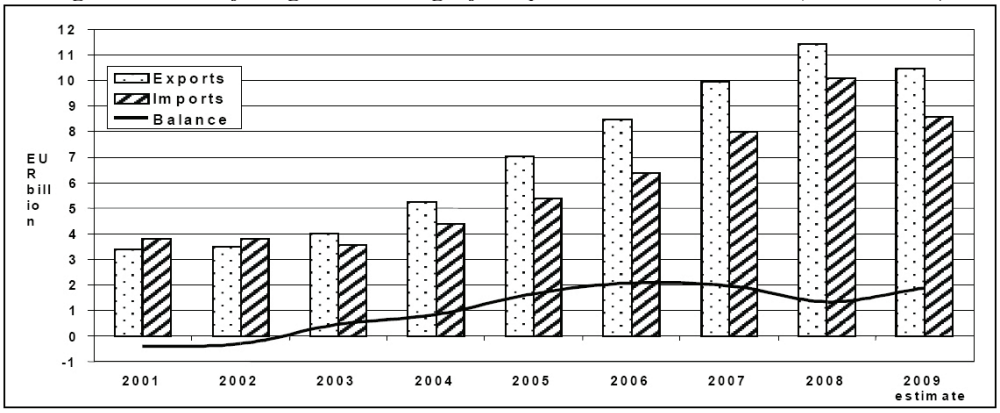



*Source: own study based on "Statistical Yearbooks", GUS, Warsaw 2004-2008, and "Statistical Bulletin", GUS no 11/2009.*

Foreign trade in agri-food products constitutes a vital component for the Polish agri-food sector (Figure 2). Accession to the EU resulted in rapid growth of this group of exports. In both export and import, until 2008 Poland was increasingly dependent on trade with other EU Member States. 2009 saw a reversal of previous trend of this foreign trade concentration. The crises first hit trade with the EU-15, both in terms of exports and imports. The shifts in the geographical composition of exports reflect that domestic exporters again started to diversify outlets. This is reflected in a decreasing share of economically developed countries, including the EU, and a rising proportion of the CIS countries (particularly Russia) and developing countries. In a situation of declining imports, developed economies diminish in importance as recipients of Polish products (e.g. EFTA), while developing countries play an increasingly important role. Such changes point to the search for cheaper sources of supply and a relatively greater

share of raw material products dominating in imports from developing countries. A sharper decline of imports compared to exports resulted in a higher export surplus. This positive effect is only temporary and observed in the economy as a whole, while for particular industries and economic operators it implies lower sales and income, which may eventually result in business bankruptcies.

*Figure 2. Polish foreign trade in agri-food products in 2001–2009 (EUR billion)*




*Source: own study based on "Statistical Yearbooks", GUS, Warsaw 2004-2008, and "Statistical Bulletin", GUS no 11/2009*

Shrinking demand has primarily affected exporters of processed products. The crises hit the most severely markets in processed products, i.e. more expensive, characterised by less rigid demand compared to basic food products or agricultural raw materials. Declining exports also stemmed from a decrease of export prices. Apart from the contracting demand and decline of prices in world markets, the appreciation of the Polish currency also had a downward effect on Poland's agri-food exports, although, at the same time, it contributed to lower prices for imported products. For this reason, Poland's price advantage in exports diminished even further. The conclusion is that the economic crisis undoubtedly had a negative impact on the competitiveness of Polish products in foreign markets.

## Final remarks and conclusions

The analysis of the impacts of the 2008 and 2009 economic and financial crises on the Polish economy leads to the unambiguous conclusion that the crises' root cause lies outside Poland rather than in the national economy. Furthermore, the effects of the crises have not been as strong as in the case of countries with closer links with the US economy and its banking and financial sector.

Nevertheless, the current global crises have had a greater impact on the agri-food sector in Poland compared to recent recessions as the basic functions of agriculture related to food production involve increasingly complex activities and factors and are dependent on conditions outside agriculture, rather than in agriculture as such.. The

situation in the Polish food sector as a whole was somewhat better than in other sections of the national economy.

The analysis of factors influencing GDP growth demonstrates that the economic growth model prevailing in Poland is based on classical production factors: labour, land and capital, as still few sectors of the economy rely on knowledge and skills as important factors of growth, in line the requirements of a knowledge-based economy. Higher rates of economic growth require investment, thus a labour-economising and investment-oriented distribution of national income. Investment and the programmes to reduce unemployment involve in turn limitations on real wages increase. The greater the rise in real wages, the more benefits enterprises derives from reduction of employment. Slower growth of unit labour costs in order to increase employment facilitates combating inflation and balancing the state budget through lower costs of the indexation of wages in the public sector and pensions.

The ability to create and constantly absorb innovation will be the greatest challenge to the Polish economy in the post-crises decade of the 21st century. The understanding of innovation has changed recently, to mean a complex of developments and processes creating new standards and production technologies (Szczepaniak, 2009). The problem of innovative thinking and acting has become particularly dramatic now that the Polish economy is open. An open space which is not innovative becomes a dependent space in economic and scientific terms.

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Economics of agriculture
SI – 2
UDK: 339.13 (497.11)

# CONCENTRATION - DETERMINATION OF THE RELEVANT MARKET - THEORY AND PRACTICE IN THE REPUBLIC OF SERBIA[1]

*Vlade Zarić, Zorica Vasiljević, Danijela Petković*[2]

## Summary

*Identifying of the concentration level on certain markets is a starting point in the analysis of market structures. This is also a prerequisite for subsequent decision making at the institutional level and estimating state policy effects on the market.*

*Concentration and its effects on competition are determined by taking into account the relevant products and relevant market. It is generally accepted that competition is desirable and that it has positive effects. Fair competition results in lower production costs and lower product prices, and stimulates innovation as well.*

*Analysis of concentration provides information about the intensity of competition. Despite the importance of concentration, in domestic literature these issues are not often found. One reason is the lack of complete institutional arrangements for this area.*

*This paper presents the theoretical principles of concentration determination and shows the practice in the Republic of Serbia.*

***Key words**: concentration, the relevant market, the Republic of Serbia,*

## Introduction

Concentration to a certain extent it is economically desirable as it contributes to the welfare of consumers in both the short and in the long run. The purpose of the existence of state regulation in this area is to provide a level of concentration and

1 This paper is the result of the research financed by the Ministry of Science and Technological development. The Republic of Serbia. Project number: TP20059 «Competitiveness improvement of products from small farmers trough making of trade marks an brands»

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competition that is most favourable to the consumer.

Trade of agricultural and food products in the Republic of Serbia have had a rapid growth after the changes in 2000. A change has occurred because of privatization, then the emergence of new local and foreign retail chains and the emergence of a large number of small retail stores.

Bearing in mind the importance of agri-food sector in the Republic of Serbia, analysis of concentration and its effects is of particular importance for the further development of competitiveness.

The paper analyzes the theoretical principles and definitions of the relevant product and relevant market, then the legislation in the Republic of Serbia in this area and its application in practice[3].

## Material and methods

For the analysis presented in this paper, firstly the desk research was applied, then consultations with experts in various fields, and finally, it has been analyzed the practice of determining the concentration in the Republic of Serbia.

## The importance of the relevant market determination for examination of concentration

Defining of relevant markets is important for assessing the concentration in the economy, for the assessment of market structure, as well as the assessing market power of individual entrepreneurs acting in the relevant market (Koester / Zaric, 2009.1).

To research the concentration is necessary to define the essential concept of the relevant market. In order to determine the relevant market at the first place it is necessary to

3 New phase in development of legislation and policies of protection of competition in Serbia started with adoption of the Law on Protection of Competition in September, 14, 2005 ("Official Gazette of RS", No. 79/2005), which is in force from September, 23, 2005. The Competition Commission has been established in April, 12, 2006 by election of the President and Vice President of The Commission Council. The latest Law on Protection of Competition ("Official Gazette of RS", No. 51/2009) is being in use since November, 01, 2009, and by this law jurisdiction and practical actions of The Commission are extended. The Commission is an independent body which has property of legal entity and works as a public authority in accordance with the law. The Commission reports to the Serbian Parliament about its work. The Commission is consisted of The Commission Council and Expert service Commission (Source: http://www.kzk.org.rs). At the end of 2010 a total of 30 persons were employed in the Commission, and by the judgement of the Commission President, for full use of institutional capacity 70 persons minimum is necessary ("Danas", September, 21, 2010).

define the product and its substitutes[4]. There are basically two approaches to determining the relevant market, namely from the standpoint of supply and from the demand side.

From the standpoint of supply of products and services possibilities of providing products substitutes are examined. In a certain area, the products are considered interchangeable if they have identical or very similar characteristics

However, from the production aspect, exchangeability of the product depends not only on the similarity of their features but also on the fact whether customers will recognize the products as substitutes.

From the standpoint of demand, namely customers who decide to purchase, the existence of mutually interchangeable products are studied. In the fact buyers determine the similarities and differences between products based on product characteristics, which can be observed from the purchasing decision.

Indicator of the intensity of substitution is the elasticity of supply and elasticity of demand. The elasticity could be measured in several ways, but in the EU the common practice is to use The Small but Significant Non-transitory Increase in Prices (SSNIP) test. This test measures the ability of changes in demand and it is also known as the hypothetical monopolist test[5].

In the case that changes the price of one product affect demand for other products, these products are substitutes. In this way the limits of the relevant markets are a certain area in which customers respond. Thus defined, the market supply and market demand is a key element in determining the concentration of individual markets and in describing the intensity of competition.

The concentration can be considered as desirable as long as it has positive effects on competition. Indicators of market concentration are often used to describe the intensity of competition, which shows that there are close links between these two indicators. However, some research shows that it is not always possible indicators of the concentration used as a valid means to explain the competition.

A commonly accepted measure of market concentration is the Herfindahl-Hirschman Index (HHI)[6] and by using this indicator in some countries there is a high

4 This area was treated by the consumer's behaviour theory. More specific, see Kotler, P. (1999): Marketing management – Analysis, Planning, Implementation & Control, 9th Edition. Informator. Zagreb.

5 The Small but Significant Non-transitory Increase in Prices (SSNIP) test was introduced with the 1982 U. S. Merger Guidelines and is widely used by competition authors to define the relevant market (Doljord, Ø. / Sørgad, L. / Thomassen, Ø. (2007). The SSNIP-test in EU was used for the first time in 1992 in topic M.190 Nestlé/Perrier OJ 1992 L356/1. Starting with 1997 this became an official method of measuring impact on prices in EU, because the Commission used the stated definition in its notification about identification of the relevant market (Commission Notice on the definition of the relevant market for the purposes of Community competition law, (1997), OJ C372/5). According to the SSNIP-test "Hypothetically small (from 5% to 10%) but permanent increase of prices criteria is in use.

6 Bikker, J. A. (2004): Competition and efficiency in the Unified European Banking Market. Edward Elgar, USA.

concentration. However, if in the same situation different methodological approaches were applied, such as model "Panzar & Ross"[7], it comes to the conclusion that a low level of concentration and intensive competition is in place. In addition, neither of these two methodological approaches can provide an answer on the strength of individual market participants.

According to the "structure-conduct-performance[8]" model higher concentration means as a rule the greater market power that leads to distortion of competition. However, in cases where there are low barriers to entering the industry, a large proportion of an enterprise is not a great market power. For the intensity of competition there are important barriers in entering and exiting, and the amount of profits and risks related to a particular activity[9].

In contrast to the structure-conduct-performance model, the theory of efficient structures contains the main hypothesis that market concentration does not lead to the distortion of competition. According to this theory an efficient entrepreneurs can choose between two strategies. The first strategy would mean maintaining price and market share at the same level. More efficient production would increase value for shareholders. Another strategy would mean a reduction in prices, increase market share and therefore increase profits. Apart from increasing efficiency, high concentration may prevent the bankruptcy of the entrepreneur, although it has adverse effect on competition.

## Determination of the relevant market in the Republic of Serbia

Rules for defining the relevant market in the laws of the Republic of Serbia are mostly aligned with the EU[10] *acquis communautaire*. Relevant market is considered the

7 Panzar, J. I. & Rosse, J. N. (1987): Testing for Monopoly Equilibrium. The Journal of Industrial Economics. Vol. 35. No. 4. str. 443-456

8 Bain, J. S. (1956): Barriers to New Competition. Harvard Univesity Press.

9 Porter, M. E. (1993): Wettbewerbsstrategie (Competitive Strategy). 7. Auflage. Campus. Frankfurt.

10 Agreement on Stabilization and Association (ASA) is an international agreement, which has been signed in April, 29, 2008 between Republic of Serbia and European Union. According to this Agreement the Republic of Serbia committed to establish the free trade zone and harmonize the legislation with Acquis Communitare. Considering the large number of EU regulations, priority areas which have direct impact on creation of the free trade zone between EU and Serbia have been selected: protection of competitiveness and control of allocation of state aid, intellectual property legislation, procurement, standardization and consumers protection (see: EU Integration Office of The Republic of Serbia). Competition Protection Law complies with primary and secondary EU legislation in competition protection area. "Applying the Law and regulations adopted, and those waiting for adoption, provisions specified in articles 81 and 82 of Treaty of establishing the European Community and provisions of article code 73 of Agreement on Stabilization an Association" (Annual report of The EU Integration Office for 2009).

market of goods and/or services in specific geographical areas[11].

The relevant market includes the supply of goods and/or services which consumers and other users consider as substitute[12]. The geographic market is defined as market on which the firms produce or sell. This market has the same or similar conditions of competition, which is essentially different from the conditions of competition in neighbouring geographic markets. A single firm may operate in a number of different geographic markets.

Criteria for determining the relevant market are explained in the Regulation ("Official Gazette of RS", No. 89/2009)[13]. The relevant product market and relevant geographic market should be defined for each specific case. It is important to point out that institutions dealing with the protection of competition tend to define the relevant market on a more narrow way, whereas market participants tend to use a broader definition. It is clear that the concentration level depends on of the relevant market definition (Zaric, 2008.2)[14].

In the case that the representative market is assumed as a small geographical area, for example Sumadija in Serbia, it will be easier to prove the existence of negative effects of competition, than in the case when the representative market is seen the market of the Republic of Serbia or the CEFTA market.

According to the law, if there is a merger of market player, they are obliged to report in the case that they together exceeds the minimum amount of total income that has been made in the preceding year. There is a distinction in turnover on the world market, at least 100 million €, and in the Republic of Serbia at least € 10 million if there is one participant, or € 20 million if there are two of them. In this way the Commission can devote more attention to assess the concentration of the major effects

11 The article code 6. (The Law on Protection of Competition, "Official Gazette of RS" No. 51/2009).

12 Substations of products and/or services are related to properties, common purpose, and prices.

13 See, articles 3, 4 and 5 of the Regulation on Criteria for Determination of Relevant Market ("Official Gazette of RS", No.89/2009).

14 In the opinion of the Competition Commission on the Belgrade market there is a dominant position of one company "Delta" by 63% share of retail market. Hence the Belgrade market is the most dynamic in Serbia, dominant position offers significant benefits (Ekonomski Magazin, No 399, January 14th 2008, p. 20). However, Statistical Office of The Republic of Serbia found that market share of "Delta Maksi" during the first half of 2007 on the Serbian market was 6.4% and on the Belgrade market was 11.6%. This result was found on the basis of the regular quarterly survey on retail trade. If we ignore other possible reasons for different results, here is obviously a different definition of relevant market. Suppose that Statistical Office is not an interested party, hence it is a state institution which has its own methodological approaches. In later discussions on this matter it has been shown that the "Delta" officials, as interested parties, want to impose the wider definition of relevant market (Zarić, V. (2008): Analysis of competitiveness of agricultural and food products in Serbia. Publisher: Faculty of Agriculture, University of Belgrade).

on competition as well as processes and procedures that lead to serious violations of competition. Increasing the quality of analysis will contribute to the sector analysis that the Commission may obtain.

In the event that the relevant market is narrowly defined and do not take into account all the substitutes, or if the geographical area defined narrowly, it would be that market participants have unrealistically high shares. This will lead to a restrictive attitude and policy towards concentration and at the same time weak competitive capacity with respect to suppliers from other areas.

The practice of the Competition Commission shows quite a cautious approach and a narrow interpretation of the relevant market. This attitude can be interpreted as the need for the Commission to explain all aspects of the negative effects of concentration on competition as precisely as possible.

In order to assess the relevant market and the concentration of entrepreneurs Commission for Protection of Competition have to collect data, before starting the analysis. According to the law, parties involved in the concentration are required to submit data to the Commission. In addition, under Regulation Commission makes estimates based on "all available data". The Regulation sets out what types of data on which estimates are made, but does not specify the data sources[15].

According to the Law, in order to obtain information, Commission has the ability to down raid market participants and to look at the material that it deems relevant to the study of concentration and decision making.

In addition, state authorities are obliged after Commission request, to provide information, documents or other material. Despite this broadly defined notion of sources in practice it happens that the Commission does not have comprehensive information for analysis.

The legislator was mindful of difficulty of finding valid data. In the process of initiation of ex officio predicted that conclusion by the Commission should contain statement "... and an invitation to all persons who have information, documents or other relevant information, to submit them to the Commission." This confirms the difficulty in obtaining valid information[16]. Getting information on time is one of the important conditions for the Commission work, because Commission is obliged to make decisions within limited period.

According to the law, a violation of competition is considered when there is a significant restriction, prevention or distortion of competition[17], through restrictive agreements[18] and abuse of dominant position[19]. Dominant position is defined by market

15 In the article 3 and 4 of Regulation stand's "all available", but in the article 5 data coverage extends to states " ... and other available data, ..."

16 See for example the cases of Frikom s.c.; Idea ltd and Grand prom s.c..; Idea s.c. and Swisslion group ltd.

17 Article code 9 "Law on Protection of Competition"

18 Article code 10 "Law on Protection of Competition"

19 Article code 16."Law on Protection of Competition"

share at least 40% by one competitor, or 50% and more if there are two or more competitors[20].

In the opinion of the President of the Commission the food sector in the Republic Serbia has the characteristic of a cartel that dictates the price to wholesale and retail. Due to the fact of market power of existing companies in the whole sale and retail marketing chains, they are able to keep high margins. This is because of existing barriers to entry into Serbian wholesale and retail market. The main problem for the new competitor in Serbian trade market is to find an appropriate location (Danas, 21st September 2010) [21].

The Commission noted the abuse of dominant position in the case of Frikom. In this case the relevant market was defined as following: "market production and sale of ice cream and market production and sale of frozen food." Misuse of market power is defined in relation to the manner of granting discount to customers. Namely, in relation to the types of discount, the procedure and method of calculation as well as conditions of payment for using discount (Frikom Case).

In the case of trade with agricultural and food products Commission concluded that there are restrictive agreements in the vertical chain. There are agreements to determine the lowest retail price as fixed or minimum price in further trade with commodities.

In one case discount per invoice was promised if recommended commodity price were applied (the case of Idea/Grand Prom) and in the second contract discount was connected with a specific formula for calculating the retail price for different formats of customers (the case of Idea/Swisslion).

The Commission concluded that there is a restrictive agreement as the parties foresee the exchange of confidential business data with an allowance equivalent to 1% of the value of invoice. The payment would be done on the monthly level (the case of Metro/Delta).

In these cases where there are restrictive agreements Commission did not specified the relevant market but one can assume that this could be a production and marketing program listed companies.

## Conclusion

The basis for the concentration analysis is to define the relevant market in terms

20 Article code 15."Law on Protection of Competition"

21 Daily newspaper "Danas" of September, 21, 2010 published "The most violations of competitiveness rules are in food industry and retail chains" (www.danas.rs). In Commission President's opinion, in the Republic of Serbia the state contributed the most to creation of conditions for violations of competitiveness and existence of cartels and monopolies. Structures mentioned above have been established trough the privatisation process, when there was the planned economy that provided positions. Today's cartels and monopolies in Republic of Serbia are not made on the basis of competition, application of innovation and high efficiency.

of defining the product and its substitutes and in terms of geographical coverage. The relevant market can be determined from the demand and supply points. It is essentially important to determine the intensity of substitution and elasticity. There are several models used to determine the exchangeability of products. In practice, the EU is mostly used SSNIP test. In addition to knowing the structure it is important to know the power of the individual competitor as well as barriers to entry and barriers to exit from certain sectors.

Determination of the relevant market in the Republic of Serbia is in line with the rules and procedures applied in the EU. Tendency of the Commission is to define narrower markets does not lead inevitably to the conclusions which could be unfavourable for competition development.

The Commission has rather careful methods of work and this should be interpreted as a need to avoid adverse effects.

Although the Commission has broad authority for obtaining information, the current situation in Serbia may make it considerable difficult. For further development of competition it is necessary to strengthen Commission capacity and to increase cooperation with institutions dealing with issues of competition.

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# *Urban and peri urban agriculture*

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## Urban and peri urban agriculture


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Economics of agriculture
SI – 2
UDK: 631/635:504.05

# MODEL OF COOPERATIVES' CONTRIBUTION TO THE SUSTAINABLE AND RURAL DEVELOPMENT

*Jasmina Arsenijević[1], Marija M. Nikolić[2]*

## Abstract

*In this paper is presented the model of support to rural and sustainable development based on expanding role of agricultural cooperatives on education, promotion and support through straightening multifunctional agriculture. Idea is that agricultural cooperatives that already have some educational role activate in informal education of rural population, straightening their awareness of sustainable development problems and their role in preventing and direct blocking of environment pollution in work and life in villages. Beside promotion of pure technologies, organic production, use of alternative source of energy or waste recycling; rural population would be introduced to new developing possibilities of village tourism, national handicraft industry, folklore and other rural potentials thorough different models of informal education.*
***Key words:*** *cooperatives, sustainable development, rural development, multifunctional agriculture.*

## The need of sustainable and rural development and multifunctional agriculture

Industrialized agriculture significantly contributes to the pollution and exploitation of natural resources: contemporary agro technology usage results water pollution, soil salinity and erosion, carbon dioxide emission and destroying living organisms from soil. It practically causes instability of the whole flora and fauna.

Idea of sustainable development is of great significance for all countries, regardless of level of development. Developed countries are facing problems of industrial pollution and high concentration of population in urban areas while employment in rural areas is reduced due to high automation of agriculture. Developing countries are facing

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unemployment, processes of senility and feminization in villages, weaken agriculture and threat (and often reality) that dirty technologies are only available instrument of industrial development.

Sustainable development (SD) solves many problems that excessive industrialization causes to the ecosystem. According to the World Commission on Environment and Development definition, which is the most cited definition, SD is 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'. It actually means the review of sustainability of all product life cycle phases: production, distribution, consumption and disposal. It embraces complementary movements as organic agriculture, rural development and multifunctional agriculture. The new movements, in accordance with mentioned, are emerging: *fair trade* and *eco chic*. Organic agriculture means food production through soil exploitation without its erosion and reduction its productivity, and therefore harming future generation. These movements are supported in Europe, thereby according to the Agri-Environmental programmes implemented under European Council Regulation, the agro production in concordance with defined interests is co-financed.

Rural development, emerging social cohesion, environmental protection, employment and market liberalization, has been set out among the most significant EU priorities. The Treaty of Maastricht ratified in 1993 emphasize that the rural development policy tasks are to enable farmers to stay in rural areas, participate in municipality development through job diversification and ensure rural environment preservation.

Multifunctional agriculture creates environment for stabilisation or increase of rural employment, comprehending and complementary functions of agriculture, therefore it is also called integral rural development. These occurrences appear as answer on unemployment and marginalisation of rural areas. In industrially developed countries, urban areas have concentrated number of inhabitants that migrated from rural areas through industrialisation. Increasing level of automation in agriculture imply reducing number of workers in agriculture. Uneven population, employment and consequently development create the need for rural development.

The human society overcomes industrial era along with the business paradigm shift and science and technology development (as Alvin Toffler calls it "The Third Wave"), while agriculture is losing the role of guarantor of social stability and the pillar of economic potential. Non agricultural activities have been more and more addressed as the source of income in rural areas. Even the formal European politics have recognized the importance of so-called „part time farming". In order to solve problems like environment pollution and extreme exploitation of natural resources, but also problems of unemployment and unequal population density – countries are turning to rural development and multifunctional agriculture more often.

Developing countries are even more perspective for implementation of integrated rural development. Industrial development is not strong enough to amortize unemployment in economy. Serbia, as less developed transitional country, with weaken industry and fruitful agriculture tradition and potentials, is facing problems like all other countries on Western Balkan. With uneducated and uninformed rural inhabitants, high number of very small fields, small number of specialized agricultural producers and

high percent of farms with incomes from different industries, it represents favourable base for implementation of rural development and multifunctional agriculture. Finally, concrete actions as the necessary precondition for entering EU for the countries like Serbia are emerging, primarily with the aim of compliance with the coherent strategy of rural development for whole Europe. National strategies have to be based on mutual strategic guidelines[3].

Considering the fact that the number of population in rural areas in Serbia is around 43 percent, while in Croatia is around 48, in Romania 47, Bulgaria 31, and on European level around 56 percent, we can observe that suggested model could significantly contribute solving problems of environmental pollution not only in developing countries like Serbia and its neighbour countries, but also in developed countries; and furthermore become strong cultural and social foundations of sustainability.

## European Agriculture policy and sustainable development

With over 56% of the population living in rural areas which cover 91% of the territory, rural development is extremely important for EU. In agricultural sector, EU strives for economic growth, technological development and employment enhancement in a sustainable way. Multifunctional agriculture is often regarded as a *European model of agriculture*, since it was appointed as the initiator and connective tissue of the rural economy by creators of Common Agricultural Policy (CAP). Politics of rural development in period 2007-2013 is focused on the improving the *competitiveness of agriculture and forestry; improving the environment and the countryside and improving the quality of life in rural areas and encouraging diversification of economic activity* (European Commission, 2007, page 1). Within this politics there is the LEADER (franc. Liason Entre Actions pour le Development d'lEconomie Rurale) rural development program for strengthening economic and social prosperity of rural areas through locally driven rural development initiatives and projects.

In Serbia, however, although is composed the rural development strategy plan (MPŠV, 2009), there is no concordance in rural development regulation with European one. Many strategic documents were set in, but problems have not been recognized nor are being solved, there is no systemic coordination of relevant institutions or state aid focusing.

## The definition and the role of cooperatives in rural development

Agriculture cooperatives represent centres of farmers where they join their potentials in order to mutually and under better conditions enter the market of agricultural products. They are powerful mean of enhancing social power of rural areas

3 Council Decision No. 2006/144 EC on Community strategic guidelines for rural development, for programming period 2007 to 2013.

even in the most developed countries. Cooperative movement in USA receive a boost and in 2002 comprehend over 3 thousand cooperatives with annual turnover of over 110 billion dollars. In Europe in 1999 there were 30 thousand agricultural cooperatives with almost 9 million of members. Sorensen (2000, page 10) emphasize that agricultural cooperatives have great influence on development of rural areas through *efficient spread of innovation and easier access to financial resources*.

Cooperatives not only to increase stability and competitiveness of farms, they also represent leverage of technological development through increase of innovation. Cooperatives have an educational role, but in less developed countries only the best ones participate in education process. Therefore, this paper pleads that those cooperatives that already have capacities and predispositions expand and intensify on educational, cohesion, incubation and development roles in developing and developed countries.

## Support of sustainable development through increased activities of cooperatives

Beside cooperatives that might have perspective role in development of rural areas, in Serbia there are also *regional centres* (15 of them) that create rural development network (RDN), *local governments* (with offices for helping villages) and *extension services*. RDN are facing problems such as lack of financial, technical and human resources and weak communication with local government as well as within network. Most of local government in Serbia haven't adopted strategic plans for sustainable and rural development, and offices for helping village are characterised with lack of initiative, knowledge and ideas (Hopić, 2008, page 29). Extension services are poorly developed due to lack of capacity, and lack of demand.

Since underdevelopment of rural areas is a big problem, individual efforts are not enough, particularly in Serbia and other Western Balkan countries. It is necessary to work parallel on more tracks. Single participants and institutions can contribute to prevention and solving problems, despite great significance of systemic approach. Author in this paper suggests expanding functions of cooperatives that already provide business support and education of farmers and rural inhabitants, so that they could provide additional information on sustainable development and increase level of consciousness of rural inhabitants.

Agricultural cooperatives that have extended network in Serbia can become flywheel of rural development. Target group is rural population. Cooperatives are facing challenges to educate not only their members, but population in local community, about new technologies, environmental protection, and especially about sustainable development. Cooperatives will have the role to inform, train and support rural population to engage in multifunctional sustainable agriculture and encourage economic development. This will result in expanding the role of cooperatives on education and incubation. Author suggests that cooperatives expand on following:

1. Foundation of evening schools, courses and workshops. Maintain and improve of cooperatives' business in organising specialised evening schools particularly for farmers

and rural youth.

2. Foundation of magazines for publishing information on work of cooperative, materials for education, news regarding finished and open projects, world trends and rural and sustainable development etc.

3. Foundation and updating of Internet portal with similar contents as in magazine with link to information systems of cooperative.

4. Foundation and work of call centre for providing information and advices.

5. Organising seminars, lectures and meetings on rural and sustainable development (to improve consciousness on need to protect environment and business potentials in multifunctional agriculture).

6. Organising study tours of farmers, lecturers and consultants for dissemination of knowledge and ideas.

7. Close cooperation with local educational institution, groups, institutes and universities, though exchange of information and knowledge, organising mutual actions and lectures.

8. Providing incubation support services for new projects and companies (bureaucratic, infrastructural, financial and professional support).

9. Foundation of informatics system with joint and organised data for cooperative members (regarding providers of agricultural inputs; recommended fertilisers; services of agricultural machinery; structure, sort and quality of land; weather forecast; available agricultural expert; providers of alternative energetic systems; activities and projects of competent ministry; farm structure and other statistical data).

In the first stage of this process, agricultural cooperatives would have support from government, but after achieving higher level of rural development in local surroundings they would become stronger for independent implementation of listed activities. Most of these activities are profitable (organising schools and seminars, study tours, extension service and selling of magazines). Some of these and similar activities are already conducted by different organisations in the world. The most interested are singled out.

Rural EcoCentre called ZIARNO in Poland organizes courses, projects and study visits in the field of organic agriculture, publishes it newspaper and have founded the cooperative which sells organic food and promote traditions of the region. Ziarno organizes special courses for farmers, youth and women (http://www.ziarno.eu/).

Ecolibri-Bionet is non-profitable organization, runs projects of environmental protection and sustainable socio-economic development of municipality in Serbia. The most interesting are following projects: educational workshops for farmers, students and pupils, under the name of *The best agricultural practice* throughout Serbia; *Return of the inhabitants to the villages of the Mountain Stara planina through traditional economy*, in 1999, and *Multiethnic education on natural resources conservation and sustainable natural resources use of the Mountain Sar planina*, in 1998; educational caravan *Djerdap without waste*, 2005, which had educational character for the representatives of local autonomy and teachers of primary schools concerning waste management in the

municipalities in Serbia (http://www.ecolibribionet.co.rs/index.html).

In Denmark is planed the development of environmentally-friendly heating technology based on producing briquettes from crop residues, especially maize straw and dried fibre extracted from manure. The support for knowledge diffusion through networking between farmers and researchers is planned in Netherlands. The network will operate through the internet, meetings and different publications (European Commission, 2008: 12).

## Conclusion

Simply educating citizenry to higher levels is not sufficient for creating sustainable society; it is more important to create a society that favours ecological values such as green production, recycling and renewable energy. Education for sustainability (ESD) means educational system which will reorient curriculum to address sustainable production and consumption patterns, especially secondary and tertiary education that will prepare new generations for institutionalizing green technology. ESD is a long-term process which will give results in the case of joining formal, unformal and informal education. Formal education is significant, but asks for high investments and gives long term results. Unformal and informal education is of great importance for short term results, not only in increasing the consciousness of inhabitants and change of behaviour for sustainable development, but also for concrete steps necessary for preventing further endangerment in agricultural sector. Alarming data on global pollution indicate that urgent measures are needed, such as informal education and other activities that have short term results. In this paper is presented an idea of expanding functions of agricultural cooperatives dominantly on unformal and informal education. Education would refer to topics perspective for rural areas: rural, eco and ethno tourism, healthy food, home conservation of energy, organic agriculture, agricultural products with geographic marks, processing and sale of agricultural and organic products, preserving and potentials of national handicraft, tradition, folklore, manufacture and traditional crafts, use of alternative source of energy for life and work in villages (windmills on farms and arable land, biomass energy, sun panels, recycling and compost, processing of septic material) and new agricultural strategies and technologies. Cooperatives would in such manner expand their functions on **educational, cohesion, incubation and development** role.

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Economics of agriculture
SI – 2
UDK: 638.163

# HONEY PRODUCTION AND ITS EXTERNALITY EFFECTS

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## Abstract

*Bee-keeping and honey production has a long history in Hungary. The honey production has important role in rural life. It is confirmed by researchers' studies that plant pollination by honey bees has significant positive external impacts on potential yields in orchards.*

*Although the contribution of honey production to the GDP in Hungary is only a few per cent, other benefits play a more important role.*

*This paper focuses on secondary research methods, gathering and evaluating figures regarding the positive external impacts of plant pollination by honey bees as well as finding possible solution for the problem that bee-keepers have a lot of costs in connection with carrying honey bees to orchards, while farmers "only" benefit from the positive externality of plant pollination in their fields. To evaluate its economic effects a numerical HEEM-model was developed and applied for the Hungarian situation. The financial outcome of the bee-keeping sector contributes considerably to the rural development in Hungary.*

***Keywords:*** *bee-keeping, external impacts, economic effects, honey*

## Introduction

Honey is one of the most important foods of our modern world taking into account the current trend in food consumption. In addition to it, honey has an important role in the so-called "healthy lifestyle", since it can be consumed without any further processing. While honey has been used for thousands of years to treat wounds and

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ailments, scientists have only recently begun to explain the precise effects of the natural sweetener's antiseptic and antibacterial qualities on human health (HELLER, 2008).

Worldwide production of honey amounts to around 1.4 million tonnes. The EU is an important producer of honey, in terms of production volume. In 2006, the EU production of honey amounted to almost 200 thousand tonnes, accounting for approximately 14% of the global production. Other leading producers according to their production shares are China (22%), the USA (6%), Argentina (6%) and Turkey (5%) (FAOSTAT, 2010).

Nowadays bee-keeping - as one of the activities can provide alternative income for small businesses in rural areas – has become more and more important topic in Hungary and in several part of the world. It takes important role in the preservation of rural landscape, traditions and their regional values. Rural development has become more and more important issue in Hungary since rural areas also contribute to the efficiency of the national economy. Development of rural areas also very important issue in the European Union, which could contribute to the improvement of profitability of small family businesses, lower unemployment rate in rural areas as well as slow down the migration of people from rural into urban areas. Nowadays bee-keeping sector provides income roughly 15 thousands families in Hungary. Hungary is one of the largest EU producers of natural honey, with production amounting to 19.7 thousand tonnes in 2006.

The contribution of honey production to the GDP in Hungary is only 1 per cent and to the animal husbandry is approximately 3 per cent. Bee-keeping has incontestable role in plant pollination, too, hereby gives positive externality to plant production sector. In addition, it contributes to the biodiversity of the nature directly. Classic microeconomic example of positive externality is the contact between the apiary and the neighbouring orchard (KOPÁNYI, 1993).

## Research Method

The main objective of this paper to show the relevant literature that contributes to the benefits and effects of pollination by insects with special regard to honey bees.

Secondary research methods were used for data gathering and evaluation, as the most internationally accepted one. Within the framework of the secondary research the restructuring and evaluation of the available data have been carried out.

For estimating the positive external impact, a model (HEEM - Honey-bee Economic Evaluation Model) has been created for evaluating different development scenarios. For creation of the numerical model (expressed in EUR) the method suggested by ZIMÁNYI (2006) was taken into account.

# Evaluation Of The Most Important Literature Regarding To The Benefits Of The Pollination By Honey-Bees

## *The Global perspectives*

The agronomic and economic value of honey-bee effected pollination has been an internationally contentious issue since at least the turn of the century (GILL, 1991). Unfortunately the recognition of the value of honeybees as pollinating agents has not always been unanimous. While the technical literature pertaining to the pollination of cultivated plants is relatively big and well-founded, the economic and social valuation of the pollination benefit is not well-developed.

Ecosystem services, defined as the benefits to human welfare provided by organisms interacting in ecosystems, are considered to be at risk (DAILY, 1997; PALMER et al, 2004). Pollination by wild animals and honey-bees is a key ecosystem service. Insect pollination is an ecosystem service with high economic value that is mainly provided by bees.

Honey-bees, mainly the Apis mellifera, remain the most economically valuable pollinators of crop monocultures worldwide (McGREGOR, 1976), and yields of some fruit, seed and nut crops would decrease by more than 90 % without these pollinators (SOUTHWICK and SOUTHWICK, 1992). When wild bees do not visit agricultural fields, managed honey-bee hives are often the solution for farmers to ensure crop pollination.

An economic evaluation of the contribution of bee pollination to the production of 30 insect-pollinated crops was published more than two decades ago (BORNECK and BRICOUT 1989). These authors attributed to each crop a value called: 'the coefficient of incidence', based on its dependence on insect pollination and attributed 85% of insect pollination to honey-bees. They calculated that the crops had a combined annual market value of 65000 million Ecus, that insect pollination contributed 5000 million Ecus and that pollination by honey-bees contributed about 4250 million Ecus (1 ecu = *ca.* 1$). There is a need to update this evaluation and include more than 30 of the 177 crops grown in the EU that benefit from bee pollination. More recently, the value of honey-bees and bumble-bees as pollinators of major selected UK crops for which market statistics are available, has been estimated to be £172 million for outdoor crops (rape, beans, tree and soft fruit) and £30 million for greenhouse crops (tomatoes and sweet peppers) (CARRECK and WILLIAMS, 1998).

KEVAN et al. (1990) stated that underestimation of the pivotal role played by managed and native insect pollinators is a key constraint to the sustainability of contemporary agricultural practices. The economic value of such insects to pollination, seed set, and fruit formation greatly outweighs that suggested by more conventional indices, such as the value of honey and wax produced by honey-bees.

ALLSOPP et al. (2008) presented in their study a replacement cost as a more accurate value estimator of insect pollination as an ecosystem service. In their opinion the importance of insect pollination to agriculture is unequivocal. Insect pollination is not only a critical ecosystem function, but also an essential input in the production of a host of agricultural crops grown

world-wide. Of the approximately 300 commercial crops (RICHARDS, 1993) about 84% are insect pollinated ones (WILLIAMS, 1996). Modern commercial crop production is increasingly dependent on managed pollinators (e.g. the introduction of honey-bee colonies into orchards or fields to improve crop production), and less on wild insects living on the periphery of crop fields (RICHARDS, 2001).

The "value" of managed honey-bee pollination has been used to justify honey price support schemes (ROBINSON et al, 1989); funding for honey-bee research and extension programmes (RICHARDS, 1993; COOK et al., 2007); invasive weeds as necessary bee forage (GILL et al., 1985; ALLSOPP et al., 2004); and for the preservation of indigenous vegetation (TURPIE et al., 2003). In turn the "value" of the wild pollination services (pollination ecosystem service) forms part of a case for the conservation of natural biodiversity.

We take a different approach to valuation by estimating industry-wide replacement costs for wild and managed insect pollination services (Table 1). We adopt an approach where the value of wild and managed insect pollination services are equivalent to the amount of income lost if these components were to be replaced by alternative (non-insect) means of pollination. Consequently, the replacement cost is proposed as an estimate of the relative value of these services.

*Table 1 - Current approach to calculate pollination service value*

| Approach | Formula to calculate "Pollination service value" | Reference |
|---|---|---|
| 1. Total production value | Annual production value | n/a. |
| 2. Proportion of total production value attributed to insect pollination | Annual production x insect dependence factor | MORSE et al., 2000; LOSEY et al., 2006. |
| 3. Replacement value | (Annual production attributed to insect pollination) – (Annual production value using pollinator replacement) | ALLSOPP, 2008 |

*Source: ALLSOPP, 2008.*

French scientists from INRA and the CNRS, found that the worldwide economic value of the pollination service provided by insect pollinators, mainly bees, was €153 billion in 2005 for the main crops. In terms of weight, 35% of the world food production comes from crops which depend on insect pollination, 60% come from crops which do not (such as cereals) and 5% come from crops on which the impact of insect pollination is still unknown. The total economic value of pollination worldwide represented 9.5% of the value of the world agricultural production used for human food in that year.

The scientists also found that the average value of crops that depend on insect pollinators for their production was on average much higher than that of the crops not pollinated by insects, such as cereals or sugar cane (€760 and €150 per metric ton, respectively). The vulnerability ratio was defined as the ratio of the economic value of insect pollination divided by the total crop production value. This ratio varied considerably among crop categories with

a maximum of 39% for stimulants (coffee and cocoa), 31% for nuts and 23% for fruits. There was a positive correlation between the value of a crop category per production unit and its ratio of vulnerability; the higher the dependence on insect pollinators, the higher the price per metric ton (KLEIN et al., 2006).

Their results highlighted that the complete loss of insect pollinators, particularly that of honey bees and wild bees which are the main crop pollinators, would not lead to the catastrophic disappearance of agriculture throughout the world, but would nevertheless result in substantial economic losses even though these figures take into consideration only the crops which are directly used for human food.

According to the study of the European Committee on the Status of Pollinators in North America, honey-bees is the most widely, carefully monitored, and commercially distributed pollinator, are used for the fruit and seed production of more than 100 crops in the United States. Estimates of their economic value in the United States range from $150 milllion (at 2007, the total annual cost of bee-colony rental) to almost $19 billion (the estimated value that farmers would pay if pollinators weren't freely available in nature) (MAZER, 2007).

### *The European Perspective*

Although the European Commission recognises the need for more environmentally-friendly agricultural policies, it does not appear to appreciate the crucial role of pollinator diversity to the functioning of agricultural production systems to ensure continuity of supply of high quality and varied food for Europe or the dangers of over-dependence on the services of a single pollinator, the honey-bee.

Crop production in Europe is highly dependent on pollination by insects. At least 264 crop species from 60 plant families are grown in the EU, nothing has been published about the pollination requirements of a third of these species but of the remainder, 84 % depend on, or benefit from, insect pollination (WILLIAMS, 1994).

The botanical diversity of morphology, degree of self-compatibility and sexuality of the flowers of crops grown requires a diversity of insect vectors for efficient pollination (WILLIAMS, 1994). The flowers of most outdoor crops are visited by an assemblage of insects, typically including the honey-bee, several species of bumble-bee, a few species of solitary-bee, and on more open flowers species of flies, beetles, butterflies, or thrips.

The native European honey-bee (*Apis mellifera*) is undoubtedly the insect species that contributes most to crop pollination (WILLIAMS, 1994). It is abundant and readily available; in the EU there are estimated to be about 7.5 million colonies managed by about 500000 beekeepers. It is the only pollinator available for supplementary pollination of field crops.

After reviewing the relevant literature, our paper focuses on the model, created by the authors. The **HEEM -** Honey-bee Economic Evaluation Model, as a possible solution for evaluating the positive external impact of honey-bee pollination is discussed below.

The main structure of the HEEM (Honey-bee Economic Evaluation Model) is seen below:

*Table 2 - Basic structure of the HEEM-model*

| TCCHP=CCCP+CCHK+SSCC+OC | | EUR | % |
|---|---|---|---|
| **TCCHP** | Total Cash Contribution of Honey-bee Pollination | 59.724.735 | 100 |
| **CCCP1** | Cash Contribution for Crop Producer | 14.880.000 | 24,9 |
| **CCCP2** | Cash Contribution for Fruit Producer | 28.080.000 | 47,0 |
| **CCHK** | Cash Contribution for Honey-bee Keepers | 288.000 | 0,5 |
| **SSCC** | Saved State (social) Cash Contribution | 16.476.735 | 27,6 |
| **OC** | Other Contribution, such „intangible values" as value of biodiversity, healthy lifestyle, etc. | 0* | 0* |

** not calculated at the present scenario, Source: own research*

The final figure of this calculation can be found that is about 60 million EUR for Hungary per year is considerable higher than the sales value of the honey produced.

Based on primary and secondary research figures the following input data were taken into account (Table 3):

*Table 3 - Input figures of the recent HEEM-scenario*

| ***symbol*** | ***description*** | ***unit*** | ***value*** |
|---|---|---|---|
| CCCP1 | cash contribution of crop producer | EUR | 14880000 |
| CA1 | cropping area of the country involved honey-bee pollination | ha | 480000 |
| TBF | total number of honey-bee families in the country | hive | 800000 |
| RORHF | ratio of relocated honey-bee families in the country | % | 60 |
| TBFPC | total number of relocated honey-bee families in the country | hive | 480000 |
| BF | honey-bee families per ha | hive/ha | 2 |
| ANAR | average number of annual relocations | Occasion/year | 2 |
| YH1 | average yield of the crop pollinated by honey-bees | t/ha | 3 |
| PRH1 | average price of pollinated crop | EUR/t | 200 |
| Y01 | average yield of the non-pollinated crop | t/ha | 2,7 |
| PR01 | average price of non-pollinated crop | EUR/t | 200 |
| HMC1 | harvesting and marketing cost of the crop | EUR/t | 30 |
| SCCP1 | surplus chemical cost incurred at the crop producer | EUR/ha | 15 |
| SCO1 | surplus other cost of the crop producer due to the relocation | EUR/ha | 5 |
| CCCP2 | cash contribution of fruit producer | EUR | 28080000 |
| CA2 | cropping area of the country involved honey-bee pollination | ha | 24000 |
| TBFPC | total number of honey-bee families in the country | hive | 800000 |

| *symbol* | *description* | *unit* | *value* |
|---|---|---|---|
| RORHF | ratio of relocated honey-bee families in the country | % | 3 |
| TBF | total number of relocated honey-bee families in the country | hive | 24000 |
| BF | honey-bee families per ha | hive/ha | 4 |
| ANAR | average number of annual relocations | occasion | 4 |
| YH2 | average yield of the fruit pollinated by honey-bees | t/ha | 25 |
| PRH2 | average price of pollinated fruit | EUR/t | 250 |
| Y02 | average yield of the non-pollinated fruit | t/ha | 22 |
| PR02 | average prie of non-pollinated fruit | EUR/t | 220 |
| HMC2 | harvesting and marketing cost of the fruit | EUR/t | 40 |
| SCCP2 | surplus chemical cost incurred at the fruit producer | EUR/t | 100 |
| SCO2 | surplus other cost of the fruit producer due to the relocation | EUR/ha | 20 |
| CCCP | CCCP1+CCCP2 | EUR | 42960000 |
| CCCHK | cash contribution of honey-bee keepers | EUR | 288000 |
| HYH | yearly honey yield of the (relocated) honey | kg/hive/year | 50 |
| HPRH | average honey price of the (relocated) honey | EUR/kg | 3 |
| HY0 | yearly honey yield without relocation | kg/hive/year | 30 |
| HPR0 | average honey price without relocation | EUR/kg | 3 |
| ACR | average cost of a one-time relocation | EUR/hive | 12 |
| SSCC | saved state cash contribution | EUR | 16476735 |
| ROSPDN | social contribution recipients | person | 3200 |
| SSPPP | social security payment per person | EUR/person/year | 4000 |
| TSSP | total saved security payment | EUR | 3840000 |
| TBFPC | total bee families per country | hive | 800000 |
| ABFPP | average bee family per person | Hive/person (bee-keeper) | 50 |
| SSC | average state social contribution | EUR | 1200 |
| ROSPD | rate of social payment demanders | % | 20 |
| CCHK | average actual cash cost of honey-bee keepers, the labour cost is not included in the figure | EUR | 70 |
| LCPH | labour cost/hive/year | EUR | 15 |
| MCPH | material cost/hive/year | EUR | 55 |
| VAT | VAT | % | 25 |
| MCWVAT | material cost without VAT | EUR | 44 |
| VATC | VAT cost | EUR | 11 |
| PIVAT | pay in VAT | EUR | 8800000 |
| LCPIRAT | labour cost pay in ratio | % | 47 |
| LCREM | labour cost remained | EUR | 10.2 |
| LCPI | labour cost paid in | EUR | 4.8 |
| TLCPI | total labour cost pain in | EUR | 3836734.7 |
| NPPH | net profit /hive | EUR | 4000 |
| SSCM1 | If NPPH > SSC, then SSCM = 0 | | 0.0 |

*Source: own research*

## CONCLUSIONS

It can be stated by the most important pertaining literature that benefits of honey pollinating are incontestable in many aspects. In this paper we would like to show the relevant literature regarding to this topic and after that we made a model to calculate the economic benefits of the pollination.

Considering that the agrarian market is in a special situation in Hungary (KOZÁR, 2010) and based on these information and other calculated figures, the value of positive externality of bee-keeping for Hungary is close to 60 million EUR in 2009. Since this figure touches about 16000 families, the total figure is close to 4000 EUR per family per year. Other factors not involved in these figures, like preserving biodiversity and healthy lifestyle, etc. were not taken into account, so the actual figure can even be higher. These sums contribute considerably to the rural development in Hungary.

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Economics of agriculture
SI – 2
UDK: 336.77:338.43+368.5

# PROBLEMS OF CREDITING AND INSURANCE IN AGRICULTURE

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## Abstract

*Small farmers in developing countries pay higher insurance premium or interest rate and yet, rural loans or insurance are rather scarce for them. Does it mean rural insurance/loans in undeveloping countries are not profitable? Many analysis and trends in the global financial services market to the contrary, as evidenced by numerous references, yet in developing countries there are some problems in development of these types of financial services, which could significantly assist in the development agriculture. Adverse selection in insurance markets refers to the situation where insurers find it impossible or very expensive to distinguish between high-risk and low-risk insurance applicants and thus prices insurances contracts at the average premium for all individuals, which is inappropriate.*
***Key words:*** *insurance, credit, policies, farmers, risk*

## Introduction

The two phenomenon's affect the insurance market negatively, with the consequences that insurance companies may not be willing to enter the market. In the case of agriculture with small farmers, insurance companies or banks consider there is a higher risk of moral hazard and adverse selection for three reasons.

First, since they are very small, it is more difficult and expensive both to obtain information and control whether the insured farmers adopt the appropriate behavior (does he use enough, less or not enough pesticide or fertilizers?) to reduce the occurrence of the risk insured. Second, as with banks dealing with many small credits, transaction costs are higher with small farmers because of the vast number of contracts

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with limited amount of money insured. In addition, with high geographic dispersion of clients in rural areas, the cost of differentiating between the legitimate and fraudulent loss is enormous. Combining those two constraints makes the final insurance costs more expensive for the farmer, in turn giving him a lower benefit. Considering this lower margin, there is a risk that "bad farmers" will be the first (if not the only ones) to take the insurance and that the good ones will either not take the insurance or take more risk in order to have a better profit.

## Agriculture is riskier than other sectors

The question is why the agriculture insurance or credit riskier than other sectors of the economy. There are many risks, but some of the following are the most common:

*Guarantee* - Without entering into the details of different existing rural collaterals, very often small farmers simply cannot offer guarantee. Even if they own a property, the insurance company or bank could face legal frustration as property ownership is not clearly defined, and/or as there is strong opposition to the selling of the mortgaged land from the community, indirectly meaning there is no market for it. In some case, it will not only be impossible for the insurance company to foreclose on someone's land or agricultural property but financial institutions might even be subjected to political pressures to reschedule or forgive agricultural debts (for example in USA).

*Covariant risk* - Dealing with small rural communities means that it is difficult to diversify your risk as small farmers are all living in the same and small region and producing similar things. Therefore, in case of a drought, storm, disease, the risk is high that they are all affected together at the same time (insurance the risk of loss of income for example in USA). The same will happen if commodity prices decline or with a natural disaster. In addition, farmers sometimes may collude collectively and claim, as a group, to be more severely affected than it is the case in the reality.

*Cause damage and high insurance costs* - If crop production is much lower than expected or cattle die, there is not necessarily a single reason for the damage to have happened and, therefore it is difficult to estimate whether it happened because of a natural hazard or mismanagement from the farmer. This difficulty is higher with small producers, as the microfinance institutions or the insurance company will not have the time to make a close follow up for each of them. Costs are not only higher because there are many contracts involving limited amount of money insured and the difficult assessment of why the damage happened but also because they have to manage a large quantity of small contracts, verify premium has been paid, send reminder if necessary, paying indemnities, answer questions etc. Therefore, the insurance company before entering into the development of this type of insurance, accurately analyze their tariffs on agricultural insurance, the costs of insurance and underwriting result.[4]

Portfolio of geographically dispersed crop insurance contracts can be as much

4 The technical result is the ratio between the settled claims and earned premiums, and he must always be positive. Can be calculated for each insured individual.

as 20 times more risky than an equally valued portfolio of health and automobile insurance contracts. The above mentioned constraints are not specific to insurance but to banks products in general and in rural areas especially, given the small size of the clients living close to one another. While it is possible for a banks to diversify its credit portfolio with a relatively small amount of loans, the situation is quite different with insurance, especially if dealing with rural insurances and small farmers. Because of concentration risks that are highly correlated in small rural areas, the bank giving insurance scheme will require a much higher capital adequacy. This higher capital is necessary in order for the financial institution to be able to reimburse small farmers in case the damage happens which, with high correlation risk, is likely to be very large. However, a higher capital also means a more expensive premium and, in a context of low profit sector (small farmers), may simply be impossible to pay for the poor households. The question is how to overcome this problem.

In theory, there are two ways of reducing those costs while ensuring a good level of diversification:

- Start with very big numbers of clients in different regions or continents. In practice, this solution is difficult, not to say impossible for the microfinance industry, which, by definition, is small.

- A second approach is the reinsurance market. This solution is good but is still expensive because the reinsurer doesn't know how to evaluate the risk on the short term, and for a reinsurance company, a portfolio of insurance is very small compared to what they are used to deal with. For those two reasons, the cost of reinsurance will still be high.

## Different solutions to manage financial risks in agriculture

It is estimated that about 70% of the population of undeveloping countries live in rural areas compared to only 30% in developed countries. So far, banks are reaching 80 millions of clients out of an objective of 500 millions to one billion, most of the clients reached by banks live in urban areas and only few banks provide insurance products in their portfolio. Therefore, the probability of having access to banks products for small farmers is already low and even lower for access to insurance. Insurance could have good added value in rural areas but, with difficult access to it, farmers and, more generally people living in rural areas have found ways to cope with their specific needs. Methods may be old or recent, formal or informal, close to what we call insurance or not, invented by cooperatives or banks and may provide guarantee to the producer or the lender. The best example of this type of development of financial services, we have USD, where the insurance companies and banks combining old and new methods of service delivery, failed to meet the needs to cover the risks faced by rural households.
A first informal insurance arrangement developed in USA and consists on household A to help household B with the opposite being expected later in case of necessity, reciprocal gift exchange are also a form of insurance, if we consider that the benefit expected can be received/given at the "appropriate" time. For people receiving their

earnings once or twice a year, they can insure themselves either by buying physical assets they don't really need in order to be able to sell them in case of necessity or, in case it is available simply by putting part of their money on a savings account which they will use later when needed. When feasible, small farmers may simply diversify their crops or have non farming revenues. What follows are not direct guarantees to small farmers but measures or institutions helping them in securing their revenues, or having easier access to the services provided by financial institutions.

But besides these informal guarantees must be provided and the actual funds to cover the risk in providing financial services in agriculture, and further analysis will focus on management of banking risks and risk insurance. In USA there are three possible formation system of guarantee funds in agriculture::

1. The first one consists on a direct guarantee covering the credit risk of the bank toward the borrower. The expected advantages of such a guarantee system (substitution of collaterals, lack of client's information for the bank is compensated, new type of market for the bank and additionally) were not met.
2. The second type is a guarantee of refinancing, covering the risk of bank refinancing a other bank. This sort of guarantee fund has proved to be efficient in helping finance small farmers or even families dealing with agriculture. Whether the guarantee fund gives its guarantee to the lender against the default of the bank or the final borrower, in most cases, the money of the guarantee fund comes from external sources.
3. The third system, "the mutual guarantee fund", will give to the lender a "group guarantee" and differs from the two first ones in the sense that the local community is financially directly involved for the default payments. In case of default payment from one of the borrower, either the community will pay back or the whole community will have no longer access to credit.

As already mentioned, mortgage exist and are being used by the lender as a good security. However, their effectiveness is reduced by two factors: the ownership is not always clearly defined and there might be strong opposition to the selling of the mortgaged land from the community. Therefore, unless some legal criteria are met, mortgage in the rural part of developing countries are relative. There is a high risk that small producers owning a few acres of land will lose their property, which will make them poorer than before for reasons that are independent of the work they provide: drought, disease, decrease of world price of commodities etc.

A well developed system of licensed public warehouse, like in USA, and the use of warehouse receipts for storage provide different advantages in the interest of both the agriculture in general and the farmer in particular. Among the advantages of a warehouse, we can mention that it provides a uniformed and well regulated system for the storage of grain, it is a good protection for the grain depositors (insuring the quality and quantity of the deposited grain) and it introduces the use of warehouse receipts, which are official documents for ownership and can be used as collaterals for short-

term loans, allowing the producer to sell his products at the most appropriate time. Successful examples of warehouse receipt system are numerous but it must be based in mind that a warehouse receipt has to be based on appropriate regulation that will enable a regulatory agency to control the key component of the system and that there should be no conflict of interest between the manager of the warehouse and the producers (for example if the manager has a direct interest in buying the products he stores at a low price). This technique offers lots of advantages both for the financial intermediaries (good collateral, liquidity of the warehouse receipt etc.) and for the producer (better price stability, access to short term credit etc) but, apart from the regulatory aspect mentioned, the technique cannot be used for products that cannot be stored and would be less interesting if prices are stable.

Credit bureaus, in many developing countries, with their respective advantages and disadvantages but basically, they all provide information about potential borrowers that are not available on the market. This information can be negative (people who pay with delay or don't reimburse) or positive, providing the bank with information such as other existing loans, collaterals, activities etc. In order to develop such a system, some preconditions must be fulfilled: the country must possess national identification numbers for all its citizens (identification number in Serbia), the centrals should be in competition and operate legally, which means that a working judiciary system must be in place and an effective system of private life protection should be in place and defined in the constitution.

In rural areas, analysis of the various outcomes and incomes shows that cycles are essentially yearly cycles but the principal income and outcome periods do not coincide. Therefore, the producer has to anticipate its costs and revenues on a yearly basis. The Management Team in Bank may help the producer in the global management of his farm and his cash flow in particular. Indirectly, the "Management Team in Bank" gives more security to credits given to farmers by preparing with them a yearly cash flow table showing when disbursements and revenues are likely to occur. On the other side, the "Management Team in Bank" may also have some added value by giving to farmers some general technical tools or by finding with them potential new cycles with different periods of financial outcomes and incomes.

## Types of insurance in agriculture

In theory, among the different formal agricultural insurance scheme already existing, we should mention: price (revenue), livestock, crop - yield, rainfall or climate insurance. These types of insurances can be combined and used as collaterals by banks. In addition to those types of insurances, the reinsurance market can potentially be used by the banks or insurance companies to diversify their risk.

In practice like in USA, access to these insurances for small farmers will vary. Furthermore, without clear indication of what is insured and how it will be measured effectively and efficiently, these insurances can only play a limited role in reducing the agricultural risk for small farmers because they face the same problems that agriculture

credit faces with microfinance institutions: asymmetry of information, covariant risk, moral hazard, adverse selection etc.

However, although limitations do exist, the situation is not as negative as it may appear at first glance. On the one hand, with price insurance, information will be transparent and the risk of moral hazard will be low. On the other hand, with new insurance products and appropriate technology, strong complementarily between credit and insurance can be found. Defining index for the remaining crop, livestock and weather insurance, will reduce considerably moral hazard and adverse selection, covariant risk will be managed via the reinsurance market or new market instruments for sharing risk and, with new technologies such as satellite images, data will be measured more precisely at lower cost, reducing considerably the information asymmetry. Therefore, complementarily between insurance and credit scheme do exist and there is a potential for profitable insurances in rural areas. Whether these new insurance products can be used for insurance in rural areas will depend on the environment with preconditions conditions such as historical data and suitable technology available, appropriate institutional means to deliver such insurances, and a proper legal and regulatory for supervision of insurance companies.

*Insurance earnings or the risk of price changes* - The concept of this insurance is simple, if price falls during the period insured, the producers receives a payout equal to the difference between the price the producer chose to insure with the price risk management contract and the international market price on the last date of the option coverage. This insurance can be combined with rainfall and crop insurances and can be used as collateral for banks. However, in reality, small farmers often do not have access to such revenue insurance: the minimum size contract traded exceeds the annual production of individual small farmers, lack of knowledge from the farmer that this type of insurance actually exists and finally, the seller is often unwilling to start a business relation with small size producers characterized by high transaction costs.

Not many examples of *livestock insurance* in developing countries were found in the literature, probably because opportunity for fraud and abuse are very high. However, the example found was in Mongolia, country that suffered tremendous losses in recent winter disasters, with mortality rate of over 50%. The concept is based on an index insurance that would pay all herders in the same region the same indemnity payment, should the regional mortality rate be worse than expected. Therefore, the incentive for herders to work hard on saving his animals during severe weather is maintained but, at the same time, it is reinforced by the fact that herders will compete to have lower than average mortality rates. The fundamental reason why livestock insurance has been chosen instead of individual insurance comes precisely from the mentioned incentive to manage livestock losses carefully. In case the regional mortality rate is higher than the index, all herders, including those who have fewer losses than the average will receive indemnities.

*Insurance yield in agriculture* - Crop insurance is not an easy issue because there are different factors that will influence the final production. In addition, crop risks are correlated and risks of moral hazard already high in agriculture are even higher with

small farmers. In order to reduce moral hazard in undeveloped countries, between 30 to 70% of the crop insurance premium is subsidized. But, on the one hand, developing countries can't afford such subsidy and, on the other, risk that small producers don't work enough if they consider to be well insured is high because, given dispersion of farmers in rural area, the capacity of control from the insurance is difficult, not to say inexistent. Area yield index is a good alternative to secure the farmers' revenue while avoiding the above mentioned difficulties. It consists on paying indemnity when the average area yield falls below a predetermined entry. The area should be large enough to avoid collusion and is generally the size of a county. Area yield index does not only avoid moral hazard, adverse selection and high administrative costs but it encourages individual farmers to have a higher production than the area yield average. In case the area index falls below the established threshold, the given farmer will not only benefit from the indemnity but also from the high price of his products. However, before starting such an insurance scheme, two conditions must be fulfilled. First, there must be some historic yield data available and second, the area yield index has to be measured by an independent individual. In some case, one or both conditions might be difficult to implement and to overcome such problems, weather index, which offers at the same time data that are easy to verify and historical data easy to find, could be considered as a solution.

*Crop Insurance of rainfall* - The key issue with weather index insurance is to have a strong correlation between the index (the rainfall) and the output expected (the harvest). Assuming that the rainfall is below an established amount and that the above-mentioned correlation is high, the compensation will be calculated accordingly. Weather insurance have at least three advantages on crop insurance, first the market is not only open to farmers but to a larger population for whom weather has an impact on their activity, second if there is a slight deviation from the agreed index, then the risk of moral hazard is strongly reduced (rainfall does not depend on the client) and third the administrative costs will also be lower.

However, weather index insurances have their limitation. First, as microclimate exist, some farmers insured with a rainfall index may lose due to a drought at a micro-location, but not receive indemnity if the measured rainfall at the regional weather stations remains above the amount. The opposite situation could also happen: farmer is paid, due to the measures at the weather stations, although he has not suffered any losses. Second, similar situation could occur if the correlation between the index and the outcome is not elevated and not well estimated. Third, weather index insurance cannot avoid completely fraud with, for instance, people trying to modify data measured with ground instruments. Fourth, the intention of such insurance is to give more stable purchasing power to farmers. But if they are not all covered, in case of drought, the ones insured will have a purchasing power allowing them to pay the normal price for the basic products (in short supply) while the ones not insured will simply not be capable of buying the basic products they need. Therefore, should the rainfall insurance not have been accessible to any farmer, the short supply of basic products would have been more equally distributed. In conclusion, it seems that the general advantages of index based

insurance products outweigh by far these risks. What is certain is that weather index insurance will work very well in case of massive droughts or floods, when moral hazard problems are insignificant and fraud irrelevant. In addition, there is a promising role for technology in providing the needed information at low cost with methods such as: satellite images, weather data from traditional ground instruments, weather data from new system, sampling from grasslands to determine nutrient content.

## Reinsurance in agriculture

The principle of reinsurance is that correlated risks at local level become independent at a global level. Therefore, the reinsurance market could be appropriate for rural insurance that cannot start very small and slowly scale -up village by village. However, reinsurance has also some limitations:

- there is no price transparency because it is typically a market where there are few buyers and sellers,
- the asymmetry of information between the buyers (knows much more) and the seller is high
- the reinsurer will ask a high reinsurance premium

## Insurance in region

According to estimates insurance companies, the percentage of farmers in Serbia to ensure the property is approximately 10 percent, while the Serbian Republic, where the damage this year, perhaps the largest, the number is even lower - only about 2.5 percent. Is insufficient and those with basic insurance and pay property insurance flood: according to some data in Serbia just over one percent of farms in Croatia, about six percent, while the number of policies in Bosnia to ensure agriculture for damages inflicted by floods negligible - only a few tenth of the polis. As from year to year storms are becoming more frequent and higher risk to crops, animals and machinery, almost all governments in the region have sought to stimulate the farmers by providing subsidies for this type of security. Annual property insurance premium farm depends on the evaluation of insurance companies and property worth 50,000 euro's in Serbia, the average annual insurance cost 120 euro's, if it comes to areas prone to flooding, this supplement can be five times higher. The Serbian Republic of hectares cultivated land insurance costs about 30 euro's, while acres of land with apple trees should be set aside 1,000 euro's per year. Damages arising in these areas can be several times larger. Apparently farmers in the former Yugoslavia did not know that the floods last year became the first to top the list, even among the 133 natural disasters - after the floods following storms, earthquakes, droughts and fires. This means that in these countries, the percentage of insured farms difficult to reach the level of France where he secured 77 percent of them or Austria, where this figure is 90 percent. It seems that the only chance that the level of insured agricultural land is higher, and thus to avoid the negative

consequences not only for farmers but also for the entire economy of the country, that this type of insurance becomes mandatory, as proposed by some insurance companies in Serbia.

## Conclusion

We can conclude that there is a gap between the possibility of insurance companies in respect of insurance in agriculture on the one hand and the need for insurance by farmers. Although the insurance market and credit for farming, has great potential for profit, insurance companies and even more improved life insurance products, and banks are more focused on other industries. What is an obstacle in the development of financial services for farmers, are risks that cannot be defined and accurately measured, but the lack of legislation to encourage their development, especially in developing countries. Covariant risk must be addressed, and if available, it should be dealt with instrument such as reinsurance market.

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Economics of agriculture
SI – 2
UDK: 614 (100)

# WORLDWIDE ANALYSIS REGARDING THE HEALTHCARE EFFECTIVENESS

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## Abstract

*One of the most important sectors in the human activity is represented by the healthcare system. This is because in this area the man is both subject and object of the activity. In other words, the man actionate over the man. Therefore it is important to see and understand how this activity is completed, which is its effectiveness.*

*In this paper the author wants to make a brief analysis of the effectiveness assessment for the healthcare services within different countries, capturing the characteristics and significant features.*

***Key words:*** *healthcare system, effectiveness, results, efforts*

## Introduction

The concept of effectiveness in the health services domain can be addressed as a scientific dimension, defining the basic concept upon some theoretical models, source of some scientists' preoccupations, university teachers, who are part of public or private groups (Adair, 2006 [1]).

## Theoretical vision

The problematic of effectiveness evaluation in this particular field of activity, constituted a preoccupation of many specialists, managing in time to be proposed a series of models with pragmatic valences not at all neglected for practitioners. In an attempt of systemizing the extremely rich volume of scientific information, found in special literature, the Group of interdisciplinary research for health, from Montreal University (Canada), in the frame of a research issue aiming the global and integrated evaluation of the effectiveness of health systems has inventoried a series

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of models, presented a real value from the perspective of the request to find the optimal solution in our approach to design an evaluation methodology of production competitiveness and distribution of health services in our country, convergent with the practices on world arena. These models are focused, in essence, on the evaluation of organizational effectiveness, at the level of public institutional entities involved in the complex process of health services conscription to every citizen from a certain region/territorial area of a country. So, there are known the following used methods, after the options of the decision-making factors involved, from case to case:

- *The reaching aims model*

It is the most utilized model by the analysts and practitioners and corresponds to functional, rational conceptualization of the organization. According to this approach, an organization exists for fulfilling the specific objectives and its effectiveness evaluation consists of, in these conditions, in estimating in what measure the organization has achieved its goals. (Sicotte, 1998 [2]; Charles L., 2002 [3]).

- *The model of internal processes*

Frequently used, this model accepts the idea that a performant organization is the one that works without obstacles/disfunctionalities following the observance of the established norms, without excessive tensions. Only in this way, the stability and control are valorized. This model places the measurement of organizational effectiveness at the level of production processes of the health system.

- *The model of acquiring resources*

When the organizations are seen as open systems, a major importance it is acquired to the established relations between organization and environment. The acquiring and maintaining at an adequate level of resources is becoming the major organizational stakes. This model represents for numerous managers the operational defining of the organization's object suggesting, that the success resides in the acquiring of resources, their growing and adaptability. The capacity of an organization to adapt to the environment, the necessary resources for a good functioning and its survival become important criteria for appreciating effectiveness.

- *The model of human relations*

Based upon an organic or natural vision of the organizations, the model puts an accent upon the necessary activities for a satisfying climate of collaboration within the organization and for satisfying people's needs who are making an appeal to the services which the organization is specialized to fulfill. This implies that a performant organization is the one, which focuses to function in a healthy quality environment. The stability, consent, motivation, work climate are fundamental values.

- *The politic model*

According to the principles of this model, an organization is performant if it follows to satisfy the internal and external stakes. The model is based upon a politic or strategic vision

according to which the organizations are political arenas, where the actors interact according to their own strategic interests, the accent being put upon negotiation and compromise.

• *The model of social legitimacy*

It is recorded into an ecologic perspective of organizations' functioning, considering that "an organization it is efficient in the measure in which it maintains and survives agreeing on the social processes and results, the aimed norms and objectives. The reputation, prestige and image are, in this case, effectiveness indicators (Leggat, 1998 [4]).

Along with these evaluation models of organizational effectiveness, other authors proposed some methods that are considered to be "*methodological*", among which are remembered:

• *The zero flaws effect*

Within this model it is estimated that "an organization is performant if it does not make flaws or if within it there are not encountered ineffectiveness moments" (Leggat, 1998 [4]).

• *The comparative model of effectiveness*

The model presumes the comparative analysis between similar organizations. Generally, the effectiveness criteria are chosen according to the available dates for different organizations, which are compared.

• *The normative model of the rational action system*

It is considered the most extended evaluation methodological model (popular) of the institutions' effectiveness within the health services domain. Donabedian (1966) proposed that the level of the health care qualities and, in general, the effectiveness could be evaluated being used norms, not only of results but also of process and structure.

## The effectiveness of health services systems in the vision of the international organizations

From the World Health Organization point of view, the evaluation of the effectiveness of the health system services assumes to compare the accomplishing of the system's objectives (health amelioration, reactivity and equating the financial contribution) with what the system should be capable to fulfill, which means reaching the best possible results with same resources.

Organization for Economic Cooperation and Development (OECD) adopted this definition, integrated, although, in the model of aiming goals (objectives).

The Regional European Desk of WHO, in its project PATH (*Performance Assessment Tool for Quality Improvement in Hospitals*) mentions that "*a satisfying level of performance in hospitals means maintaining a functioning which corresponds to societal and professional norms, as well as the ones that are regarding the patients. A high level of performance in the hospitals should be based upon professional competencies*

*in relation with actual knowledge, upon available resources and technologies, upon the effectiveness of resources' usage, upon minimum risks for the patients, upon the patients' reactivity, facts that would lead to a maximal contribution for results in health matters. Within the environment of health care, the performance raised in hospitals, should, moreover, approach the reactivity to the needs and exigencies of the collectivity, integration of services from hospitals in the ensemble of services conscription system and a sustained commitment upon health promotion. A raised performance of hospitals should be evaluated according to the accessibility of hospital services for all patients, regardless of physical, cultural, social, demographic and economic barriers*".

The definition of the European regional Desk of WHO is integrated into the models of aiming goals, internal processes, resources acquisition and social legitimacy.

In Great Britain, the frame of evaluation of the National Health System defines effectiveness as "*results of system's cares and efficient of health care carry out: to recognize that an equitable access is efficient, adapted and in the same time opportune, according to the convened norms*". This definition is integrated in the models of reaching the goals and internal processes.

The Committee regarding the future of healthcare treatment from Canada defines quality (associated in this case with effectiveness) as "*distribution of best attentions possible and obtaining the best results possible, whenever individuals are in relation with the health system or are using its services (...), it is about making the best work possible with available resources. This signifies the fact that there must be reached the fixed goals and objectives, fact which can be measured in rapport with the a priori and valid accepted norms. For patients, the high quality of health care means attentions that correspond to their needs and expectations. For the medical staff, this quality means that the diagnosis put are exact, that them (medical staff) are part of a system which works good and the attentions which they offer are adequate and efficient. For our society, this quality signifies an global amelioration of the Canadians*". This definition is integrated in the models of reaching goals and internal processes.

## Effectiveness evaluation for healthcare services in different countries

As it can be seen, there are multiple definitions given to the concept of effectiveness in the domain of healthcare services. Some of them partially cover the vast area of the analyzed domain. Really, it is difficult finding a global definition to synthesize all aspects concerning the population's health status (Kueng & Krahn, 1999 [5]).

Health status of an individual is articulated upon two pillars, which compete in obtaining effectiveness in health services carry out. It is about, on one hand, the real system of according health assistance, and, on the other hand, the health diagnosis: social and physical environment, socio-economic level, education level or living conditions (Handler, Issel & Turnock, 2001 [6]). From this perspective, it becomes an incertitude the fact that the analysis of national health systems effectiveness cannot be completely and easy to accomplish because of the problems that appear in the approach of evaluation

of the results and difficulties of dissociating the contribution of health system by a series of other determined factors of one's health status; for example, the amelioration of the environment and living conditions which define/give content to activities of entertaining health and disease prevention.

The importance of taking into consideration the effectiveness classifications of health systems must not be put to doubt. Such a classification, even if starts contradictory debates, has evaluation logic, aiming, as any kind of evaluation, to promote a model of good practice for obtaining a better result. Such an objective, of using classifications, is compatible with the role which these international institutions have. So, the WHO roles are that of actions as a carry out man of services, for the national systems of member states, systems seen as health producers. This service carry out is concretized in network supplying ("good practices") for optimizing the health production realized by each system.

Although effectiveness measurement in the sanitary domain is a preoccupation which debuted could be fixed in the middle of the 19th century, its concrete application has begun to be realized after instruments which facilitated the constituting of information systems capable to answer, on one hand, to public powers in their action to know if the expenses run for health. Services carry out are well used, and on the other hand, to patients, better and better informed and interested in the level of health care services carried out by different carry out men.

Measuring effectiveness in the sanitary domain has special practice valences, linked by the oppression of public opinion and by the financial constrains which the know, today, nation health systems. That's why, measuring effectiveness of a national health system must be seen as being in the same time an action (D. Baubeau. C. Pereira 2004):

- legitimate, sustained by the aspirations of public opinion to a better health system and a high responsibility of this system.
- difficult, conditioned by the complexity of health status determinates and by the many actors in the production, distribution and financing of health services.
- political, because the nature of expected efficiencies depends on the objectives enumerated by public powers and by the expectations which the citizens have from health system.

From what could be drawn from the above analyze, on a determined area – a national health system – efficiencies has a multidimensional character, which makes necessary the defining of a package of indicators to reflect the dimensions of this effectiveness.

In order to establish a complete methodology for competitiveness evaluation of the Healthcare National System within Romania, it becomes indispensable to analyze, before all, the different standard procedures of evaluation concerning the effectiveness of the carry out of initiated and put into practice health services by some international organisms as well as by institutional entities from different countries.

Effectiveness evaluation framework of the health system in Great Britain

- Contrary to other countries, Great Britain has a long national tradition of healthcare services, once with the creations, in 1948, of the National Health System – NHS. In this context, the British Health Department established an ensemble of structures for evaluating the effectiveness of its health services system, after 1997 (beginning with the choosing of the new government).

The British health Department developed NHS Performance Assessment Framework (PAF), based on the scorecards balance concept. It is about a unified measures system and of effectiveness evaluation with the aim of obtaining a more global image of NHS effectiveness. In this framework, effectiveness is defined as "results of caring through NHS and efficient carry out of adequate health care: recognizing that an equitable access is efficient, adequate and opportune in time and that it is according to the convened norms".

In the British evaluation framework, there were identified 6 effectiveness domains:

1). Health improvement
2). Equitable access
3). Efficient carry out of adequate health care
4). Effectiveness -> productivity in integrative model
5). Patient experience/care distribution
6). Results in matters of health linked to care through NHS

There were developed 50 indicators for evaluating NHS performance and for measuring the existent cart between this effective performance and desired one.

In PAF, are distinguished 4 analysis perspectives:

- Services user
- Internal gestations
- Continuous improvement
- Financial point of view

In GB, in parallel with this evaluation framework were created different structures for being able to elaborate effectiveness norms and surveillance, developing NHS objectives; among these structures are to be found: National Service Framework (NSF) and National Institute for Clinical Excellence (NICE), Commission for Health Improvement, having as objectives supervising and sustain of the effectiveness evolution (Greenhalgh, Long, Brettle & Grant, 1996 [7]).

The PAF evaluation framework of NHS was firstly applied to sanitary authorities, subsequently to be extended also to health services carry out, as well as in hospitals, as well as at the level of primary care (family doctors) (Goddard, Mannion & Smith, 1999 [8]).

Effectiveness evaluation framework of the health system in Canada - In Canada were initiated measurement and supervising instruments of effectiveness for the health system, at the national, provincial and hospital level.

In 2000, at the federal level, the Canadian Institute of Informing concerning Health (ICIS) proposed in collaboration with the Canadian Statistics a conceptual framework of evaluating the effectiveness for health systems. This model is founded

upon a large conception of health and proposes 4 main dimensions of effectiveness, each of them having corresponding dimensions. (Cassette 1).

**CASSETTE no. 1**

**Main dimensions of performance at federal level, in Canada**

1. **Health status**
   - a. Health conditions
   - b. Human functions
   - c. Well-being
   - d. mortality

2. **Non-medical determinants of health**
   - a. Sanitary behaviors
   - b. Life and work conditions
   - c. Personal resources
   - d. Environment factors

3. **Performance of health system**
   - a. Acceptability – in what points health system corresponds to our expectations
   - b. Accessibility – knowing if we can obtain the services we need and when we need.
   - c. Adequate character – knowing if the care correspond to our needs and if they are established on fixed norms
   - d. Competence – knowing if the knowledge and skills of the medical service carry out men are adequate to the care they supply
   - e. Continuity – how services complete each other – coordination, integration, facilitation to meet again.
   - f. Efficacy – in what concerns the services functioning and in what point they have an incidence upon our health
   - g. Efficiency – touching the best results with the less high costs
   - h. Security – minimizing the eventual risks form an environment or health services

4. **Characteristics of the health system and of the collectivity**
   - a. Health system
     - i. the rate of entries and exists
     - ii. junction thorough grafting
     - iii. autoplastic of the haunch and at the knee
     - iv. consultancy accorded to the practitioners from different medical specialties with serious impact upon health status (mental health, dental services etc)
   - b. collectivity

At the provincial level, many more provinces of Canada elaborated their own evaluation systems and own effectiveness criteria. For example, Quebec, adopted the federal evaluation framework and chose as evaluation categories of public system of health care for province:

- population health
- service's quality

Following the accord between the Federal Minister of Health and Social Services with Health Minister in Quebec, the 2 categories of evaluation retake in a large part the proposed components and objectives in the federal framework. In annex 1, are to be found the indicators of evaluating the efficiencies, in the dimensional structure on these 2 levels of aggregation : federal and provincial.

Effectiveness evaluation framework of the health system in Australia - The federal government of Australia, after 1990, developed a coherent framework of evaluating the effectiveness of the national health system. In 2000, National Health Performance Committee (NHPC) elaborated a new framework of evaluation and of effectiveness measurement instruments (Australian National Health Performance Framework), framework which divides into 3 levels (cassette 2), each one having particular characteristics (this framework was much inspired form the Canadian practice).

**CASSETTE no. 2**

**Levels of performance measurement (Australia)**

1. **Health status and results** – are Australians healthy ? Is health assured for everyone? Where is situated the best improvement possibility?
   a. Health statuses
   b. Human function
   c. Living hope and well being
   d. Mortality
2. **Health determinants** – are the factors which determine health changing in better? Are they all the same for everyone? Where and for whom do these determinants have a bigger risk of deterioration?
   a. Environment and socio-economic factors
   b. Collectivity's capacity
   c. Comportments in health matters
   d. Dimensions linked by the individual
3. **Performance of the health system** – at what level the system succeeds to offer quality measurements concerning health, for improving the Australians' health? Is this level the same for all?
   a. Efficacy
   b. Adequate character
   c. Efficiency
   d. Reactivity
   e. Accessibility
   f. Security
   g. Continuity

Equity is always brought in discussion by the question which is put among each level (domain) of aggregation of the defining elements of effectiveness:"is it the same for everyone?". The intrinsic aim of the Australian evaluation framework is to

improve, in time, the effectiveness of the system. This framework is to be applied at the national, stately (Australia being a federal state) and local.

## Conclusion

Effectiveness in the field of health services emphasis the effect's registration. Unlike economic effectiveness (where the evaluation of the effectiveness is made by taking into account both the efforts and effects of the activity), in the social - culture sphere (including the healthcare system) effectiveness means obtaining the effects. Therefore, the emphasis is not placed on the relationship between effect and effort, but more to the effects. This is because in the health system man is both subject and object of the activity.

Undoubtedly, the issue of health systems effectiveness and services of this nature is more complex than we think. In the present paper we have proposed only to emphasize certain aspects (considered significant by the authors), regarding the concept of effectiveness of health services and existing international procedures for its evaluation. We are convinced that this work may be a useful point of view for other authors and experts in the field, in their attempt to define, analyze and improve the effectiveness of a vital area of human activity: the healthcare system.

*The aspect regarding "***Theoretical vision***" and "***The effectiveness of health services systems in the vision of the international organization***s" represents partial results of the scientific research entitled "Social and economic efficiency in the public health system in Romania, the fundamental vector of the sustainable growth and increased wealth", within the postdoctoral school "The Economy of the Knowledge Transfer in Sustainable Development and Environment Protection" (POSDRU / 89 / 1.5 / S / 56287 project).*

*The aspects regarding "***The effectiveness of health services systems in the vision of the international organizations***" and "***Effectiveness evaluation for healthcare services in different countries***" represent a dissemination of the research project PNII - IDEAS no. 789/2009, CNCSIS Code ID_1839, entitled "Social and economic efficiency within public health services, in the connection to the European Community space norms and standards", project director Claudiu Cicea PhD.*

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UDK: 631.153:636.5 LAJKOVAC

# THE CONDITION AND PERSPECTIVES OF POULTRY PRODUCTION DEVELOPMENT ON MUNICIPALITY LAJKOVAC AREA[1]

*Drago Cvijanović[2], Aleksandar Stojković[3], Lang Jelena[4]*

## Abstract

*The paper points out to a current state, perspectives and possibilities of poultry production development in municipality Lajkovac. It is separated in two parts: 1) Brief review of potential in agriculture and agriculture development level in area of Lajkovac municipality and 2) Poultry production in the Republic of Serbia and perspectives of this production development in Lajkovac municipality. In the first part is given the state review in agriculture of Lajkovac municipality, more accurate, a review of existing resources and level of agricultural development. In the second part, the accent was put on analysis of the state, i.e. on problems and perspectives of poultry products' market development in the Republic of Serbia. In the second part is especially pointed out also to development possibilities of poultry production in the sector of individual agricultural producers, i.e. in cooperation with the firm „Vindija" Lajkovac.*
***Key words**: Municipality Lajkovac, agriculture, poultry farming, cooperation with individual sector, technology transfer.*

1 The paper represents a part of research on the project 149007 „Multifunctional Agriculture and Rural Development in Function of Republic of Serbia's Accession in EU", financed by MSTD RS.

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## Introduction

The municipality Lajkovac is characteristic after long tradition in dairy cattle breeding, after numerous mixed or non-agricultural husbandries (most of husbandries members are full time employed in MB „Kolubara"), as well as after the firm „Vindija" Lajkovac, as a part of business system „Vindija", located in Croatia. The plans of the firm „Vindija", as one of the biggest food industries in the region, will surely influence to further agriculture development in the municipality. As this enterprise invests in big capacities in the field of poultry production and processing, along with development of planned cooperation with individual agricultural producers, the poultry production will surely get great perspective for future development.

## Brief review of potentials in agriculture and level of agriculture development in area of Lajkovac municipality

The municipality Lajkovac, with 18 cadastral municipalities and 15,828 inhabitants (active agricultural population amounts 1,410), belongs to Kolubara district of the Republic of Serbia.

The municipality has favourable climatic conditions, favourable hydro-geology, huge agricultural areas (74.5% of total area of the municipality), quality agricultural land of various types, long tradition in agricultural production, especially in dairy cattle breeding, as well as built objects for livestock fattening. For example:

- According to data of RSO of Serbia (municipalities in Serbia, 2009, page 180-181) – agricultural area of Lajkovac municipality amounts 13.869 ha, out of that ploughs and gardens amount 9,643 ha, meadows 2,081 ha, pastures 1,404 ha, and orchards 719 ha (under vineyards is only 1 ha).

*Table 1: Basic data on Lajkovac municipality*

| | |
|---|---|
| Total area in km$^2$ | 186 |
| Proportional participation of agricultural areas in total area | 74.5% |
| Number of settlements | 19 |
| Number of cadastral municipalities | 18 |
| Total number of inhabitants (on 30.06.2008.) | 15,828 |
| Number of inhabitants on km$^2$ | 85 |

*Source: Municipalities in Serbia 2009, RSO*

- According to data got in Real Estate Cadastre of Lajkovac Municipality (Republic Geodetic Authority), total agricultural land in the municipality amounts 13,710 ha (under ploughs 9,992 ha), and the biggest agricultural areas are in places: Jabučje (4,513 ha), Vračević (1,579 ha), Bajevac (1,473 ha) and Nepričava (1,296 ha).
- Land resources are high-quality, and in zone around major watercourses (river Kolubara) the land is mostly in I and II worthiness class. High-quality agricultural land is especially in places Jabučje, Vračević, Stepanje, Nepričava, Bajevac, Pepeljevac and Strmovo, Donji Lajkovac.
- However, there should emphasize that, according to data of the Centre for Agriculture Lajkovac, the land is characterized by small percent of humus (due to low manure input and decline of livestock fund), and the land lacks with phosphor (especially villages Jabučje, Nepričava, Stepanje), as for disrespect of crop rotation, as well as during fertilization with only one type of fertilizer. The soil acidity, which was a problem, was partly lessen in 2003, when came to higher input of lime.
- It is important to emphasize also a reduction of agricultural land due to enlargement of MB „Kolubara" open pits. For example, the places Mali Borak and Skobalj, which have high-quality agricultural land, owing to enlargement of open pits („Tamnava-Zapadno polje") are moving to the territory of the village Jabučje.

*Table 2: USED AGRICULTURAL AREA, 2009.*
*Companies, cooperatives and family holdings - in ha -*

| | Agricultural area | Ploughs and gardens | | | | | Orchards and vineyards | Meadows and pastures |
|---|---|---|---|---|---|---|---|---|
| | | total | out of that | | | | | |
| | | | wheat | Ind.plants | Vegetable plants | Fodder crops | | |
| Lajkovac | 13,869 | 9,643 | 5,648 | 37 | 839 | 2,307 | 720 | 3,485 |
| | Participation of Lajkovac municipality in agricultural areas of Kolubara district, Central Serbia and R.of Serbia | | | | | | | |
| Kolubara district (=100) | 8.12 | 9.48 | 11.07 | 2.64 | 6.83 | 7.60 | 3.88 | 6.96 |
| Central Serbia (=100) | 0.42 | 0.55 | 0.62 | 0.10 | 0.40 | 0.59 | 0.26 | 0.26 |
| Republic of Serbia (=100) | 0.27 | 0.29 | 0.29 | 0.01 | 0.30 | 0.50 | 0.24 | 0.24 |

*Source: Municipalities in Serbia 2009, RSO*

However, despite of favorable conditions for agriculture development, massive number of working population is employed in the field of minerals and stone

exploitation (32.3%) and food industry (23.5)[5], where are more favorable possibilities to earn, especially taking into consideration republic average salaries[6].

It is inevitable to excel extremely expressed dependency of the municipal population on one enterprise **MB „Kolubara“,** which is the most powerful link in Serbian electric power industry. Most of population (working) works in this enterprise, and **deals with agriculture as additional or aside activity**. They mostly deal with agriculture in order to satisfy their own needs (natural husbandries) or some surplus brings out to a market (semi-natural husbandries). **There is extremely small number of goods (market) agricultural husbandries with permanent and significant market surpluses**. There are following data:

- According to data of Statistical Registration of Agriculture 2002, 3,164 husbandries in the municipality area, in accordance to the resources of income, only 12% of husbandries belong to purely agricultural husbandries, according to income resources. Even 69% belongs to non-agricultural husbandries, mixed 15%, and the husbandries without income – 3.5%[7].
- According to data of the Net for Support to Rural development (Regional office Ljig, Branch office Lajkovac), approximately (superior) agricultural household in the village Bajevac cultivates 5-10 ha of land and has only about 3-10 heads of neat cattle (economic power of these husbandries is mostly determined by members' salaries, mainly employed in MB „Kolubara“).
- According to data of the Centre for Agriculture Lajkovac, only 18 households have realized a regression in 2010 for totally 146 heads of registered cows, by MAFWM of RS (due to Regulation on Allocation and Use of Incentives for Genetic Improvement of Livestock Breeding in 2010, Official Gazette of RS, No. 17/10)[8]. A condition for this regression is a possession of, at least, 5 heads of breeding cows and paid pension and disability insurance. Only 87 husbandries have realized a right to use incentives of Lajkovac municipality in 2010, in dairy cattle breeding.

The husbandries which deal with agriculture (agricultural husbandries and/or mixed husbandries) are mostly directed to[9]:

- **Cattle production (**production of meat and milk), and especially in places Jabučje, Vračević, Pepeljevac, Donji Lajkovac; it is about extensive cattle breeding and combination of stable and pasture breeding.

5 Municipalities in Serbia, 2009, page 130.

6 For example, in the field of minerals exploitation – salaries without taxes and contributions (period January-December 2008) have amounted 49.818 RSD, which is 52% above the republic average of 32.746 in the same period for total economy.
Source: Municipalities in Serbia 2009, pages 140-142.

7 Statistical registration of agriculture 2002, page 388-389.

8 http://www.minpolj.gov.rs/postavljen/126/4827010.0065.11-1.pdf

9 Data of the Centre for Agriculture Lajkovac and Net for Support to Rural Development, Regional office Ljig, Branch office Lajkovac.

- Second most important is **fruit production,** for which are favourable natural conditions, but it is insufficiently developed in relation to the potentials (the most bred are plum and apple); there are no purely fruit husbandries (fruit growing is additional activity, besides cattle production, for about 100-200 husbandries); the average of orchards is small (around 40 a), and only one producer has 2.5 ha under fruits (plum and apple).
- **Crop production** is directed to production of animal feed (especially maize and lucerne) and is not market-oriented; there is small number of wheat producers, although the wheat sows as for tradition (providing own flour), as well as providing straw in livestock breeding.

There is expressed the tendency that new generations more and more determine for work of MB „Kolubara"and state government, where salaries are significantly higher than the one in agriculture field, as well as that young are not interested to deal with agriculture, for the same reason[10]. Besides, the problems in agriculture are bulky and additionally distract from work in this field, and one of the greatest problems, characteristic for whole area of the Republic of Serbia, is placement. Unorganized and uncontrolled placement, often „black market" placement, is followed by high business risk, as regarding anticipation of purchasing prices, as well as regarding recognition of purchase conditions and payments terms. Besides, low prices of agricultural products in purchase (especially during 2010 has been expressed a dissatisfaction of farmers, caused by price of milk) – additionally discourage dealing with agricultural production, and especially those farmers who have fragmentized properties, obsolete mechanization, low productivity, low investments. Such farmers are the most numerous in the Republic of Serbia, and also in Lajkovac municipality.

**As for the enterprises in area of Lajkovac agriculture**, there are very important plans and investments of big enterprise „Vindija"from Varazdin (Republic of Croatia), especially in the field of poultry production. Among this enterprise, in Lajkovac works one cooler, one mill-baking enterprise, several private mills, one private dairy and one enterprise in the field of production of seedlings and components for flowers and ornamental plants growing.

**Cooperatives and associations -** The municipality has no agricultural cooperative (cooperative Lajkovac was established in 1955 and was stopped working in 2000), ; there is especially important Association of breeders of Simmental cattle breed „Kolubara" Lajkovac, which is active and gathers around 350 members, mostly from the territories of municipalities Mionica, Lajkovac, Ljig, part of Ub, part of Valjevo. Beside this association, in the municipality works successfully also the Association of bee keepers, and the Association of fruit growers Lajkovac, established in 2008, was never active. For agriculture of Lajkovac is especially significant existence of Centre for Agriculture Lajkovac, which basic activity is controlled development of cattle, through genetic improvement and preservation of existing genetic resources.

10 Development strategy of municipality Lajkovac 2006-2016, page 19.

## Poultry production in the Republic of Serbia and perspectives of this production development in Lajkovac municipality

The sector of poultry farming is important for food safety of the country and offers great possibilities for providing quick, cheap and high-quality food (poultry meat, processed poultry products and eggs). In the Republic of Serbia, the production of pork is quantitatively the highest, and cattle breeding have the highest participation in total value of livestock production (due to higher meat price and value of heads, as well as for a fact that many heads use for milk production). The participation of poultry meat production in total meat production in Serbia, according to data of RSO of Serbia, ranges from 14.8% to 17.5% in period 2007-2009 (table 3). According to the same source, Serbia dispose with 17.188 thousand poultry units in 2008, i.e. 22,821 thousand units in 2009 (the highest number of fattening chickens, or broilers and hens and roosters)[11].

Generally, the poultry production in Serbia is characterized by production sufficient for own needs, short and unorganized market chain, fragmentized production, non-introduced standards and impossibility to export poultry products in the EU, as well as low level and assortment of industrial processing of poultry meat.

*Table 3. Production of meat in RS in period 2007-20009.*

| | Meat production in thousand tons | | | | Participation in total meat production, in % | | | |
|---|---|---|---|---|---|---|---|---|
| | Beef | Sheep meat | Pork | Poultry | Beef | Sheep meat | Pork | Poultry |
| 2007 | 95 | 20 | 289 | 70 | 20.0 | 4.2 | 61.0 | 14.8 |
| 2008 | 99 | 23 | 266 | 76 | 21.3 | 5.0 | 57.3 | 16.4 |
| 2009 | 100 | 25 | 252 | 80 | 21.9 | 5.5 | 55.1 | 17.5 |

*Source: http://webrzs.stat.gov.rs/axd/poljoprivreda/indexs4.php*

The poultry production realizes on farms for poultry fattening in industrial slaughter houses, as well as in sector of individual agricultural producers.

- **Farms for poultry fattening in industrial slaughter houses,** i.e. enterprises. According to data of MAFWM of RS[12], Serbia disposes with 31 slaughter houses for poultry meat (none of slaughter houses have license for export), than with 29 combined objects (slaughtering, cutting and processing of poultry), out of which

11 All statistical data about number of units and meat production in poultry production is necessary to take with caution, considering that significant part of this production in Serbia is in zone of "black economy" , which will be discussed later on. http://webrzs.stat.gov.rs/axd/poljoprivreda/indexs21.php?ind=1&baza=2.

12 National program of agriculture of Serbia 2010-2013, May 2010, page 79.

only one object has license for export into the EU and with 5 objects which deal only with processing of poultry meat (none of objects have license for export into the EU). The most significant, big industrial slaughter houses, with high participation on poultry meat and its processed products market are „Topiko", Backa Topola[13] and „Agroziv".[14] Besides big slaughter houses, the fattening of poultry is represented also in slaughter houses with lower capacities.

- **Fattening on individual agricultural sector.** It is about the production in numerous small producers, who are unorganized, uncompetitive and unqualified for export. Their production is not continuous and basis on satisfying own or local market needs. According to data of MAFWM of RS, the biggest part of meat production realizes in small family holdings, which are goods producers with about ten bullocks, about one hundred pigs and sheep and **thousand chickens in fattening**[14]. The sector of individual agricultural producers prevail when it is about the production of consumer eggs (about 2/3 of total egg production is linked to numerous small producers).

Some of the most important problems in poultry production are[15]:

- Bad ownership transformation of big systems: cancellation of grandparent flocks centers and unfavourable condition of farms in technical-technological sense (obsolete equipment, uncertain existence of all zoo-hygienic and technological conditions on farms),
- Depending on genetic material import, as well as the components for animal nutrition, lack of programmed (planned) import of genetic material etc.,
- Republic of Serbia still has no Centre for Poultry Farming, which would be a carrier of this sector.
- Fragmentized production in individual sector, characterized by lack of association, non-introduced production standards, as well as unsatisfying level of technical-technological equipment of farms.
- Domination of black economy in business of firms (registration), employment of workers, sale of products etc. According to the research of Serbian Association of Employers, in turnover in black zone are the most of seasonal fruits, vegetables and poultry meat. The black economy prevails in two reasons: 1) significant tax

13 Big Slovenian producer of poultry and processed products „Perutnina Ptuj" is the owner of one of the biggest poultry farms in Serbia (enterprise „Topiko" from Bačka Topola), in which was invested more than 30 million euros in last 3 years, more accurate, from privatization. The food of "Perutnina Ptuj" trade mark, together with goods group "Naravno fit" (PP, POLI i Slim&fit), has dominant position in Slovenia, Serbia, Bosnia and Herzegovina and Macedonia (significant market participation have also in the Republic of Croatia). Source: http://www.vesti-online.com/Vesti/Ekonomija/76729/Slovenci-preuzeli-srpsko-trziste-zivineSource. 24.08.2010

14 National program of agriculture of Serbia 2010-2013, May 2010 page 72.

15 Škorić Rade „Živinarstvo u Srbiji", Eurofarmer no. 09-10/2006 http://www.poljoberza.net/EU09102006_11.aspx

encumbrances, on the one hand and 2) extremely long payments terms, on the other (see Table 4)[16].

*Table 4. Turnover of agricultural products in RS, observed by regions*

| Region | **Poultry meat, turnover in %** | |
|---|---|---|
| | Legalized | Black market |
| Belgrade | 69 | 31 |
| Vojvodina | 77 | 23 |
| Central Serbia | 60 | 40 |
| South Serbia | 46 | 54 |
| East Serbia | 50 | 50 |
| West Serbia | 59 | 41 |

*Source: Conditions and encumberances in business and collective negotiations, Serbian Association of Employers, page 6. http://www.poslodavci.org.rs*

- Lack of long term policy of poultry farming development,
- Impossibility to export due to non-reconciliation of legal regulations, non-introduced standards, uncompetitive and fragmentized production. Taking into consideration customs liberalization, no wonder that Serbia has realized a deficit of 7,7 million USD (see Table 5),

*Table 5: Export and import of poultry meat in 2009.*

| | Value in 000 USD | |
|---|---|---|
| | Export | Import |
| Poultry, uncut in pieces, fresh | 1,412 | 10 |
| Poultry, uncut in pieces, frozen | 465 | 217 |
| Poultry, cut in pieces and refuse, fresh | 2,060 | 19 |
| Poultry, cut in pieces and refuse, frozen | 852 | 1,073 |
| Poultry liver, frozen | 0 | 26 |
| Meat and other poultry products, ns | 874 | 8,591 |

*Source: http://webrzs.stat.gov.rs/axd/spoljna/izbor.htm*

- Lack of incentives by the government and unfavourable general conditions of business (unfavourable business climate, especially unfavourable conditions of funding for introduction of new technologies, production standards etc.).

In order to improve the situation in the field of poultry farming, and realize a surplus in exchange in this production and domestic market settle with high-quality and controlled

16 Results of survey conducted on sample of 648 economic subjects in agriculture branch point out that 58,1% of economic subjects in RS collect their claims in term longer than 120 days, and registered agricultural producers collect their claims, in average, in 133 days. Source: Conditions and encumberances in business and collective negotiations, Serbian Association of Employers, pages 4-6.

products – the following is necessary to be done[17]:

- Introduce legal production,
- Enlargement of production, through associations and clusters of producers and modernization of capacities,
- Renewal of grandparent flocks centers work in order to decrease import dependence in providing productive hybrids of heavy and light type and planned import,
- Put an accent on final products supply, i.e higher phases of poultry meat and eggs processing, with improvement and change of supply type. For example, in our supply prevails egg with eggshell and chicken body, e.g. on American market does not almost consume, so called „red"meat, i.e. drumstick and thigh (red meat either export or further process). Serbia also has the production of consumer eggs, and does not have processing capacities (powdered eggs, liquid or some semi-products, as for industry, as well as for consumption).
- Revival of turkey, ducks and gooses production, from aspect of domestic, and even more, international market,
- Revitalization and rationalization of traditional extensive, i.e. semi-intensive system of breeding poultry aiming to produce poultry meat and eggs of special quality, also from aspect of domestic, and even more, international market. In this case is possible that special place take hilly-mountainous areas.

**In Lajkovac municipality, the poultry production is not developed.** According to data of the Centre for Agriculture Lajkovac, individual agricultural producers deal with poultry production to satisfy their own needs, and only one producer deals with this kind of production seriously.

In future period, this production in the municipality can have great perspective, thanks to investments and investment plans of the biggest enterprise in the municipality – the enterprise „Vindija" from Varaždin, Republic of Croatia. This enterprise had bought in 2005, the cooperative dairy „Lajkovac" from the bankruptcy, and in 2010 will start fattening of the poultry. This enterprise had built a farm for fattening broilers in the place Rubireza on around 10.5 ha, capacity of 180,000 broilers, and when the farm reaches full capacity, it plans also the construction of:

- Slaughter houses and plants for processing poultry meat (annual capacity of slaughter house would be 40 thousand tons of poultry meat, with completely automated line of high-processing level); building slaughter house is hindered and sluggish by inefficient state, i.e. administrative-legal problems (agglutination of cadastre municipalities), as well as unsolved infrastructural issues (water, electrification and similar);
- Dairies (it should process annually 124 million liters of milk), as well as
- Cooperation with individual sector regarding poultry production.

17 See more in: Škorić Rade „Živinarstvo u Srbiji", Eurofarmer no. 09-10/2006 http://www.poljoberza.net/EU09102006_11.aspx

The cooperation in the field of poultry production, which this enterprise plans to make, will exactly provide that more and more agricultural producers, along with transfer of technology, knowledge and all necessary inputs (food and one-day chickens) for production – start the chickens fattening in their own farms. Along with favourable credits, the purchase of total production will be guaranteed to the producers.
The municipality Lajkovac supports development of agriculture through the budget Fund for Agriculture Funding („Official Gazette of Lajkovac municipality" no. 7/09), and in 2010, the assets for realization of the Program for Development and Improvement of Agriculture amount 7,200,000 RSD. The basic goal of funding the farmers through the budget fund for agriculture is strengthening of individual agricultural households, directing and adjusting of agricultural producers to market conditions, as well as to the rules and standards of the EU, increase of competitiveness and adoption of new skills[18].

Although a budget fund for funding agriculture, for now, does not include a support to the producers in poultry farming, in the following period, together with development and strengthening of cooperation between the enterprise „Vindija" and farmers – there can be expected setting up the supporting system to goods producers and in the field of poultry farming. There can be expected that the municipality take place in promotion of poultry products, than in activities of co-funding the participation of domestic producers on fairs or agriculture-tourist manifestations on which would promote the local products etc. Besides should point out that the municipality, in further period, plans to form a public enterprise Directorate for Agriculture, establishment of the Fund for Agriculture, as well as intensifying the activities on construction of Agribusiness centre on 3,7 ha.

## Conclusion

Although in Lajkovac municipality is not developed poultry production, it can have great perspective in future period, thanks to investments and investment plans of the biggest enterprise in the municipality – the enterprise „Vindija" from Varaždin, Republic of Croatia. This enterprise had bought from bankruptcy the cooperative dairy „Lajkovac" in 2005, and during 2010 will start poultry fattening in around 10.5 ha (capacity of the farms is 180,000 broilers). „Vindija"have plans to build slaughter-houses for poultry, and plants for processing poultry meat, as well as to build dairies. Especially great perspectives for development of poultry production offer plans of „Vindija", to develop cooperation with individual sector in future period. The cooperation will provide that many agricultural producers, along with technology, knowledge and all

18 Major incentives are directed to cattle production, than sheep production, fruit growing, bee keeping. The municipality gives a financial support also for herbicides purchase, for analyzing the soil quality, hail protection, for improvement of farmer's professional skills etc. Program of agriculture development and improvement in Lajkovac municipality for 2010, http://www.lajkovac.org.rs/0/program_poljoprivreda_2010.pdf

necessary inputs' (food and one-day chickens) transfer, for production in „Vindija“, start to fattening poultry on own farms, and with favourable credits, the producers will be guaranteed the most important one – repurchase of total production.

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Economics of agriculture
SI – 2
UDK: 305-055.2:631.11.11 (497.11)

# WOMEN AS A FACTOR OF URBAN AGRICULTURE DEVELOPMENT[1]

*Jovana Čikić, Marica Petrović*[2]

## Abstract

*The paper is focused on analysis of female labour force on family farms as a factor of urban agriculture development. The problem is being analyzed from the aspect of socio-demographic indicators of female labour force as a development potential: economic activity and level of education. The purpose of the analysis is to point out the main characteristics of female economic activity and level of education as a potential for urban agriculture development in urban and periurban area of Novi Sad.*
***Key words**: women labour force, economic activity, level of education, (peri)urban agriculture, Novi Sad*

## Introduction

One of the important elements in researching the development possibilities and potential benefits from urban agriculture[3] is the issue of labour force or characteristics of urban farmers. In the research of labour force, one of the crucial aspects is gender issue. Gender issue in labour force in agriculture is a classical sociological question which, in the context of urban agriculture, opens new dilemmas and research problems. Thus, one of the questions that can be asked is whether urban agriculture, due to its

1 The paper is a part of the research on the projects „Multifunctional agriculture and rural development in function of Republic of Serbia integration in European Union“ (MSTD, No. 149007) and „Socioeconomic and cultural characteristics and potential of Vojvodina as a factors of regional connexion and European integration“ (MSTD, No. 149013).

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3 The concept of urban agriculture refers to a production of food and other goods that result from agricultural production within urban, periurban and suburban areas. Such concept is used in the meaning that are representing Mougeot (2000: 6-7; 2006: 4-5) and de Zeeuw (2004: 2-3).

specifics[4], preserve or transform established gender relations in the sense of: changes in labour division, participation in decision making, availability of necessary resources/ inputs for the production, orientation towards market (weather the farm owner is a male or female), etc. Essence in researching gender issues in labour force is to establish level of recognition of women as active participants in urban agriculture as a form of economic and social reproduction of family farms[5].

Also, question of possibilities for urban agriculture development can be very significant in researching unemployment issues in urban areas, especially in transitional societies. In such context, gender issue is being additionally emphasized, due to the fact that the significant portion of unemployed are females of working age, with lower job qualifications who simply are not propulsive in the severe labour market. For one segment of such female population, especially ones living in periurban areas, there is a chance for self-employment in agriculture.

Aforementioned, research in gender issues also implies the basic insight into the main socio-demographic characteristics of urban farmers that derives from their social roles, social positions and general social and cultural features of the communities they live in. This context is the framework for the analysis of the female labour force on family farms in urban and periurban area of Novi Sad.

The paper is focused on the analysis of two socio-demographic features of female labour force on family farms – their economic activity and level of education. The purpose of the analysis is to point out the main characteristics of these socio-demographic features in the context of potential for urban agriculture development in urban and periurban area of Novi Sad.

## Method of the research and data resources

Selected socio-demographic indicators of female labour force on family farms in (peri)urban area of Novi Sad are being analyzed based on the data collected in the *System of information in agricultural extension of Vojvodina*[6]. The analysis is based on data on household members of the family farms that are collected in the period January

4 On specifics of urban agriculture and differences from so called rural agriculture, more in: de Zeeuw (2004: 4-5).

5 On aspects of gender issues in urban agriculture labour force, more in: Hovorka, de Zeeuw, Njenga (2009: 13-25). Also, see matrix for the analysis of gender issues in urban agriculture labour force activities (Hovorka, 1998: 26). On development of the research interest and annotated bibliography regarding gender issues in urban agriculture see in: Hovorka (2003: 279-323).

6 System of information in agricultural extension of Vojvodina (approved by the Secretariat of Agriculture, Forestry and Water Management of Vojvodina) is the official system for registering the main features of the activities of extension agents working in Agricultural Extension Service of Vojvodina as well as the main characteristics of households with whom agents work.

- March 2010. It is a total of 295 selected family farms that are cooperating with the extension agents of the AESV organizational unit in Novi Sad[7]. Portion of females in the total population of selected family farms (1.265 members) is 47,7%.

## Women labour force on selected family farms in urban and periurban area of Novi Sad – economic activity and education

Contingent[8] of female members of working age who are living on the selected family farms in (peri)urban area of Novi Sad consists of 427 women or 70,7% of total female farm population[9]. Comparing to total female members of all selected family farms in Vojvodina, contingent of female members of working age on family farms in (peri)urban area of Novi Sad is slightly larger which derives from their favourable age structure[10]. Recognized differences in the total and sample female population could be explained by the influence of the nearby large urban centre (Novi Sad). In general, rural settlements and suburban areas that are surrounding large urban centres are more convenient place to live than remote ones, in infrastructural, communal and institutional sense. Providing options for achieving higher living standard, these settlements retain better demographic structure, unlike smaller rural settlements remote from urban centres which do not get to answer their residents' life needs and aspirations.

While the size of population of working age shows only labour force potential, more significant indicator of existing female labour force on family farms is their economic activity[11] (Tab. No. 1).

7 Extension agents employed in organizational unit of Agricultural Extension Service of Vojvodina (AESV) in Novi Sad work with farms located in nine municipalities in the areas of the South Bačka District: Novi Sad, Bač, Bačka Palanka, Beočin, Sremski Karlovci, Temerin and Žabalj.

8 The contingent of female population of working age includes all women aged 15 to 59 years.

9 Contingent of females of working age is a little bit smaller than the contingent of male labour force of working age (75,9% of total male population in selected family farms).

10 Female members of working age living on selected family farms in Vojvodina make 67,2% of total female population. Favourable age structure characteristics of females living on family farms in (peri)urban area of Novi Sad in comparison to age structure of total female members of all family farms in Vojvodina reflect in lower average age (37,5 years to 39,3 years) and lower value of aging index (0,63 to 0,84).

11 Economic activity of population living on selected family farms is defined according to employment outside or on the farm. Those female members who are not economically active outside the farm and who have finished schooling are considered to be engaged in agricultural production on farm. Those female members who are still in school are considered to be supported.

*Table No. 1. Female members of selected family farms in urban and periurban area of Novi Sad, according to the economic activity*

| Economic activity of the female members | Number | % |
|---|---|---|
| 1. active outside the family farm | 60 | 9,9 |
| 2. active in agriculture on family farm | 332 | 55,0 |
| 3. supported female members | 178 | 29,5 |
| 4. retired female members | 34 | 5,6 |
| Total | 604 | 100,0 |

*Resource: System of information in agricultural extension of Vojvodina; calculation by authors*

Since among selected family farms in urban and periurban area of Novi Sad, according to income source, prevail strictly agricultural farms[12], as it was expected, economic activity rate of women that are employed outside the family farm is very low – only 9,9% of women have permanent employment in a company. Regardless their official employments outside the family farm, most of these women are also engaged in agriculture on family farms.

Unlike this, most of the women (55,0% of total female population on selected family farms in area of Novi Sad) aren't officially employed and they are considered to be economically active in agriculture on family farms. Although most of these women say for themselves that they are housewives (55,4% within this group), they, at least as helping members, participate in production of goods and services on family farm and therefore, generate total income coming from agricultural production[13].

Presented data confirm the statement that women living on farms more often perceive themselves as housewives not as farmers, regardless to their almost equal participation in agricultural production. Such attitude indicates that women perceive their production role in terms of maintaining the household, in that way, depreciating their contribution to gaining income on family farm.

Other significant indicator of female labour force potential is their level of education. As it was expected, among women of working age on selected family farms prevail females with secondary school education (50,4% of total women of working age). Also, portion of women with the lowest level of education (only primary education) is significant (19,7% of total women of working age).

12 Of total 295 selected family farms, 197 (or 66,8%) of them have no single member employed outside the farm and their income is solely from agricultural production. Other 98 (or 33,2%) farms can be, according to the income source, define as mixed, considering the fact that at least one member is employed outside the family farm.

13 Only 21 female members of the family farms said for themselves that they are farmers.

*Table No. 2. Educational structure of female members living on selected family farms whose schooling is finished, according to their official employment outside the family farm*

| Level of education | Females active outside the farm | | Female engaged in agriculture on family farm | |
|---|---|---|---|---|
| | Number | % | Number | % |
| 1. without school | 0 | 0 | 2 | 0,6 |
| 2. primary education | 1 | 1,7 | 130 | 39,2 |
| 3. secondary education | 39 | 66,1 | 181 | 54,5 |
| 4. higher school education | 4 | 6,8 | 12 | 3,6 |
| 5. faculty education | 15 | 25,4 | 7 | 2,1 |
| Total | 59 | 100 | 332 | 100 |

*Resource: System of information in agricultural extension of Vojvodina; calculation by authors*

If level of education is examined in a relation to economic activity (Tab. No. 2), it can be observed that females who are active outside the farm have favourable educational structure (significant portion of female with higher school and faculty). As opposed to this, women who are engaged in agriculture on family farm have more often only primary education, which put this group of female into the vicious circle of difficult possibilities for working engagement outside the family farm agriculture. Also, while examining educational structure of women engaged in agriculture on selected family farms, it can be observed that only 20 of them (or 6%) have formal education in agriculture[14]. Presented data only confirm the statement that the agriculture, as those women's occupation, is not their first choice but imposed necessity.

## Women as farm owners – formal right to decision making

Particular aspect in the analysis of the women`s role in urban agriculture development is the issue on participation in decision making. This issues is a subject of few sociological researches[15] which, apart from time distance, most of them have the same conclusion that the decision making process is still based on the pattern in which making decisions on organization of every day household activities is left to women, while decisions on organization of agricultural production and farm make men (in the most cases, the farm owners). For this reason, a significant element in researching women's role in agricultural development is to establish general socio-demographic characteristics of female farm owners. In the case when women are farm owners it is

14 Of total of 20 women in this group, 18 of them have secondary education and two of them have faculty education.

15 See: Erlih (1971), Babović, Vuković (2008).

presumed that there is more equal form of decision making, or that women's formal farm ownership facilitates their real participation in making vital decisions.

According to data, women as farm owners appear only on 18 selected family farms in (peri)urban area of Novi Sad[16] (6% of total number of 295). Apart from the total population of female farm owners in Vojvodina (who became farm owners mostly because there is no male to overtake that role), among female farm owners in (peri) urban area of Novi Sad, this is not the case. To be exact, only in two cases women are farm owners because they are single or widow and in only five cases women are farm owners because their husbands are employed outside the farm.

Apart from the male farm owners (among them few have employment outside from the farm) there is none female farm owner who is employed outside the farm. This situation can be an indicator that the woman`s right to decision making (which has been formalized through her status as a farm owner) is actually enforced. Women are entrusted with farm ownership in the absence of their other employment or income source.

## Conclusions

Woman's active engagement in agriculture on family farm has always been understood, but not properly articulated or valued. Woman's productive role has often been marginalized and depreciated. Specifics of organization of agricultural production on family farm imply synergy of labour and life. Therefore, woman has multiple roles – besides being a mother and wife, she also takes care of a household and has active engagement in agricultural production.

According to the fact that they make a significant portion of economically active population, women are entitled to be considered as an important factor of farm development. Nevertheless, as it is shown, core barrier to women's more considerable engagement in agricultural development is a lack of sufficient self-perception as economically active members of farm households, with their, in general, unfavourable educational structure, especially lack of education in agriculture.

Thus, one of the first steps in urban agriculture development on our farms is to encourage women to educate and self organize in order to facilitate accessibility to institutions that can be of their assistance. A significant part in this process should have extension service because it is already familiarized and cooperating with family farms.

Also, it is of great importance to increase women`s participation in decision making, especially in making decisions regarding farm management. Raising women`s

16 Portion of women farm owners in periurban area of Novi Sad is a little bit higher than in Vojvodina, in general (6% to 3,4% of female farm owners in total number of selected family farms in Vojvodina). Also, among 18 family farms with female owners, five of them are located in urban area of Novi Sad. Nevertheless, due to the small number of cases in which this occurred, it cannot be concluded whether between farms members (who live in urban area) exist more gender sensitive and equal model of farm inheritance and management than between farm members in periurban or typically rural areas.

participation in decision making requires their encouragement to mobilize and take an active role in defining their own position on family farm.

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Economics of agriculture
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UDK: 630 (497.6)

# MULTIFUNCTIONAL AGRICULTURE OF RURAL AREAS IN FEDRATION OF BOSNIA AND HERZEGOVINA IN PROCES OF TRANSITION

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## Abstract

*In agriculture transition conditions in Federation of Bosnia and Herzegovina, conceptualization of modern agricultural household is developing slowly and it is not on the satisfying level. Main feature of agriculture in Federation of Bosnia and Herzegovina in the future will be based on small and mid-sized agricultural households. Elements of production diversity, and certain extensively will be kept for a while and that will keep relatively higher number of people in rural areas. Number of people, lower level of production specialization and preserved elements of traditional solidarity, participation and identification of people from rural area with their community are preconditions for preserving and development of rural community. Also there is possibility to develop new content of rurality, based on natural, technical and other type of new agrarity and rurality, which presumes partial agricultural activities, in other words partial life in the village, but based on new socio-cultural standards. In that context, more people could be connected to the village, either by working there without living, or living there permanently and not working in agriculture, which is becoming frequent case in developed world. Those are modern forms of ruralization or neo-ruralization which can be used as possible theoretical redefinition of current rural paradigms, especially in connection to the modernization theories. In the profiling process of rural areas in new conditions, institution of village could be of great use, and have to be developed and adapted, with forming the new ones. This applies to the traditional village institutions (country family, school, religious facilities, agricultural community, etc), but also to the new ones - such as modern agencies for rural development on national, regional and local level which exists in many countries in the world.*

***Key words**: multifunctional agriculture, rural development, transition*

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## Introduction

Transition is a process of building new economy and society types, which means a transitioning to market economy and aiming toward integrated market model. Opposite to reform, transition presumes that there is no part of economy outside the transition process, its goal is to build efficient and competitive market model and to abandon non-market system. Agricultural transition is long-term and very important strategic task which consists of understanding how and why situation is changing in particular branch and economy in general and of forming a vision for revitalization of the subject in question. Therefore, agricultural transition is complex process which comprise of several phases and refers to privatization, restructuring, competition, de-monopolization, rural area concentration and motivation of employees to achieve better market position.

Since the beginning of the European unification idea, common agricultural policy represented not only the way of achieving, but the strongest instrument of integration. As the result of necessity to develop effective ways of self-sufficiency in food production, common agricultural policy outgrow in economic philosophy, which leaves deep impact on European and global economic development and at the same time represent important factor of influence on numerous countries gravitating towards European union. Physiognomy and instruments of common agricultural policy from Treaty of Rome in 1957 went through significant changes, in other words basic standing in common market premises, financial solidarity and European Union establishment have changed. Common agricultural policy overgrow into precise mechanism, not just of common agricultural policy, but as integral approach to rural development, whose main pillars assume economic, social and ecological policies. This way, parallel with common agricultural policy development, transition countries were oriented towards accepting standards of common agricultural policy and as the way to ease integration with European Union.

Agricultural transition process in Federation of Bosnia and Herzegovina did not resolve main agricultural problems so far, it even worsens them. Rural areas are economically pauperized, with undeveloped communal and social infrastructure. Small and un-rationally divided rural households are not profitable and do not give possibility to develop commercial agriculture. Instead, agricultural households oriented toward quality and have necessary preconditions are facing huge market competition. Development and entrance of new non-agricultural businesses in rural area are not always a part of planed process, but consequence of inability to do business in primer sector. It is important to develop new agricultural structure, introduce new market models, apply system of financing and crediting, introduce exchange market, draft new model of agricultural cooperative, build concept of rural development, harmonize agricultural legislation with rules and standards of European Union, in other words, create European agricultural model.

# Multifunctional Agriculture, Agriculture Politics and Rural Development in Federation of Bosnia And Herzegovina

During second half of 20th century, rural area of Federation of Bosnia and Herzegovina was shaped on paradigm of city - village confrontation, industrialization and de-agrarisation, public and private ownership, big agricultural households and small agricultural households. That paradigm excluded, in other words, anticipated integrated and multi-sector complementary development with the city. That created pauperized rural potentials which are hardening implementation of new economically sustainable model of rural development. But, seeing rural area as one specific form of social and economic community embedded in one particular space, it is possible to identify its resources and advantages which have to be integrally valuated and improved to reach economic sustainable development. Rural development policies should not be considered as the part of agricultural policy, in other words agricultural policy is just one of the elements of integral rural development policy. Therefore, support to agricultural production will not assure quality of rural development, while quality multi-sector rural development can assure survival and raise of quality agricultural sector. International experience shows that successful local communities are the ones who manage to preserve its ambience and at the same time to achieve creative adaptation to extreme changes (Zmaic, 2009).

Rural development policy therefore, has to lead towards several basic criteria's: territorial approach instead of sector approach, stirring networking and forming cooperative relationships, concentrating on collective efficiency instead on individual, multi-sector approach to integral development, stirring development "down" on endogenous resources, preserving local identity and social capital, stirring innovation and promoting completion with quality instead with quantity.

Concept of multifunctional presumes model to achieve growing sustainability by assuring non marketable public goods in agriculture and rural area. Concept of multifunctional in agriculture is connected to the market production by diversification of activity of multifunctional agricultural household, and in rural area it is connected to doing multifunctional activities of agricultural producers and other participants in rural economy independently from agricultural production. Until the end of year 1990 multifunctional agriculture marked European trend of agriculture nature and rural area preservation, which contributed to the vitality of rural population and corresponded to the demands of consumers in term of quality and health safety of food, environmental protection and welfare of animals (EC, 1997:102). Multifunctional in agriculture contributes to expansion and development of rural multifunction concept. New rural development policy of European Union is based on four fundaments: expansion of agricultural competition, managing land in ecologically acceptable and sustainable way, improvement of quality of life in rural areas and realization of activities through entrepreneurial initiative in rural area based on principle of bottom-up and top-down.

Federation of Bosnia and Herzegovina in most of its rural areas has all preconditions to promote and to successfully implement concept of multifunctional agriculture and integral rural development, because of its rural area diversity, natural resources, preserved rural ambience, tradition and unused potential for development of non agricultural activities in rural area. On

the other hand, there are some limitations and weaknesses such as unfavorable production and ownership structure, unused human resources and mechanization, undeveloped infrastructure, lack of entrepreneurial initiative, cooperation and motivation in economy of local community. Agriculture restructuring, which is necessary, can not be directed in creating smaller number of larger commercial type agricultural households oriented towards specialized market production. It is important to respect the role of both small and midsized agricultural households in development of rural economy and rural area preservation. Survival of above mentioned agricultural households is conditioned by diversification of economic activities, where it is important to take into the consideration interaction of agricultural and non-agricultural activates, which enhance total employment and revenue in rural area.

Dynamic processes happening in rural economy have to contribute to standardization and stability of total income of agricultural households in rural areas, where non commercial and small commercial agricultural households have to diversify their activity towards non-agricultural business and to add revenue from agricultural activities to total revenue outside agricultural household on the level of parity income. That way diversification trend of economic activities in rural areas is being more expressed and present and it is becoming almost universal process.

In practice the proposed model is rarely being realized, taking into the consideration that there are obstacles for entering into non-agricultural businesses at the level of agricultural households and because of the risks at level of revenue and at the level of region which deform basic relation and deepen revenue differences instead of shrinking them. To remove these obstacles it is necessary to do on time identification of forms of non-agricultural and total revenues of household's independence, which can be spotted through relations in the structure of revenue sources of agricultural households. That way, greater portion of revenue from non-agricultural activities in total revenue have small agricultural households in dynamic economic- agriculture activities with developed infrastructure, with higher population density, with higher number of non-agriculture labor force and lower tolerance to enter labor- intensive non – agriculture businesses which represents conventional ratio. On the other hand, non-agriculture businesses have higher entrance tolerance which demands higher capital investment and economically and strong agriculture households in rarely populated areas with weak infrastructure basis and undeveloped agriculture, who with their traditional technologies are blocking labor force in agriculture households. (Zmaic, 2009)

In total, small and mid-sized agricultural households would have to play the key role in rehabilitation, preservation and integral, multifunctional development of rural areas, and by that to mitigate the whole process of transition. Reformed agricultural policy into policy of rural development is giving the vitality to mixed resources limited agricultural households, which can take part in other business of rural economy. In some countries (France) it is considered that mixed agricultural households in current phase of development can represent the prevailing model of development inside new European concept of multifunctional agriculture. Despite of numerous research of rural area in Federation of Bosnia and Herzegovina and warning on its current limitation and advantages, so far agricultural policy did not include elements necessary for its developments into its goals.

To stir these measures in the right direction, it is necessary to use strategically and legally affirmative goals in practice:

- Introduce unique system of criteria's for defining rural areas comparable with European union system;
- Promote entrance of young people in agriculture by measures of structural policy, to train farmers and to stimulate business connecting.
- Promote investments in agricultural households for adaptation to the market needs, better work and life conditions for farmers, environment and biological diversity protection.
- Implementation of cash stimulants in agriculture have to be simplified and rationalized, invest in market infrastructure, regulate market functioning, speed up privatization of state owned agricultural land and agro-food companies.

On the local level stimulate programs which can be integrated into state plans of sustainable development and at the same time to be useful to local community which needs to participate in its creation. Assure development of governmental structures and to train agro-political decision makers in order to make them more aware of the connections between macroeconomic, regional and sector policies, in other words agricultural and rural environment.

## Research Results

Rural development is set of policies, measures and activities whose goal is to have comprehensive economic, social and cultural progress of the people in rural areas. All of them are being planed and implemented with respect to the principles of sustainable development with preserving and enhancing the quality of environment.

In this research we conducted analysis of certain strategic documents and the level of their implementation.

Strategic plan for harmonizing agriculture, food and rural development (2009-2011) in Bosnia and Herzegovina, which led to Operational program for agriculture, food and rural development and to Operational program of FB&H for agriculture, food and rural development includes six priority areas where three of them are related to the measures for rural development:

1) Increase competition of agro-food sector in Federation of B&H by indirect (not connected to production) measures for production, refinement and trade support. Federal ministry of agriculture, water supply and forestry is through the program "Stimulus for agriculture" in 2008 started the process of transition from direct support for product to indirect support in the form of cash support for capital investment and investments in to agriculture households - rural development.

Increase of competitiveness of agricultural households is being realized through

introduction of measures "Support of young farmers"

Operational program of FB&H for agriculture, food and rural development presumes introduction of seven pilot measures:

- for investments in agriculture households producing milk,
- for investments in agriculture households producing meet,
- for investments in agriculture households producing fruit and vegetables,
- for investments in agriculture households producing corn,
- for investments for refinement
- for investments for support of producers associations,
- for investments for support of land consolidation.

Above mention pilot measures are not introduced as individual measures in Program "Stimulus for agriculture" in 2008, but are included in the measures "Investing in agricultural households" and that way these measures give the opportunity to applicants to obtain cash supports.

Measures for investment support of producers associations and measures for support of land consolidation are also introduced within the scope of program "Stimulus for agriculture" in 2008, independently from measures of rural development.

2) Protecting rural environment of Federation of Bosnia and Herzegovina by supporting programs for agricultural environment.

Operational program of FB&H for agriculture, food and rural development address to the following measures:

- pilot measure of investing for support for introduction of ecologically acceptable organic food,
- support to authentic and traditional plant and animal species, and number of measures related to forests and forest industry, and also water sector.

As priority areas in the program "Stimulus for agriculture" of 2008, Federal ministry of agriculture, water supply and forestry lay down two supporting measures:

- support for areas with harder condition for agriculture and
- support for organic agriculture.

Measures of support to authentic and traditional plant and animal species are included through measures of additional activities.

Measures for forests and forest industry and water sector are not created as the part of supports for rural development.

3) Diversify rural economy activities and enhance quality of life in rural areas of Federation of Bosnia and Herzegovina. Operational program of FB&H for agriculture, food and rural development in this priority area address the following measures:

- for rural diversification and employment generation,
- for investment in local infrastructure
- for investment for support of rural tourism,
- for promoting access and availability for consultant and advisory services.

Federal ministry of agriculture, water supply and forestry, as the part of above mentioned priority areas, addressed two measures in the program "Stimulus for agriculture" of 2008:

- additinal activites,
- rural infrastructure.

Through these two measures aplicants were able to offer project for all for measures planed in Operational program of FB&H for agriculture, food and rural development.

When talking about the degree of implementation of above mentioned strategic documents, as the example we took the measures from 2008. We analyzed some financial indicators and which were analyzed as the total amounts and percentage of rural development budget in total budget for agriculture, as the total amounts and percentage of financial resources by the measures and other financial indicators that we were able to obtain such as average investments, amounts by regions-cantons of Federation of Bosnia and Herzegovina (table 1). Total budget in FB&H for agriculture in 2008 was 52.650.000KM, where rural development budget was 6.512.000 KM or 12,40% of total budget for agruclture in FB&H.

*Table 1. Review of all cash support for measures of rural development by cantons and the types of projects in in 2008.*

| COUNTY/ CANTONS | | D/1-1 | D/1-2 | Increase in agricultural areas in 2007 | D/2-1 | D/2-2 | D/3-1 | D/3-2 | D/4-1 | D/4-2 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| USC | KM | 80.545 | 82.714 | 155..910 | 11.577 | 32.681 | 20.851 | 80.724 | 30.859 | 0 | 495.860 |
| | % | 8.1 | 16.5 | 14.2 | 1.2 | 10.9 | 6,7 | 6.7 | 2.9 | 0.0 | 7.6 |
| PC | KM | 136.006 | 16.770 | 343.690 | 0 | 0 | 6.016 | 61.875 | 14.353 | 0 | 578.709 |
| | % | 13.6 | 3.4 | 31.2 | 0.00 | 0.0 | 1.9 | 5.2 | 1.3 | 0.0 | 8.9 |
| TC | KM | 122.041 | 32.261 | 374.820 | 4.175 | 9.840 | 14.023 | 120.450 | 168.102 | 0 | 845.712 |
| | % | 12.2 | 6.5 | 34.1 | 0.4 | 3.3 | 4.5 | 10.0 | 15.8 | 0.0 | 13.0 |
| ZDC | KM | 137.442 | 50.403 | 98.080 | 86.777 | 21.924 | 49.223 | 104.735 | 23.317 | 0 | 571.901 |
| | % | 13.7 | 10.1 | 8.9 | 8.7 | 7.3 | 15.8 | 8.7 | 2.2 | 0.0 | 8.8 |
| BPC | KM | 112.651 | 28.033 | 19.600 | 25.383 | 0 | 4.959 | 41.250 | 23.622 | 0 | 255.498 |
| | % | 11.3 | 5.6 | 1.8 | 2.5 | 0.0 | 1.6 | 3.4 | 2.2 | 0.0 | 3.9 |
| SBC | KM | 162.153 | 75.146 | 37.880 | 286.189 | 25.054 | 19.673 | 241.072 | 278.347 | 0 | 1.125.514 |
| | % | 16.2 | 15.0 | 3.4 | 28.6 | 8.4 | 6.3 | 20.1 | 26.1 | 0.0 | 17.3 |
| HNC | KM | 89.323 | 73.476 | 21.880 | 140.485 | 35.489 | 58.043 | 55.160 | 222.460 | 13.717 | 710.032 |
| | % | 8.9 | 14.7 | 2.0 | 14.0 | 11.8 | 18.6 | 4.6 | 20.9 | 38.7 | 10.9 |
| ZHC | KM | 25.962 | 33.754 | 0 | 35.014 | 20.443 | 50.564 | 388.774 | 130.761 | 8.636 | 693.908 |
| | % | 2.6 | 6.8 | 0.00 | 3.5 | 6.8 | 16.2 | 32.4 | 12.3 | 24.4 | 10.7 |
| KS | KM | 47.375 | 38.301 | 9.480 | 109.029 | 154.569 | 59.791 | 28.790 | 157.937 | 13.056 | 618.327 |
| | % | 4.7 | 7.7 | 0.9 | 10.9 | 51.5 | 19.2 | 2.4 | 14.8 | 36.9 | 9.5 |
| K10 | KM | 86.503 | 69.141 | 38.660 | 301.371 | 0 | 28.859 | 77.171 | 14.834 | 0 | 616.539 |
| | % | 8.7 | 13.8 | 3.5 | 30.1 | 0.0 | 9.2 | 6.4 | 1.4 | 0.0 | 9.5 |
| TOTAL | KM | 1.000.000 | 500.000 | 1.000.000 | 1.000.000 | 300.000 | 312.000 | 1.200.00 | 1.064.592 | 35.408 | 6.512.000 |
| | % | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

*Source: Federal Ministry of Agriculture, Water and Forestry*

It is indubitable that above mentioned measures had great impact on particular areas of intervention through increase of agricultural production, employment, diversification and economic activities. It is important say that huge unused resources exist in this area, because there were numerous project proposals by the applicants. That shows strong interest for changing the current position and resolving numerous questions of abandoned villages, which was the legacy from previous times. Table 2 shows measure of rural development by the groups of project in 2008.

*Table 2. Review of rural development measures in 2008. by the number of approved projects and funds*

| Mark | Name of the measures for rural development | Number of projects | Support the (BAM) | Participation In % |
|---|---|---|---|---|
| D/1-1 | Investments in agricultural farms | 637 | 1.000.000 | 15..4 |
| D/1-2 | Support for young farmers | 202 | 500.000 | 7.7 |
| D/1-3 | Increase in agricultural areas in 2007 | 314 | 1.100.000 | 16-8 |
| D/2-1 | Support areas with difficult conditions for life | 275 | 1.000.000 | 15.4 |
| D/2-2 | Organic farming | 71 | 300.000 | 4.6 |
| D/3-1 | Complementary activities | 112 | 312.000 | 4.8 |
| D/3-2 | Investments in rural infrastructure | 168 | 1.200.000 | 18.5 |
| D/4-1 and D/4-2 | Management and protection of farmland | 226 | 1.100.00 | 16.8 |
| Total | - | 2005 | 6.512.000 | 100 |

*Source: Federal Ministry of Agriculture, Water and Forestry*

Measures of rural development were realized in several directions despite of lack of financial resources. Most of the resources were invested in landscaping and increasing of agricultural land, and areas with harder condition for agriculture, rural infrastructure, and also support for young farmers.

## Conclusion

During second half of 20th century, rural area of Federation of Bosnia and Herzegovina was shaped on paradigm of city- village confrontation, industrialization and de-agrarization, public and private ownership, big agricultural households and small agricultural households.

Rural development policy therefore, has to lead towards several basic criteria's: territorial approach instead of sector approach, stirring networking and forming cooperative relationships, concentrating on collective efficiency instead on individual, multi-sector approach to integral development, stirring development "down" on endogenous resources, preserving local identity and social capital, stirring innovation and promoting completion with quality instead with quantity.

Concept of multifunctional presumes model to achieve growing sustainability by assuring non marketable public goods in agriculture and rural area. Concept of

multifunctional in agriculture is connected to the market production by diversification of activity of multifunctional agricultural household, and in rural area it is connected to doing multifunctional activities of agricultural producers and other participants in rural economy independently from agricultural production.

It is indubitable that above mentioned measures had great impact on particular areas of intervention through increase of agricultural production, employment, diversification and economic activities of farmers in Federation of Bosnia and Herzegovina.

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# BLOCKAGES IN THE ROMANIAN FARMERS' PERFORMANCE

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## Abstract

*The main factors that obstruct the best use of farmers' productive potential are investigated and on this basis certain possibilities to surmount the present situation are highlighted.*

**Key words**: *agriculture, competitiveness, productivity, modalities to increase the competitive potential*

## Introduction

In spite of the significant agricultural potential provided by the natural resources, the farmers' performance in Romania in relation to the efficiency of resources allocation is quite poor in the European context [5].
The causes of this unfavourable situation are found both in the evolution of Romanian agriculture throughout history and mainly in the modality in which the specific policies have been designed and promoted after 1990.

## Determinants of low performance

*An atypical agrarian structure in the European context.*

After 1990, in Romania's agriculture, a land ownership and land use structure was created that featured a strong bipolar character. Out of about 4 million agricultural holdings that exist in Romania, the individual agricultural holdings (peasant household farms) account for 99.5%. Overall, the individual agricultural holdings operate 65.2% of the utilized agricultural area in Romania. The average agricultural land area per individual agricultural holding is 2.34 ha. At the opposite pole, we can find the legal

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entity farms, representing 0.5% of the total number of agricultural holdings, which operate 34.8% of the utilized agricultural area. The average size of a legal entity farm, as utilized agricultural area, is 275.37 ha.

The defining characteristic of the individual agricultural holdings is the poor technical endowment and the excessive landed property fragmentation. The agricultural holdings with less than 1 ha of land account for 43.91% of the total number of individual agricultural holdings, yet they represent only 7.24% of total utilized agricultural area. As regards the share in total individual agricultural holdings, the agricultural holdings with 1-5 ha have a top position: 45.97% of total individual agricultural holdings, i.e. 46.52% of total utilized agricultural from this farming sector. The agricultural holdings with a land area comparable to the average area of a professional family farm in most EU Member States (20 ha and over) represent only 0.55% of total individual agricultural holdings in our country, accounting for about 14% of the total land area operated by the individual agricultural holdings in our country.

The property fragmentation process on the individual agricultural holdings can be also found in the livestock sector. The average number of animals per individual agricultural holding is: 2.45 bovines, 2.04 pigs, 21.36 sheep, etc.

Most individual agricultural holdings in Romania base their activity on their own labour resources. There are 1.63 persons on an individual agricultural holding on the average. The individual agricultural holdings that hired labour account for less than one-third of total individual agricultural holdings: 1,111,639 agricultural holdings (28.4% of total individual agricultural holdings) [8, p.154].

The high land fragmentation leads to the chronic under-utilization of labour resources. On the average 136.7 days/year were worked on an individual agricultural holding. If the number of persons existing on an agricultural holding (i.e. 1.63 persons) is taken into consideration, it results that a peasant farmer works 84 days/year on the average, which is a much lower level compared to the available time each year [7, 8].

As regards the economic activity, most individual agricultural holdings are mainly oriented to self-subsistence. In more than 80% (83.2%) of the individual agricultural holdings – which operate 66.3% of the UAA in Romania – 50% of the obtained agricultural production goes to self-consumption [8; 10]. This situation is also confirmed by the income structure on the farmers' households. In the total monthly income of farmers' households, which is quite close to the level of incomes of less-favoured social categories, such as the families of pensioners (the income of the farmer family is by only 6.1% higher) or to the unemployed family (farmer income is by 12.8% higher), the self-consumption of agrifood products has a significant contribution. The share of self-consumption is about 47% (46.9% more exactly) of total incomes on farmers' households. At the same time, the sales of agri-food products, the part of agrifood products that enters the market flow contributes by only 13.8% to the formation of the total income of farmers' households [9].

The high share of self-consumption on the individual agricultural holdings

clearly reveals a low insertion level of these economic entities into the specific market flows and circuits. In the last instance, the revealed situation could be interpreted as a failure of markets in the case of small farmers.

*An unfavorable competitive environment*

An under-developed competitive development, strongly distorted to the disadvantage of farmers, has developed in rural Romania in time [2]. The persistence of this undesired situation is the result of the following factors:

*Maintaining obstructed communication channels between the supply and demand* - In frequent cases, either the demand does not reach a large number of farmers, mainly the peasant household farms, or the farmers are not able to receive it as they should. As a result, the signals issued through the market action are weak and sometimes distorted. Under this general background, we can also notice a certain information asymmetry that is manifested in the favour of carriers of the demand of agri-food products and of agricultural enterprises that by their economic potential are favoured as compared to the large number of peasant household farms.

At the level of farm management, the result is the low efficiency in the allocation of resources, which inevitably impacts the productivity and competitiveness of Romanian farmers and agricultural products implicitly.

*A strong disequilibrium existing in the competitive potential between the carriers of demand and the carriers of supply* - The excessive land and operating capital fragmentation lie at the basis of a strong disequilibrium as regards the competitive potential of the supply carriers versus the demand carriers. The above-mentioned disequilibrium has been and is still fed by the lack of supply organization: the scarcity of the marketing cooperatives as well as of the agricultural producers' groups continues in Romania's agriculture. The distributive function of markets is distorted in the favour of demand carriers. The unjustified transfer of newly created value from the agricultural sector through the intermediary of prices drastically obstruct the market function as stimulant of savings in the area of agricultural producers, with well-known effects upon the dynamics of the farmers' competitive potential. This adds to the severe rural poverty, which can be noticed on a large scale.

*A credit market that is practically blocked* - mainly for the large number of individual peasant farmers. Out of different reasons, among which the high transaction costs stand out, the credit market in the Romanian rural area does not fulfill its role of institutional infrastructure that is absolutely necessary in ensuring the financial base of agricultural producers.

The consequences of financial credit market blockage upon the competitiveness of Romanian agricultural products and farmers can be felt at two levels:

- on the short term by the decrease of average yields in the absence of necessary resources for the use of adequate inputs as well as by the increase of costs generated by the interest rate explosion;

- on the medium and long term, by the drastic restriction, in certain cases even annulment of the structural adjustment measures in the rural economy.

*Institutional environment crisis*

This undesired situation is most pregnant in the rural market area. In the competitive environment area, the institutional crisis essence is represented by the contradiction between the institutions that regulate the behavior of market operators and the mechanisms "imposing" the observance of these norms.

Due to the large scale of the revealed contradiction, the confidence level in the mutual relations between the agricultural producers, as well as between these and the demand carriers is quite low. As one of the consequences of this situation, the supply organization level continues to be quasi nonexistent on most agricultural markets in our country. At the same time, the contractual relations on medium and long term are still low developed [1; 3]. Another consequence and at the same time expression of the institutional crisis is represented by the increase of different opportunistic behavior forms. Both in the case of demand carriers and in the case of supply carriers, the breaking of assumed promises represents a common practice, without too great penalization risks. This type of behaviour adds to the risk and uncertainty situations in which the rural market operators have to carry out their activity. As a result, the transaction costs, which are already significant due to the excessive supply fragmentation, are high; this high transaction costs determine many agricultural producers to turn to occasional market relations, while the demand carriers are oriented to imports. One of the most serious negative consequences deriving from the persistence of the institutional crisis is represented by the incomplete utilization by the agricultural producers of the advantages provided by the private ownership right. One should not overlook the possible negative effects generated by the farmers' lack of confidence in the market institutions (mainly contractual relations) for the sale of production, for attracting the necessary resources for economic activity consolidation respectively.

## Possible evolutions

The economic consolidation of the Romanian agricultural producers brings into prominence the need to promote certain actions in order to facilitate the development and extension of structural reforms [6] in the agricultural sector, along two main directions: the enterprise reform and in this context the land and operating capital concentration; creation and development of competitive markets in the Romanian rural area.

The analysis and evaluation of existing constraints and blockages on the rural markets in our country suggest certain priority directions of action: supply organization, demand demonopolization, unblocking the connections between the demand carriers and the supply carriers, institutional crisis attenuation, etc.

In the supply area, as it has been already revealed, the existing problems are generated by the strong fragmentation of property and/or of capital operating modality, which continue to be the dominant characteristic of the Romanian agriculture. The modalities to surmount the present

difficult situation envisage the increase of the concentration level of agricultural production and/or – according to the case – of its commercialization. In this area, there are well-known solutions: capital concentration into competitive and viable farm units in an open economy; development of contract-based agriculture and of integration relations between the farm units, mainly on cooperation basis. In this context, the problem that is raised has in view the reasons why the above-mentioned solutions have not been successful and what perspectives might exist for the structural adjustment process acceleration in the future.

The modest results in capital concentration, in land concentration in particular, are determined by objective causes as well as subjective causes mainly connected to the agricultural and rural development policies. The objective causes derive from the limited level of budgetary resources that could be released by Romania's agriculture in different periods for supporting the rural economy. Yet it is under this framework that debatable economic policy decisions intervened. In the first place we have in view the propensity for the present moment to the detriment of the future. The budgetary resources have been and still are allocated without taking into sufficient consideration the problems of farm consolidation and production sale, of creating the necessary material and institutional premises for the creation of competitive markets as one of the determinants of farmers' competitiveness. In the second place, as one of the causes of the slow evolution of capital concentration into competitive agricultural units resulting into the creation of favourable conditions for supply organization, we should mention the attempt to solve up the problem without taking into consideration the effects that are generated by the existence of strong barriers in the downstream sector. These are determined by multiple causes, among which the low diversification of economic activities in the Romanian rural area and the farmers' low educational and training level stand out [4]. A decisive impetus in the concentration of economic activities in agriculture might be provided by the increase of the share of budgetary allocations devoted to rural development, mainly to the diversification of economic activities through the creation of necessary conditions for stimulating the establishment of SMEs of different profiles in the rural areas.

The rural cooperation in the marketing area is found in a similar situation. This segment of the Romanian agriculture is constrained by the scarcity of resources for the establishment of the production conditioning, storage and marketing infrastructure, on one hand; on the other hand, by the low level of farmers' confidence and by the high transaction costs.

The high transaction costs represent an overall constraint to the Romanian farmers' competitiveness.

The diminution of transaction costs will be possible as a result of progress experienced along two levels, apparently separated, namely: the process of land and operating capital concentration; attenuation and gradual surmounting of the crisis of agricultural markets as main institution of the economic system. At this latter level, we have in view the promotion by the governmental action management of certain measures meant to lead to the establishment and development of long-lasting relations between the demand and supply carriers, through the

development of integration relations inclusively, and on this basis the consolidation of mutual confidence between the market operators with all the favourable results of this process. In this sense, it is also worth mentioning the need to promote certain actions in the legal and institutional infrastructure areas meant to guarantee the observance of the law.

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UDK: 330.322:631

# THE INVESTMENTS STIMULATION IN AGRICULTURAL AND RURAL INFRASTRUCTURE

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*"The world must invest 83 billion dollars annually in agriculture in developing countries to be able to feed 9.1 billion people in 2050, estimated the United Nations Food and Agriculture."*

*FAO report on the forumm how will be fed world in 2050, the period 12-13 October 2009 in Rome.*

## *Abstract*

*The paper analyzes the investments evolution in Romanian agriculture between 2006 -2009 and their economic efficiency, and the tendency of the promoted policies by international organizations in the field in the next period. There are presented also national and community programs that promote measures to stimulate investment process in the countryside. In the actual global and national macroeconomic context it is necessary to adapt the existing policies and mechanisms to stimulate investment in agriculture to rural needs and realities.*

***Key words:*** *investments, agriculture, subsidies, rural*

## Introduction

"Investments should be targeted for agricultural and animal production, and to support services such as refrigeration plants, storage facilities and market infrastructure," said FAO in a report published in October 2009 in Rome. The investment plans include 20 billion dollars per year for agricultural production and $ 13 billion per year for livestock production. In addition, another 50 billion dollars a year are required for downstream to obtain an increase of 70 percent of world agricultural production until 2050. "What is essential for these investments will come from the private sector, also by purchasing equipment and machinery to farmers and companies investing in processing plants, recalling the FAO estimates that" public funds will also be necessary to improve the functioning of the agricultural systems increase food

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security". According to FAO, "the priority sectors for public investment should be research, development, major infrastructure such as roads, ports and energy and agricultural institutions and services for education, health, water supply and health care.

## Materials and Methods

Research methodology is based on a multidisciplinary approach to generating advanced environmental, economic, social technics. Materials for study are drawn from professional literature and national and international practice. All the results and conclusions will have a particularly unique, but may be applied by all entities.

## Results and Discussions

Rural areas in Romania covers 87.1% of the country, comprising 45.1% of the population (approx. 9.7 million) with average 2.4 ha per farm. Currently, subsistence farms and semi-subsistence covers 45% of utilized agricultural area of Romania, representing 91% of the total number of farms and the majority of the workforce is employed in agriculture. In this context, stability budget for agriculture has a significant social role for these rural areas, while ensuring support for economic development. Although Romania has generally been a target of foreign direct investment by 2009, international crisis affected primarily the least developed sectors of the economy as agriculture. This sector is crucial for the improvement of the macroeconomic indicators such as inflation, food, Romania having the largest share in the consumer basket (over 37% compared with 15% in the euro area).

Currently, Romania is affected by international economic crisis, foreign direct investment and the changing trend and the changing situation of agriculture is more pressing in the current financial crisis.

*Table 1 - Investments in economy and agriculture, in RON million in current prices*

| Indicator | UM | 2006 | 2007 | 2008 | 2009* |
|---|---|---|---|---|---|
| Total investments, which: | RON million | 72891 | 98417,7 | 90084,4 | 62507,6 |
| Investments in agriculture | RON million | 3843,6 | 3312,6 | 4053,8 | 1750,2 |
| % investment in agriculture from total investments | % | 5,3 | 3,4 | 4,5 | 2,8 |
| Total gross added value/ Total investments | RON | 4,2 | 3,7 | 5.0 | 1,8 |
| Gross added value in agriculture/ Investments in agriculture | RON | 7,0 | 7,1 | 8,0 | 18,3 |

*Source: Anuarul statistic al României 2007-2008, Prognoza noiembrie 2009 - Comisia Națională de Prognoză,*

In 2007-2009, the share of the investment in agriculture in total investments in the economy ranged from 3.4% in 2007 and 4.5% in 2008, registering the lowest level in 2009 - 2.8%. First year after accession marked a negative record of investment in agriculture due to weaker investment financed by SAPARD program and delays in approving the National Programme for Rural Development. Investments in agriculture have seen a downward process in 2007, both in absolute terms and as share of total investment, due to weaker investment by SAPARD and delays related to approval of the National Rural Development Programme (NRDP).

In 2009, total net investment fell to 30.6% compared with 2008, those in agriculture declined from 50% in real terms. A measure of investment in agriculture can be considered the ratio of gross value added in the economy and investments, except that investments are only one factor of production that contribute to economic growth. In economic branches such as agriculture, information value of the indicator is relatively limited because agricultural production depends on many factors, including climatic conditions first.

Analyzing the data presented in the table above shows that the economic efficiency of investment in agriculture has been above average on the national economy during 2006-2009 but with large swings from year to year.

Low investment requirements do not provide technical and technological modernization of the agriculture, are lower than the contribution of the agriculture to the national economic development and reducing disparities ensure productivity than most European Union Member States.

Extremely limited domestic sources for investment financing entails the need to attract foreign investment and access to funds.

To finance or co-investments for agricultural development, environmental preservation and rural development measures can be accessed from the National Rural Development Programme.

Regional development policy, rural development policy and coordination of structural instruments can contribute to the agricultural development by funding from future structural instruments and applying the National Development Plan for the period 2007-2013. National Rural Development Programme 2007-2013 aims at developing a competitive agriculture and forestry sector based on knowledge and private initiative, able to adapt to long-term change, which takes into account the Community rules, preserve the environment and enhances the processing sector. It is devoted to the following key objectives:

- Facilitating the transformation and modernization of the current dual structure of agriculture and forestry and related processing industries, to make them more competitive and contribute to the economic growth and income convergence in the countryside (where possible), while ensuring living conditions and environment in these areas;
- Maintain and improve environmental quality in Romania's rural areas by promoting sustainable management both on farmland and on the forest;
- Manage and facilitate the transition of the agricultural labor to other sectors to ensure

adequate living standards of socially and economically;
- Improve professional skills and provision of advisory services to farmers and forest owners to increase management capacity in dealing with a new environment;
- Continuing the restructuring and development of the farms, especially semi-subsistence farms, and agricultural and forestry products more competitive.

Table 2 - Community allocation for the entire period

| Priority axis | EU contribution | National contribution | Total program financing | Cofinancing EU rate (%) |
|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 5 |
| Axis 1 | 3.173.849.264 | 793.462.317 | 3.967.311.581 | 80,00 |
| Axis 2 | 1.880.598.967 | 412.814.408 | 2.293.413.375 | 82,00 |
| Axis 3 | 1.978.991.904 | 494.747.976 | 2.473.739.880 | 80,00 |
| Axis 4 | 188.059.896 | 47.014.975 | 235.074.871 | 80,00 |
| Technical assistance | 300.895.834 | 75.223.959 | 376.119.793 | 80,00 |
| Complementary direct payments | 500.108.880 | 125.027.220 | 625.136.100 | 80,00 |
| **Total** | **8.022.504.745** | **1.948.290.855** | **9.970.795.600** | **80,46** |

*Source: MADR*

The number of the projects submitted nationally consistent, (December 24, 2009) is 21,531 with a value of 10.4 billion euros, of which 9591 were selected for funding public projects worth 1.9 billion euros. Amount paid for contracted projects approved support of applications is 629.8 million euros.

Thus, funds associated with Axis 1 of NRDP were supplemented with 45,884,333 euros, the largest increase in funds that about 22.9 million euros, is designed to measure 121 - Modernisation of agricultural holdings. Also, the amount allocated to Axis 2, measure 214 - agri-environmental payments "has been increased by 27,203,145 euros, and increased spending on three axis with 28,606,522 euros.

To meet priorities and local conditions and regional economic situation data, Romania has provided:

- Up to 45% (over 3 billion) from the EAFRD funds for improving competitiveness of the agriculture and forestry (Axis 1), namely: improving the skills of farmers and persons engaged in the forestry sector, enabling a more efficient management of holdings Agricultural and forestry and ensuring proper processing of semi-subsistence farms, improve the competitiveness of the commercial farms and semi-subsistence, restructuring and modernization of processing and marketing agricultural and forestry products;
- 25% (2 billion) for environmental improvement and rural areas through sustainable use of agricultural land and forestry (Axis 2). These funds will help to: ensure continued agricultural land use, conservation and improvement of habitats and natural resources, promoting sustainable management of the forest land;
- 27.5% (nearly 2 billion) for quality of life in rural areas and diversify the rural economy (Axis 3) to: maintain and develop economic activities to increase employment

opportunities, increase the attractiveness of rural areas, skills and support organization actors around local projects;
- 2.5% will be allocated for the launch and operation of local initiatives through the LEADER approach to promote the endogenous potential of the territory and for improving local governance.
Investment aid has undergone a great extent in 2006, because farmers loans for project finance SAPARD Programme Farmer, following a strong downward trend upward in 2007 and during 2008 to 2009.

*Table 3 - Structure of budget support in agriculture in the period 2007-2009, in (RON million) current prices*

| Budget support | Realised in 2007 | Realised in 2008 | Preliminary execution in 2009 |
|---|---|---|---|
| Market measures | 20,8% | 19,4% | 29,6% |
| Decouplet payments | 27,0% | 22,8% | 18,1% |
| Input subsidies | 38,5% | 27,0% | 14,8% |
| Investments | 13,4% | 30,8% | 37,5% |
| Total | 3586,5 | 4380,5 | 3865,4 |

*Source: MADR.*

In 2007, the investment grants focused investments in the vineyard conversion to Fund lending and investment in agriculture through farmer program, financing rural credit guarantee fund and co-financed under SAPARD projects. Between 2008 and 2009 were subsidized retraining investments in the vineyard and Farmer program and was financed projects under the SAPARD program and the EAFRD. Although the 2009-2012 Government Program provides a series of measures to stimulate investment process in the rural economy, so far they have not been promoted or adapted to global and national macroeconomic context. 2010 budget money available to fund state aid to be granted to farmers in 2010 is only 0.21 billion RON, the total amount insufficient to the Romanian agriculture needs in a year in which Romania is in economic crisis.

At the same time it seems that, since 2010, state aid for agriculture will be granted only by holding, but specific legislation aligned to EU requirements was not fully completed. Under the current project, State aid will be granted to agricultural holdings investments, conservation, construction and transfer of ownership of the traditional farm buildings to the state.

At this point it is clear that performance of agriculture and consequently rural economy will not improve significantly in coming years without the support of foreign investment. The high degree of fragmentation of the agricultural land, low investment, and an aging population living in poor material circumstances largely on subsistence bring Romanian agriculture before a single major options-European funds and foreign direct investment.

The low price of arable land and agricultural development potential starting to attract massive investment from European funds and private equity, which is the only

chance for the sector.

Financial and economic crisis calls into question with greater acuity problem of absorption of EU funds in the context of the dramatic restriction of credit and reducing the volume of foreign direct investment. Thus, an optimum absorption capacity, at least for the next two years, the most important support to counter the crisis.

"It's good to have foreign investment, diversified activities, but the agricultural potential of the Romanian and European funding opportunity, it is best to focus on them," said Mr. Radu Ghetea, head of CEC Bank.

Considering that all Romania's development regions covered by Objective 1 funded, there is a huge potential to link the funding received about 13 billion common agricultural policy with the 19 billion received by the Regional Policy to promote and support strategies integrated rural development.

## Conclusions

Measures to stimulate foreign investment and increasing the absorption of EU funds to finance investment in rural areas should:

- ensuring significant involvement of the local beneficiaries for sustainable development to achieve a flexible, progressive and responsive to local needs;
- to place the interests of farmers and rural people in the central development programs so that mechanisms based on the central institutions in determining the size and distribution of funds to consider regional workforce needs;
- implement a flexible policy creation or strengthening of institutions, with horizontal and vertical ties of partnership between various institutions responsible for rural development policies;
- to promote a development process and adapted based on local circumstances, which combine harmoniously with regional and global policies that take into account the economic, environmental and social aspects of rural development.

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Economics of agriculture
SI – 2
UDK: 347.733:637.1 (497.11)

# MONOPOLY, GOVERNMENT POLICY AND MILK SHORTAGE IN SERBIA

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## Resume

*The ownership concentration in the processing of fresh milk sector in Serbia, together with a considerable dispersion and fragmentation of the primary production of raw cow's milk has led to insufficient supply and lack of basic dairy products on the market. The shortage phenomena is manifested in the circumstances of depressed and economically unsustainable low prices of production inputs – raw milk, and quantity decrease, accompanied by changes in the structure of the milk products final production.*

*Over the past five years, the Serbian government has led the wrong economic policy of the milk primary production incentives, and thus, the breeding of milk cows. Additionally, the poor economic policy was conducted in the area of ownership structure changes and incentives for the development of new production facilities for the processing of fresh milk for the Serbian market necessities.*

***Key words**: monopoly, market imbalance, prices growth, insufficient production, and processing.*

## Introduction

The economic cycles in certain industries, particularly in agriculture, due to the effects of market principles acting on profit maximizing, as well as by wicked economical policy, causes the shortage of goods. The insufficient good supply, in this case cooking oil and milk in Serbia was manifested in the second half of 2010. The expressed explanation for this shortage was the existence or action of monopoly in this sector of agro-production. The question is whether this is really so, that is, if the existence of a dominant market participant in processing of raw milk is the only cause of the lack of market supply.

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In the paper we tried to point out the errors in economic policy incentives for cattle breeding, that is milked cows, and the impact of purchase prices of row materials on market trends. In this paper, we presented some of key quantitative production indicators, number of cattle for the period of 10 years, as well as the nominal movement of purchase prices of row cow's milk and movement of premium for milk production in last five years. The Government economic policies was focused on support of enlarging the dairy sector through the privatization process of social dairies and their ownership concentration, on the one side, and on reduce of incentives for raw cow's milk production, on the other side. The economic policy is based on the assumption of the perfect market impact on the use of available resources in agriculture, and that the market will perfectly influence both the production of quantities of goods, and the formation of their prices, all together aiming to achieve the social optimum. The current cycle of shortage or reduced supply and solving the lack of the required quantities by importing the milk, shows that the market is not the perfect regulating mean of arranging the supply and demand relationship. The insufficient market milk supply is caused by a reduction in supply and purchase of raw milk for industrial processing due to the decline in production, and, for a long-term period manifested the low purchase prices of raw materials. The shortage of industry processed milk supply was the result of the reduction in the number of suppliers of key row cow milk's processors. Milk prices are formed freely and I n conditions of scarcity, the producers may increase the prices to the level of restrictive purchasing power, only meeting the demand in quantity and structure of those customers who have higher purchasing power. In this way, it is established a new, lower-volume production market equilibrium level, and the shortage is being eliminated. Therefore, the balance in the market can be achieved by reducing the offered quantities and increasing the price of finished products. Thus, the input producers purchase prices level for the primary raw cow milk's producers may remain unchanged. As described above, the companies from the industrial processing milk sectors can generate higher profits with lower productivity levels. The increase in imports of these goods will establish a new market equilibrium, but it will create negative consequences for Serbian economy, which affect their own primary production resources, the outflow of foreign exchange used for importing milk, and the reduction of domestic milk and dairy products consumption per capita.

The problem could be solved in a way that will increase use of domestic primary production resources, which will also provide the increase of domestic production and minimize the need to import milk and dairy products. Before the brief presentation of requirements for the better development of economic policy conduct in this sector, it should be recalled here the problem of some industry cycles, particularly the agricultural production that was long ago theoretically and analytically discussed. Alfred Marshall, a British economist[3] back in 19th century pointed out the problem of market imbalance presenting the example of pigs and corn production cycle. "If all the farmers, due to favorable relation between the pigs (pork) prices and the cost of their fattening (corn

3 A.Marshall (1842-1924), Professor of Economics, Cambridge (1885 – 1908).

prices)at about the same time decide to increase pigs production, as this will be the case in this example. If they all about the same time, come up with the increased pigs supply, it will cause a sudden fall in pork prices (increasing the corn price), which would force many farmers to reduce the production, creating again the favorable conditions which would consequently, lead to a new pig production increase"[4]. Something similar is really happening with the cycle of breeding cows and milk production. The economic policy of reducing incentives and the oscillations of the raw milk purchase prices in direction of their stagnation and decline, led this segment of agricultural production in declining cycle.

The positive economic policy would be the one that would have influenced the more favorable market outcomes, which means the maintaining and increasing production of fresh cow's milk in small and large agricultural farms in Serbia together with the stable subsidies policy and stimulation of competitive new processing capacities. The economic policy in Serbia, unfortunately, is not guided in the direction of alleviating severe market cycles.

## Competition

The simplified definition of competitive market comprises the market which, on the supply side and demand side, involves a large number of separate independent subjects that could affect the quantity of goods and services, on the supply side, while on the demand side does not individually influence the goods' and services' pricing. Thus, in a competitive market the prices and quantities, for each participant will appear as given, i.e. as independent of their individual will.

The monopolistic market structure means that on the supply or demand side there are few or only one participant that affects the quantity and prices of certain goods and services. The oligopoly structure and the formation of cartels imply the behavior on market's supply or demand side whereby more participants agreed on both, the quantity of goods and their prices.

The government, by its normative and regulatory organs affects the market behavior of the participants in order to protect competition. The process of establishing and proving a distortion of competition in the market, with a professional, legal, and, particularly economic aspect is very complex requiring a high level of technical and research skills and knowledge.

The complete information about the structure of production and processing of fresh cow's milk were available for the year 2006, as the reference year in which the production and processing fulfilled the market demand in Serbia.

4 Joseph Schumpeter, History od Economic Analysis, Volume 2, Informator Zagreb 1975, page 978.

*The total production, processing, and delivery of fresh cow milk with participants' structure in 2006.*

| | **Quantity liters** | **% participation** |
|---|---|---|
| Total production* | 1.587.000.000 | 100 |
| Total subsidized delivery** | 739.945.736 | 46,63 |
| - Danube Foods Group B.V | 350.374.975 | 22,08 |
| - 18 other dairy factories | 238.986.107 | 15,06 |
| - Other 188 dairy factories | 150.584.654 | 9,49 |
| Total non subsidized milk delivery and processing plus market sale | 254.000.000 | 16,00 |
| Other processing | 593.054.264 | 37,37 |

** Republic Statistical Agency data for 2006. Statistical Bulletin of the Agency 2008, page 219.*
*** Total subsidized delivery comprises only state's subsidized delivery.*

*Total production – sum of subsidized and non subsidized delivery in 2006*

| | **Qty. liters** | **% participation** |
|---|---|---|
| Total production* | 1.587.000.000 | 100 |
| Total subsidized and non subsidized delivery and processing | 1.004.000.000 | 63,26 |
| *- Danube Foods Group B.V*** | *350.374.975* | *34,90* |
| - 18 other dairy factories | *238.986.107* | *23,80* |
| - Other 188 dairy factories | *150.584.654* | *15,00* |
| Total non subsidized milk delivery and processing plus market sale | *264.054.264* | *26,30* |
| Other processing | 583.000.000 | 36,74 |

** Republic Statistical Agency data for 2006. Statistical Bulletin of the Agency 2008, page 219.*
** * Participation in total subsidized delivery.*

According to dairy factories jointed in the Danube Foods Group *B.V* participated in total subsidized and subsidized delivery with 34.90%, while their total delivery related to the total production is 23.41%.

*Total number of subsidized producers and the number of producers delivering fresh cow milk to the DF Group in 2006.*

| | | **% participation** |
|---|---|---|
| Total number of producers | 62.679 | 100 |
| Danube Foods Group B.V | 18.956 | 30,24 |
| - Imlek (N.Sad, Zaječar, Zemun) | 16.835 | 26,86 |
| - Mlekara Subotica | 2.121 | 3,38 |
| Other producers | 43.723 | 69,76 |

According to the presented tables, the conclusion is that from the 62,679 producers, only 18,956, or 30.24% delivered milk to the DF Group dairies, and 43,723 manufacturers, or 69.76% supplied milk to other customers, or dairies.
Therefore, during those four years prior to the milk shortage, the market of primary products noticed the expressed competition of small and medium-sized cow milk primary producers. The processing sector is characterized by considerable concentration, because one Group has occupied nearly 35% of processing capacities, while other processors are fragmented with small processing capacities.

The tendency to monopolize the processing market is a main characteristic of a dominant processor in the final processing sector distinction. This trend noted one of the first theoreticians of monopoly, the French economist Antoine Augustine Cournot in the 19th century. He explains that…"a monopolist who operates several businesses will keep working only those companies which can produce on the most economical way, while competitive companies strive to facilitate production in all plants as long as their work can provide any kind of profit." This process was going on in Serbia in this dairy industry sector. The firms comprising significant market positions and equipment for processing a complete assortment of dairy products, in the last few years, have been detaining "peripheral" production capacities, focusing on the products that deliver the highest profit per unit. Certainly, it is one of the main causes of decreasing milk supply in the Serbian market in 2010.

## State Economic Policy

In the past five years, the government led the wrong economic policy in this sector. The first aspect of economic policy relied on the assumption that the privatization of the dairy industry in Serbia would lead to market competition, and therefore to the market equilibrium and to the balanced supply and demand. Unfortunately, this assumption proved to be wrong. Privatization has led to competition weakening, due to incorrectly implemented privatization, which caused the crisis of milk plants in Kragujevac, Nis, Uzice, Pancevo, inducing the market position strengthening of the dairy group in possession of a foreign investment fund – Salford. Another aspect of the wrong economic policy in this sector lies in ignoring the structure of raw material base production. Namely it was ignored the fact that in the total mass of raw milk in Serbia, dominant are small

and very fragmented farms, i.e. small family households. Policy of subsidizing producers kept changing, and in the period 2005-2009, the state permanently kept decreasing the premiums amount paid per liter of fresh cow's milk. From 2005 until the year 2008 the premium for the fresh milk delivered to for industrial processing have declined from 4,5 dinars for a production in hilly and mountainous area to 2.40, while for the plain area production it decreased from 3.8 to 1.4 dinars per liter.

*Premiums for the milk delivery in Serbia 2005-2009 (dinars per liter)*

| | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|
| Hilly and mountains regions | 4,5 | 4,0 | 3,0 | 2,40 | |
| Plane regions | 3,8 | 3,0 | 2,0 | 1,40 | |
| For E class milk | | | | | 2,0 |
| For 1. class milk | | | | | 1,0 |

Drastic deterioration in the position of small raw milk producers occurred in 2009, when they were introduced the criteria of subsidizing only E-extra class, and I – First class milk, and the quarterly quantities of not less than 2,500 liters of milk per producer. This means that the subsidies include only individual producers who deliver annually not less than 10,000 liters of milk. In this way are discriminated all the small farmers who own less than 5 milking cows, because the average production per cow on small farms in Serbia is slightly less than 2,000 liters. Such a policy, together wit a policy of low purchase prices, led to a drastic reduction of cows and considerable decreasing trends of milk production in Serbia.

## Purchase price of fresh cow' milk

The average annual purchase prices of fresh milk in Serbia, in the period 2000-2009 was increasing since 2007, and after that year, that is, in the last two years have noticed a drastic drop in prices.

*The average annual price of fresh cow's milk in the period 2000-2009.*

| | din/lit | Euro cent/lit |
|---|---|---|
| 2000 | 5,13 | 10,26 |
| 2001 | 10,95 | 18,42 |
| 2002 | 10,61 | 17,49 |
| 2003 | 10,85 | 16,68 |
| 2004 | 12,72 | 17,53 |
| 2005 | 14,21 | 17,16 |
| 2006 | 15,18 | 18,03 |
| 2007 | 35,33 | 44,17 |
| 2008 | 23,70 | 29,09 |
| 2009 | 22,00 | 23,85 |

*Source: Own calculation based on RSO data base and the data presented by the Ministry of Agriculture of the Republic of Serbia.*

The average purchase price, expressed in Euro cents is calculated based on an average rate of the dinar against the Euro. The presentation of prices in Euro cents is *de facto* deformed by overvalued dinar exchange rate against the Euro.
Graphic presentation of the purchase prices trends clearly indicates the breakpoint that occurred after 2007, which was affecting the reduction of livestock and number of milking cows in Serbia in the observed period.

## Production of raw cow milk and number of cows

Milk production in Serbia recorded growth until 2005, and decline after that period. Data presented in the table below provide a serial overview for the period 2000-2009.

*Production of fresh cow's milk in Serbia*

| Year | Total | | |
|---|---|---|---|
| | Million liter | Growth Rate | Index |
| 2000 | 1.567 | | 100 |
| 2001 | 1.576 | 1% | 101 |
| 2002 | 1.580 | 0% | 101 |
| 2003 | 1.577 | 0% | 101 |
| 2004 | 1.579 | 0% | 101 |
| 2005 | 1.602 | 1% | 102 |
| 2006 | 1.587 | -1% | 101 |
| 2007 | 1.549 | -2% | 99 |
| 2008 | 1.534 | -1% | 98 |
| 2009 | 1.478 | -4% | 94 |

*Data source: Republic Statistical Agency.*

If taken as a base year 2000 – with the index 100, the presented table shows that the milk production declined in 2009 to 94 index points. In absolute terms, milk production decreased from 1,567 million liters in 2000 to 1,478 million liters in 2009, or 89 million loiters. At the same time, farmers have reduced the supply of fresh milk for industrial processing. The number of milking cows and heifers also recorded a drastic fall.

*Number of milking cows and heifers in the period 2000-2009. (in Thousand)*

| | Total | index |
|---|---|---|
| 2000 | 843 | 100 |
| 2001 | 787 | 93 |
| 2002 | 752 | 89 |
| 2003 | 740 | 88 |
| 2004 | 742 | 88 |
| 2005 | 721 | 86 |
| 2006 | 674 | 80 |
| 2007 | 648 | 77 |
| 2008 | 614 | 73 |
| 2009 | 585 | 69 |

Number of cows in this period decreased from 843 thousand in 2000 at 585 thousand in 2009, or on index of 69. Such a drastic drop in the number of cows did not have so drastic consequences on the decline of the fresh cow's milk production, which means that the decline of animals was partly compensated by increasing productivity per head. Therefore, the milk production per cow from 1,859 liters in 2000 has increased in 2009 to 2526 liters per head.

## Conclusion

The economic policy in the field of primary agricultural production and processing based on expectations that the market itself would establish the optimal and socially acceptable balance, proved wrong.

The measures of government economic policy applied in this sector over the past five years have resulted in decreasing of production resources, both in primary production and in milk processing. Market disturbances in this sector due to long production cycle could establish the new balance fastest by balancing the supply and demand segments at the lower level increasing at the same time the products' prices whose shortage has been manifested. Missing offer of the agricultural products can be compensated by the import, but it could bring all the long-term negative consequences on the balance of payment together with considerable decrease of use and development of own production resources.

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Economics of agriculture
SI – 2
UDK: 332.1:631 (498)

# ROMANIAN AGRICULTURE IN THE CONTEXT OF NEW CAP PHILOSOPHY - APROACHES AND TENDENCIES

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## Abstract

*The approach of the economic role of agriculture in the new European context, implies understanding into a new vision of the mechanism of functioning of this complex system of activities that do not reduces himself only to the agricultural production and to the agro food industry, generally, but they have major implications for the employment, to the use of natural potential of each economy, especially in shaping the rural society, which has continued to hold a significant share in European economies. This paper aims to analyze some aspects in the evolution of the CAP to the Community level and influences that it has on Romanian agriculture.*
***Key words:*** *CAP, agricultural exploitation, direct intervention, SPUS*

## Introduction

In conditions of market economy, sustainable and competitive, the analysis of the role and the place of agriculture in the macroeconomic systems ensemble are considered as a "Sine qua non" condition for all those states who try to find ways for superior exploitation of their economic potential. Common Agricultural Policy harmonizes, at the European level, the agrarian interests of the states members, in shaping an efficient mechanism to capitalize the natural potential and to ensure food security through an important and varied agricultural production. The capitalization of agricultural potential through CAP has not offered significant results for increasing the competitivity in this sector, the significantly interventionism of this policy having as results a system who depends more on the financial support than on the capitalization of the potential. Referring to this aspect Luca (2009) says "*the fundamental interventionist*

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*nature of CAP has made that the initial intentions and the big goals to be frequently forgotten in the context of eternal bargains inter-governmental". The problem with a fully integrated European policy is that each country tends to be considered as a common stack from they need to grab as much. Is a form of prisoner's dilemma that the decision-making process of the CAP has never escaped*". Also do not need be ruled out direct intervention, for the consideration of an exaggerated liberalism, at least in the case of agriculture, the economic efficiency criteria should be, somewhere fined. Even in the case of CAP, the tools for supporting the agricultural production system through direct measures to support prices, establishment of production quotas or the granting refunds, are still applied, we are witnessing now to a new political orientation of the community policy especially to the rural development area. Once with economic integration in the EU, Romania, as part of the operating mechanism the CAP has to shape and adapt their national agricultural policy, of course, in accordance with the community practice, but considering the national specificities. It owns a significant share of agriculture in the national economy by mobilizing both natural resources but especially of the human resources impose an improvement of the national agricultural potential. In this context the addressing of the role and implications of agriculture on the national economies requires rethinking the entire operating mechanism. The steps to reform the CAP and of its transformation into a modern policy accounted for the European decidents a turning point in harmonization of intercommunity relations, especially as the financial sizes of the PAC hold a significant share in the EU budget and a new approach of the agricultural policy was more than necessary. So "*Over the past 15 years, the Common Agricultural Policy (CAP) has changed radically in response to pressures from European society and its evolving economy. The reforms from 2003-2004 has marked a new stage in this process, introducing the separation of direct payments via the Single Payment Scheme (SPS) in most sectors of the first pillar of the CAP and strengthening rural development policy, the second pillar of them.* (European Commission COM (2007) 722 final).

Common Agricultural Policy (CAP), the size and role it has in the European policies is a tool with major implications in shaping the European decisions space. The high degree of interest shown towards the implementation of financing mechanisms and functioning of the CAP resides from the complex character of European construction from 60s. Subsidizing the agricultural activity in the Community space was the main lever in raising the degree of coherence at the level of national agricultural communities of the Member States and for diversification of agricultural production. The Community intervention in agricultural field has been achieved but not on an economic needs stringent criteria, but rather for supporting the rural population in the first instance, for which the agriculture represent and the main form of income. Application of nearly six decades of a unitary agricultural policy at the level of entire Community space outlined the occurrence of an agricultural model, EU specific. We can thus say that the CAP is an integral part, inextricably linked to the communitarian agricultural model.

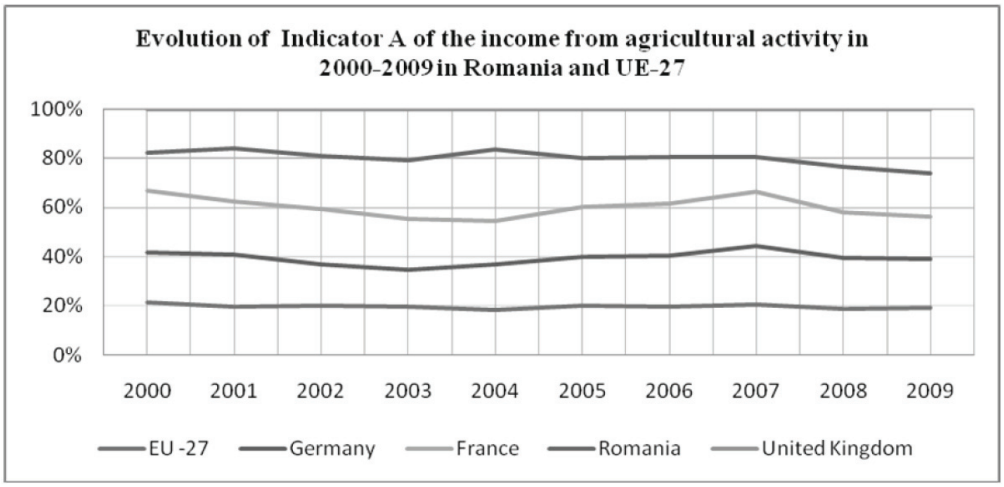
Simplifying the CAP represent both for the EU but especially so for Member States, where agriculture has a significant role in the all aspects of economic activity, a necessity springing from objective realities, especially since the application of this

policy require a bearish administrative mechanism and very resistant to change. All these measures have as effect improving the functioning CAP to the European level, but failed to reduce the divisions between member states regarding the future of this policy in the EU space, especially when it comes to funding them. Thus one of the first activities was aimed mainly the removal from the legal and the administrative community space of those documents considered to be obsolete in the application of the agricultural dimension of European policies. This steps continued with the drafting of a new and unique regulation of organization for the organization of the agricultural market called CMO Regulation (Regulation (EC) no. 1234/2007 establishing a common organization of agricultural markets and on specific provisions for certain agricultural products (OJ L 299, 16.11.2007, p. 1) which brought together all the 21 specific regulations in only one document much more flexible and easy to apply. Thus, as specified in one of a European Commission Communication to the European Parliament: "*Generally speaking, the adoption of the single CMO significantly reduced the number of regulatory acts of the CAP, which is henceforth regulated by only four legal documents, namely Regulation on direct payments, the single CMO Regulation, the Regulation on Rural Development and the Regulation on CAP financing*". (European Commission, COM (2009) 128 final).

Single payments system was also simplified and improved, especially following the adoption of the report on cross-compliance which envisages compliance with certain standards of environmental sustainability and environment respect of the agricultural producer who is thereby stimulated to produce environmental friendly.

## Romanian agriculture in the CAP

In this context the analysis of the role and place of the Romanian agriculture in the community agricultural space can be made in terms of two parameters that describe the ability of this branch to generate income and GVA. According to the methodology used by Eurostat in determining the *indicator A corresponds to the deflated (real) net value added at factor cost of agriculture, per total annual work unit and the implicit price index of GDP deflator is used as in this process.* In graph no.1 are presented the evolution of this A index for the period 2000-2009 at the level of EU-27 and in the case of the most powerful economies (Germany, France, UK), including its evolution in the case of Romanian agriculture. As you can see the evolution of this indicator describes a decrease in the value of this indicator for most presented economies. The last three-year period (2007-2009) describes a collapse in the value of this indicator. If we consider that the evolution of this indicator for the year 2007 coincides with a new budget and financing CAP period, when the European states were forced to give up the financing scheme on the surface, we can say that this situation is one of a cause of the trend indicator A.




*Source: own calculation based on EUROSTAT datasets, available at: http://epp.eurostat.ec.europa.eu/, retrieve on: 27.09.2010 and Europe in figures - Eurostat yearbook 2010*

The evolution of the indicator A is especially important for understanding the capability of agriculture to generate income. As can be seen from the evolution trend of this indicator, described in the chart no. at the level of EU-27 and of the three most performer economy at European level, recorded decreases in the level of this indicator. In terms of its evolution in the case of Romanian agriculture describes the same tendency at European level, but with a more pronounced decline than in the other economies. The evolution of this indicator in the case of France, known as "the main beneficiary of the CAP financing" records values more than 100% and superior to the European average, but still in decline, and highlights significant differences after the entry into force of the new CAP. If in case of Romania in 2000 this indicator was 66.9 %, nine years later it reached at 91.8%, values lower than those recorded in the period 2001 to 2004 when its value exceeded the threshold of 100 and are appreciating that the Romanian agriculture is capable to revitalize them in the general economic context marked by the collapse of industrial activities. One year after EU accession this indicator reached a value of 112.3, and would later continue their downward trend. This accounts shaped for the 2008-2009 period overlaps to the EU-27 trend.

As seen in Table no.1 the Direct aids hold significant share in total budgetary allocations over the period 2008-2010, constituting the main lever of intervention in the agricultural community. In Table 1 are presented the main destinations in financing this.

*Table 1 - Evolution of Direct aids in EU for the period 2008-2010**
*-Million Euros-*

| Heading | Appropriations 2010 | Appropriations 2009 | Outturn 2008 |
|---|---|---|---|
| Decoupled direct aids | | | |
| SPS | 28 480. 0 | 27 239 .0 | 28 233 .8 |
| SAPS | 4 497. 0 | 3 789 .0 | 2 974. 3 |
| Separate sugar payment | 283 .0 | 255. 0 | 206. 2 |
| Separate fruit and vegetables payment | 12 .0 | 12 .0 | N.A |
| Article 05 03 01 — Subtotal | 33 272. 0 | 31 295 .0 | 31 414 .4 |
| Other direct aids | | | |
| Crops area payments | 1 445. 0 | 1 450. 0 | 1 432 .2 |
| Supplementary aid for durum wheat: traditional production zones | 50. 0 | 54. 0 | 46. 1 |
| Payments for specific types of farming and quality production | 449 .0 | 425. 0 | 422. 8 |
| Article 05 03 02 — Subtotal | 5 995. 0 | 5 922. 0 | 5 620 .4 |
| Article 05 03 03 — Subtotal | 6. 0 | 562. 0 | 533 .6 |
| Chapter 05 03 — Total | 39 273. 0 | 37 779. 0 | 37 568 .5 |

Note:* data based on 2010 budget and not containing the whole budgetary classification
*Source: Authors own selection from DG Agriculture, based on Agriculture and Rural Development budget expenditure, 2010 budget*

Direct aids analysis reveals a number of important issues in the area of participation and interest of the CAP, developed under this policy as a result of EU Member interest. Financial allocations in the SPS (single payment scheme) although they have remained constant over the reporting period continue to hold the largest share in direct aids. So this type of financing is the main lever to stimulate agricultural activities in the Member Community. If we consider and SAPS (single area payment scheme) used to finance this budget allocation is 33.272 million, ie. 84.8% of total budget allocations for Chapter 05 03.

*Table 2 - Evolution of the financial allocations for the period 2009-2016 in case of the national ceilings for Romania and some European economies*

| Year state | Bulgaria | Hungary | Poland | Romania | Lithuania |
|---|---|---|---|---|---|
| 2009 | 287 399 | 807 366 | 1 877 107 | 623 399 | 230 560 |
| 2010 | 336 041 | 947 114 | 2 192 294 | 729 863 | 271 029 |
| 2011 | 416 372 | 1 073 824 | 2 477 294 | 907 473 | 307 729 |
| 2012 | 499 327 | 1 205 037 | 2 788 247 | 1 086 608 | 346 958 |
| 2013 | 580 087 | 1 318 975 | 3 044 518 | 1 264 472 | 380 109 |
| 2014 | 660 848 | 1 318 975 | 3 044 518 | 1 442 335 | 380 109 |
| 2015 | 741 606 | 1 318 975 | 3 044 518 | 1 620 201 | 380 109 |
| 2016 and next years | 814 295 | 1 318 975 | 3 044 518 | 1 780 406 | 380 109 |

*Source: Adapted from the Annex no VIII from Regulation (CE) NR. 73/2009 al Council JO L 30/76 din 2009*

As it can be seen from the dates presented in the above table the financing of agricultural policy in Romania, under Article 40 of the Regulation on the establishment of direct support schemes for farmers, is tripled in 2009-2016, reaching a national cap in 2016 and after to the 1,780,406 thousand Euros, higher than that of Hungary, which represent only 1,318,975 thousand EUR, but accounting only 50% of Polish ceiling. These rights for payment can represent for Romanian farmers a motivation for increasing the using degree of the agricultural land and for growth of the financial profitability of a farm. As it is discussed in a recent study, *Salasan and Fritzsch (2009) shows that"strengthening the Romanian agricultural sector calls for concerted policy actions that are finely targeted for different groups. Fostering the restitution of land to former owners, developing a functioning land sales and rental market, and providing access to agricultural product markets could promote the resurgence of a highly productive group of commercial private farmers. Nonfarm job creation in rural areas could provide income opportunities for abundant agricultural labor force"*. Therefore, the role of agricultural sector is more complex than the basic activity in creating food for fork. It has a major impact for rural communities. Agriculture, for transition economies, as it is the Romanian keeps becoming a place for retreat for many social categories as the industrial unemployed or for other categories searching for a place to work. In this context the direct support measures for agricultural activities become more necessary than ever.

## Conclusions

Addressing the Romanian agriculture in the new context of CAP transformation requires the reconsideration of the place and role of this sector in the overall national economy. Reforming Community mechanisms represent an objective necessity generated by the global economic context, where agricultural issues must answer to the criteria of competitiveness, based on existing market and not on an order from state intervention. Even if the agriculture has not been a sector with high competitiveness and severely influenced by the action of external factors (natural and weather conditions) she represent a generally source of added value generation for economies in transition, centered to these economic branch. Even if in the case of Romania the agricultural issues is a very complex and varied problem, in the context of achieving consistency with the Community Space, achieves a concentration on this area of action, in the new context of the frame of CAP. Recognizing the role of agriculture in the national economic system is necessary to adopt some measures designed to increase the productivity of this sector, in terms of increased global competitiveness, where the market role is fundamental.

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# LAND USE POLICIES AND EXTENSION APPROACHES FOR DEVELOPING URBAN HORTICULTURE IN NOVI SAD

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## Abstract

*More than 50% of the Serbian population lives in urban areas that can provide multifunctional services and goods. Urban agriculture is about producing, processing and marketing food in cities and can help achieving urban ecosystems sustainability, improving urban residents' living conditions and diversifying their income-generating activities. This review paper presents the state-of-the-art on urban agriculture in particular benefits; constraints and risks; production sites, systems, techniques and strategies; and some socio-economic and gender aspects. Extension services should develop new advisory and communication approaches to meet urban producers' specific needs. Conducive land use and allocation policies, that can be designed and implemented to promote urban agriculture in Novi Sad, have been discussed.*
***Key words**: Urban agriculture; Land use; Extension; Novi Sad; Serbia*

## Introduction

More than 50% of the world's population lives in cities (Martine, 2007). Many demographers warn that cities will be unable to accommodate large populations. To feed a 10 million inhabitant-city at least 6000 tones of food must be imported daily (Drescher *et al*., 2000). With the world's cities growing rapidly, farming in urban and peri-urban areas is going to play a bigger role (FAO, 2005). FAO has defined urban agriculture (UA) as: "*An industry that produces, processes and markets food and fuel, largely in response to the daily demand of consumers within a town, city, or metropolis, on land and water dispersed throughout the*

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*urban and peri-urban area, applying intensive production methods, using and reusing natural resources and urban wastes to yield a diversity of crops and livestock*." (in Smit *et al*., 1996). Urban and peri-urban agriculture (UPA) already supplies food to about one-quarter of the world's urban population (FAO, 2005) and has become vital to the wellbeing of millions of people. About 15% of food consumed in cities is grown by urban producers and this percentage will double within 20 years. Some 800 million people are estimated to be involved in UA worldwide (UNEP, 2002).

The share of the urban population in Serbia increased for about two and half times, from 22.5% in 1953 to 56.4% in 2002. Over the past two decades, Serbian population increased only in cities (Maksin-Mićić, 2008). Serbian urban areas can become multifunctional thus insuring residential function, provision of services and production of goods. Novi Sad (NS) is the capital of Vojvodina province and Serbia's second largest city. The urban population is 286,157 (129.7 km²) out of a municipal population of 372,999 (702 km²). Some separate towns in the past are now parts of the urban area of NS. Liman and Novo Naselje are neighbourhoods. Neighbourhoods with new housing, as Telep, Klisa, Adice, Veternik, are located away from the city centre. Novi Sad's municipal area includes, apart from NS proper, 12 other settlements. 23.7% of city's population live in suburbs such as Futog and Veternik (Wikipedia, 2010a). UA can help achieving the sustainability of urban ecosystems, improving living conditions and diversifying urban residents' income-generating activities thus representing a very important opportunity in the context of the crisis, that increased significantly urban unemployment. In fact, due to the crisis about 7,000 jobs were lost in Serbia in 2008. According to the National Employment Service, the unemployment rate amounted to 26.54% in August 2009. According to Office of Statistics, in 2008 and 2009 prices increase was around 50%. Serbian households' purchasing power was negatively impacted. High unemployment and food prices are likely to promote UA development in NS.

This work presents the state-of-the-art on UA in particular opportunities and benefits; constraints, challenges and risks; production sites and systems; and small-scale growing methods and techniques. Some socio-economic and gender aspects of UA have been presented as well. Urban producers have specific needs which represent a challenge for extension services that have a new role to play and should develop new advisory approaches and communication methods. UA can not be developed without conducive land use and allocation policies. Therefore, policies that can be designed and implemented to develop UA in NS have been presented and discussed.

## Material and methods

The lack of adequate, reliable and updated secondary data on UA in Serbia in general and NS in particular has been the main constraint faced during the preparation of this paper. In fact, it has been so difficult to get data about small agricultural producers and areas that are/can can be dedicated to agricultural activities in NS from extension service and official offices. It was hard as well to get information from the public services data systems and websites. Even urban people; especially some women and elders who are producing vegetables and flowers on backyard gardens, balconies, etc; do not consider themselves as urban agricultural producers and consider these activities only as a pastime, hoppy, etc.

Usually, their knowledge is based on tradition and they state that they have not been contacted by extension agents and other civil servants dealing with agriculture. For all these reasons, the paper is based mainly on the international specialised literature while the initial idea was to carry out some semi-structured interviews with urban agricultural producers, extension agents and decision makers. Moreover, international literature dealing with UA focus mainly on developing countries. Initiatives developed in some cities of developed and in transition countries can be hardly useful in the case of NS.

## Results and discussion

The scope of UPA can vary due to economic conditions, cultural aspects, infrastructure, availability of inputs (soil, water), climate, etc. (FAO, 2001). Often, multiple farming and gardening systems exist in and near a single city but the main components of UPA are crop production, animal husbandry, forestry, and aquaculture (Boland, 2005; FAO, 2001). Urban horticultural activities regard micro-gardens for production of mushroom, ornamentals, condiments and aromatics; highly intensive cultivation systems; and small-scale nurseries (FAO, 2001). UPA also includes non-food products and minimal processing (Boland, 2005). UA can be found in home, community and school gardens, on vacant plots, on balconies, on roof tops, on open spaces, on road strips, along railways, in fishponds, in rivers and their banks, in backyards, on walls, etc. (FAO, 2001). The most common small-scale growing techniques used in UA are: container culture; in pots or other containers or tires; in sacks; in shallow beds and in a compost pit, or variants such as compost trench or bed and dung pit (Boland, 2005). Crops may be grown for own food supply or for the market. Urban producers can also deal with trade, marketing or selling (Boland, 2005). The transformation of cities from only food consumers to generators of agricultural products contributes to poverty alleviation, food safety, sustainability, local development, health improvement, generation of jobs and income, self-esteem, and environmental improvement (Wikipedia, 2010b). Urban horticultural production can be a means to increase employment and satisfy food demand in cities (FAO, 2001). The main benefits of UA on urban households and communities includes also recreation; economic diversity and stability; reduction of solid waste disposal costs; dietary diversity; community cohesion and well-being; and gender equity (Koc *et al*., 1999).

Women play an important role in household food supply and their income has a greater positive impact on children's health and nutritional status (FAO, 2001). UA can be an opportunity for urban women to provide their households with food that is not dependent on prices, cash incomes or fluctuating markets and can be an important income source for them. That's why women perceive very often urban agricultural activities as a way to achieve self-reliance and empowerment (Boland, 2005).

UA development requires water-conserving farming systems; adequate agricultural extension services; strong linkages between production, processing and marketing; greater decentralization of agricultural policy, etc. (FAO, 2001). Basic constraints of UA are excessive use of agricultural inputs, land tenure and low income of UA producers. UPA, especially animal husbandry, can cause many health and environmental risks (FAO, 2001).

The use of waste water without treatment can spread diseases and cultivation on biologically or chemically polluted land can represent a health hazard to workers, producers, handlers and consumers (Boland, 2005). UA can produce noise, dust, odours, and a perception of untidiness (HBPG *et al.*, 2002; Koc *et al*., 1999). These negative outputs can lead to conflicts and undermine urban community cohesion and harmony thus should be kept under check. Most of these problems can be prevented and/or addressed by adequate support of producers by extension services to adopt Good Agricultural Practices (GAPs) (FAO, 2001). Availability of and access to land and water are fundamental for UA (FAO, 2001). However, space is expensive and, often, fragmented in cities and agriculture is less competitive than other sectors (HBPG *et al.*, 2002). It is necessary to increase access to land by eliminating all legal and economic restrictions. This can be a challenge for urban planners and requires the definition and implementation of sustainable urban development plans. Low income urban and peri-urban households can have difficult access to credit and should be assisted by adequate savings facilities and complementary credits (FAO, 2001).

UPA is hardly ever recognized as being an important subject by extension agents. Extension services for UA; that are extremely limited to not existent; can help urban producers; through training, education, communication and community organization; to select appropriate crops, to achieve integrated pest management, to use efficient production and water management technologies, to add value to their production through processing, to schedule production, to improve harvesting techniques while ensuring food safety, etc. They can also coordinate inputs purchase, transportation, storage, credit and marketing. For that extension staff need a sound necessary background theory and multifaceted practical skills (FAO, 2001). In Serbia, public agricultural extension is mainly addressed to commercial family farms and lesser attention is paid to small producers such as urban ones. Extension work includes mostly visits to farms, but other types of communication and extension methods are needed to deal with urban producers. Usually, small producers, must go by themselves to ask for an advice. In general, extension agents can not provide urban producers with all the specific information they need. Moreover, extension agents prefer, generally, to work with farmers with whom the cooperation is easier, who are more interested in extension support and who have more financial means to put into practice their production and management advice. Furthermore, extension services in Serbia in general and Vojvodina in particular face many problems in dealing with producers as well as finance, management, technical support problems, overload with non-extension activities, low number of extension agents, etc. (Petrović *et al*., 2009). Lack of adequate administrative data system about producers is another salient problem. It goes without saying that these problems should be addressed in order to allow advisors to provide effective and timely advice to urban producers.

The future of UPA in NS, as in any other city, depends on policies for managing urban areas and coordination and information sharing among authorities dealing with agriculture, forestry, parks and gardens, public works, transportation, urban planning, etc. Municipalities, such as NS, should formulate and implement urban development policies that take into account the need to dedicate areas for UA. It is necessary to design urban development plans that impose specific norms for land use (FAO, 2001). The main requirements for planning and implementation

of UA are awareness raising, creation of a municipal institutional framework, and identification of stakeholders, main constraints to agriculture and greening; current and potential sites for UPA, and potential cultivation practices (FAO, 2001). In order to integrate UA in NS municipal area it is necessary to provide a clear policy and new regulations encouraging UA; to provide incentives to public and private developers to encourage them to include UA in the new residential and commercial projects; to use public buildings and land for small demonstration projects; to develop trainings for extension staff, urban planners and producers; to establish partnership with NGOs to develop a culture celebrating local food, etc. Moreover, UA should be regulated by municipality and included in urban development plans dealing with political, legal and regulatory issues (Cabannes and Dubbeling, 2003). Defining a well tuned land use policy means to examine the existing situation, to establish a municipal committee for UA, and to initiate a process of public consultation involving all relevant public, civil society and private stakeholders in round-tables or mixed committees, that can also monitor the implementation of the policy and resolve conflicts. The policy should encompass regulatory and legal frameworks, and planning and management tools to pave the way to the development of UA in NS. UA should be included in municipal and sub-municipal urban development and land use plans. Land use plans should clearly delineate spaces that could potentially be used for UA and allow an easy and secure access to land suitable for UA by issuing transfer of land titles for temporary use; allowing private, group, and cooperative land ownership; defining land taxation and tax exemptions; etc. Apart from land ownership there is a wide range of arrangements that can be applied for insuring an easy access to land by urban producers such as economic and usufruct rent or lease, licensed and unsanctioned farming, and informal agreements (Boland, 2005). Planning and management tools will allow the legal and regulatory frameworks to be implemented effectively and efficiently. It is important to have registration of urban agricultural land. Geographic Information System (GIS) use can allow improving land use monitoring and evaluation. It is also important to have municipal UA land price registries as they are useful for monitoring fluctuation of urban land prices and the rate of return on agricultural plots (Cabannes and Dubbeling, 2003).

## Conclusions

Urban agricultural activities development can bring about many benefits to the residents of NS. However, public institutions should tackle effectively the new challenges and problems that will arise in order to minimize health and environmental risks and hazards. Extension agents should be able to advise urban producers on the use of appropriate small-scale and intensive production methods and techniques and GAPs and also on how they can reduce the negative impacts of their activities on their urban neighbours and the urban ecosystem mosaic as a whole. Women are often highly motivated to deal with UA so that they should be considered as key stakeholders and involved in consultations and roundtables, organized by public institutions, and capacity building activities and trainings, organized by extension services and civil society organizations, among others. UA can not be developed without conducive and enabling land use policies and regulations and frameworks facilitating access to and securing use of urban spaces for agricultural purposes and promoting agricultural production in urban and peri-urban areas. These policies should be developed in a participatory and inclusive way involving all

actors in the municipal area of NS. Planning, management, monitoring and evaluation tools are also necessary to make sure that plans for UA development are implemented properly.

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UDK: 631/635:005.591.6

# ROMANIAN RURALITY WITHIN A MODERN CONCEPTUAL MODEL

*Raluca Ignat*[1]

## Abstract

*According to the Lisbon Declaration and to the necessity of growing Romanian economy competitiveness in knowledge based society, we consider requisite frontier research in agrifood field in order to lead to superior outputs of field producers and traders and to adopt higher competitive behaviour. Research demonstrates the opportunity of elaboration of a modern conceptual model for rural economy development: agrifood industrial city, able to provide economic growth of Romanian agrifood sector in knowledge based society. Also, the research reveals possibilities of higher life conditions. In order to demonstrate this, analysis and synthesis of studies, reports, articles and other materials including empirical studies and statistics on this topic were conducted.*
***Key words**: agrifood urban centre, rural economy, agrigood industry, conceptual model, knowledgy based society*

## Literature review

Rural economy polarizes numerous researchers, as both American schools in this research domain around Professors Carver and Taylor, and European schools, like this from Bucharest Academy of Economic Studies within Faculty of Agrifood and Environment Economy. New perspectives of rurality are tested here. The SMEs' key role for rural development is demonstrated by their contribution to regional income and labour stabilization. In Romania there are 4SMEs/1000 inhabitants and over 50% of them have trade as main objective. They are not involved in production, which is a weakness of rural activity.

Studies' results demonstrate the raising importance of new industrial models, where education and inovation seem to be a priority for SMEs' survival (Nijkamp, P. 2006). The relations between agrifood companies and environment also appear vital (Voicu, R. 2003),

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as well as compatibilization of all agrifood organizations in Romania. Modern agrifood companies founded based on European funds and private investments confrunt both pour inputs from Romanian agriculture and different standards for product's trasability. All these impose moderm management models. Between March and April 2010, Gross Index of food industry decline with 12,2%, and incomes with 12,6%, both been situated on a diminishing trend.

Thus, alternative solutions were founded by authors in the field. Moreover, an European strategy for this domain was somehow design. Local authorities of Modena, Italy, finance inhabitants for finding solutions in order to finance urban centres for food procesing on EU territory. Cities as Svishtov, Bulgaria, and Viadrina, Poland, that were founded centuries ago, were recently develop as university centres; in Svishtov, more than 25% of population are students, and the main part of infrastructure has this specific destination. Cluster is the main instrument in IT industry and it is used for process's profund efficiency by diminishing the effort and used time.

Measurement 123 of Romania's National Plan for Rural Development 2007-2013 represents a financial resource for food procesing, and Gouvernment Decision 1068/23.09.2009 sets the national legal framework for interprofesional agrifood products organizations' starting and functioning.

Precursor ideas are given by recent efforts in order to concentrate and put togheter agriculture land so that farmers to be more performant. Rural Development and Extension Consortium was constituted after a research financed by World Bank between 2004-2005 in Calarasi county. It prime goal was to create cooperation between farmers within. The research continued in Giurgiu county by testing diverse forms of farmes associations, especially in cows husbandry and trade.

## Methodology

Research starts from the premises that actual conditions of rural economy impose new approach for its development. Documentation was conducted on the current exemplas of urban centres organised on different activities in diverse field.

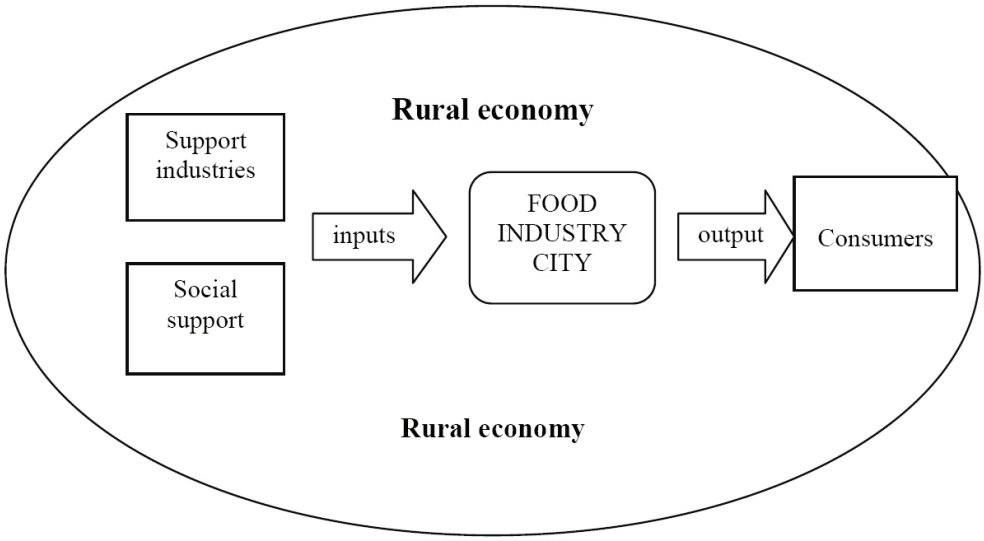
Furthermore, analysis and synthesis of present situation of rurality presented on studies, reports, articles and other materials including empirical studies and statistics on this topic were conducted, together with comparative studies and case studies.

## Results and discussions

According to the Lisbon Declaration and to the necessity of growing Romanian economy competitiveness in knowledge based society, we consider requisite frontier research in agrifood field to lead to superior outputs of field producers and traders and to adopt higher competitive behaviour on their behalf. For this reason, the research may continue with a simulation of a conceptual model for agrifood industry: agrifood industrial city which requires all stakeholders' cooperation on a product branch in direct and immediate connection with the intention to raise economic performance.

The vision of this type of city is to concentrate within a modern urban centre founded with this aim all actors on an agriculture product branch in order for them to obtain higher added economic performance. This poses a vertical integration of producers and traders of a product's branch and their physical and economic proximity. In this way, we start from the premises of growing economic performance of food processing, as this city may benefit specific transport and utilities infrastructure and modern processing lines, as well as available labour that could be qualified.

*Figure 1 – Model of Food Industrial City in rural economy*




Obviously, this project involves high costs. We propose to elaborate a methodology of creation and functioning of such city, throughout an economic perspective and to quantify the impact on rural economy as well as its pertinence while creating, calculating and analysing specific indicators.

The main objective is to create this city as a response to both local rural economy and Romanian food industry needs. In order to establish this, certain objectives should be developed:

- to elaborate a methodology for food industrial city's creation and function;
- to create system of indicators able to quantify the impact of this city's function over rural economy and other economic sectors and social activity;
- to quantify and analyse the value ecart of created indicators;
- to be in permanent contact with local authorities, policy makers and stakeholders.

The methodology for food industrial city's creation and function should involve following activities or steps:

*Table 1– Timetable for setting Food Industrial City in rural economy*

| | |
|---|---|
| PHASE 1 – Methodology for food industrial city's creation and function | |
| | Activity 1.1 – Analyse of economic performance within Romania's rural economy and food industry |
| | Activity 1.2 – Analyse of European and national legal framework for food industrial city's creation and function |
| | Activity 1.3 – Identify the main food product for food industrial city |
| | Activity 1.4 – Identify the potential space/region for food industrial city |
| PHASE 2 – Indicators system for impact quantification of food industrial city | |
| | Activity 2.1 – Documentation |
| | Activity 2.2 – Elaboration of indicators system |
| PHASE 3 – Comparative study on pre and post food industrial city's implementation | |
| | Activity 3.1 – Simulation of food industrial city's implementation |
| | Activity 3.2 Calculation and interpretation pre and post food industrial city's implementation |

Throught its objectives, the research proves originality and innovation. The food industrial city's implementation contributes the field knowledge development.

## Conclusions

The research reveals the conceptual model of food industry city in a modern perspective, an original specific indicators system in order to be able to quantify the ecart of its results obtained in pre and post food industrial city's implementation. These may aim: result indicators (supply time diminishing), accomplishment indicators (obtained food production), pertinence indicators (number of new created jobs, number of families that benefit of urban life conditions), efficiency indicators (value of obtained food production compared with proposed production), performance indicators (ecart of GDP/inhabitant, GAV), quality life indicators (number of new created kindergarten).

To accomplish the research objectives imposes interdisciplinary and a frontier approach. Knowledge in different areas will coop and conclude.

The model may constitute a good practice for other filed or countries, and provides a high level of transfer to public and private sector. Its implementation gives a new identity to Romanian rurality.

## Acknowledgements

This work was co financed from the European Social Fund through Sector Operational Program Human Resources Development 2007-2013, project number POSDRU/1.5/S/59184 „Performance and excellence in postdoctoral research in Romanian economics science domain".

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UDK: 339.137.2:001.895

# RELATIONSHIP BETWEEN THE INNOVATION AND COMPETITIVENESS [1*]

*Lădaru Georgiana Raluca[2], Romanescu Doinița[3], Rusescu Marius[4]*

## Abstract

*This paper is written in order to shed light on the complex relationship between the innovation and competitiveness. Innovation is the end of a supply process, know-how and processing. It is also the beginning of an exploitation process, which may lead to improve the firm performance, namely its competitiveness. This recursive process of knowledge supply, processing and exploitation includes the value chain innovation. In the operation phase, innovation both in the products and in the process, contribute positively on the company performance.*
***Key words:*** *competitiveness, innovation, globalization, performance*

## Introduction

In the current economic landscape at the beginning of XXI century, business is characterized by an increased impetus as a result of globalization and rapid changes occurring in business. Under the impact of technical progress, the process of liberalization and opening numerous international markets increased, companies are determined to restructure activities and increasingly, becoming more of them engage in the global competition. In today's economy, characterized by dynamism, unprecedented success of the companies in foreign markets depends on its ability to provide superior value to those offered by competitors

1 * This article is a result of the project „Doctoral Program and PhD Students in the education research and innovation triangle". This project is co funded by European Social Fund through The Sectorial Operational Programme for Human Resources Development 2007-2013, coordinated by The Bucharest Academy of Economic Studies.

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its competitiveness. Under the impact of globalization, a phenomenon that has radically transformed our world, firms must also face new challenges; competitiveness has become a prime target and a prerequisite for their success in the contemporary economy.

## Body paper

Achieve economic performance in the XXI century the specific competitive environment characterized by fierce competition depends on the ability of firms to expand the activities in foreign markets, identify and exploit opportunities offered by them. Globalization has created new opportunities for companies while new challenges. Opportunities include on the one hand, access to new markets previously inaccessible because of the cost, existing rules or indirect barriers, and secondly, the opportunity to participate in global production networks that prevail in many industries (automotive, electronics and textiles). The challenges come from foreign competitors but also from domestic competitors to reduce their direct costs or economies of scale achieved through expansion into new markets. Globalization is causing companies to become more efficient, modernize and retrofit production processes while continuing geographic expansion of their operations.

Since 2000, accelerating socio-economic transformation of the competitive environment of globalization, trade liberalization, internationalization of business, technological revolutions, etc. determine a more fierce competition for any company became a certainty that a requirement more important than performance in a modern economy is competitive and, particularly, that of exports. In a world that increasingly speaks more about globalization, the emergence of global production chains, service development, diversification and customization, the major changes occurring in buyers' behavior, it is clear that the export, be it product services, labor or - why not - culture can not be random, but after a well-established. Therefore, competitiveness does not occur by itself, but must be planned.

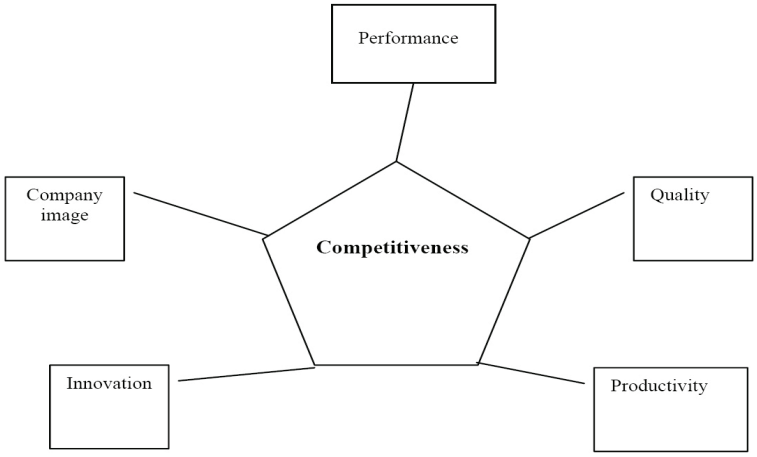
In contemporary society, the key to a firm, namely its competitiveness on foreign markets is its ability to identify and provide sources of value creation and exploit them properly. Companies are vectors of sustainable development in the national economy, making international competition in recent years, the arena in which both companies, as well as countries play their course book socio-economic progress. Engine efficiency and economic progress, competitiveness is the key to sustainable development both at a national economy and the firm, for all participants in the world economic circuit. At company level, competitiveness is the ability to provide superior products and services in terms of quality or better price than that of other significant competitors. Dimensions of firm-level competitiveness refers to profitability, cost and quality of its exports to regional market or global market, international market performances representing a direct expression of a firm's competitiveness.

John Kay[5] believes that the competitiveness of a company as determined by four factors, namely:
• Ability to innovate;
• Internal and external relations;
• Reputation;
• Strategic assets.

In this context, competitiveness coverage expanded by taking into account tangible and intangible resources, which can give a firm competitive advantage[6]. The competitive approach must take account of factors related to flexibility, adaptability, quality and marketing[7], understanding competitiveness not only in terms of productivity, but as the ability of companies to design and / or produce higher existing market in terms of price and non price-quality[8].

Ambastha and Monaya believes that competitiveness dimensions can be grouped as follows:
- Performance, including the financial one, such as earnings, profitability etc..;
- Quality, not just products and services, including the ability to meet customer expectations;
- Productivity, in terms of production volume as much as using a small volume of resources;
- Innovation, including products and services and processes;
- Reputation, including corporate branding in terms of building trust and reputation in dealing with stakeholders.

*Figure no. 1 - The five dimensions of competitiveness*




**Source:** Vilanova M., Exploring the Nature of the Relationship Between CSR and Competitiveness, Journal of Business Ethics, 2008

5 Kay, J.: 1993, Foundations of Corporate Success (Oxford, Oxford University Press).

6 Hamel, G. and C. K. Prahalad: 1989, Strategic Intent, Harvard Business Review 3.

7 Barney, J.: 1991, Firm Resources and Sustained Competitive Advantage, Journal of Management 17(1).

8 D'Cruz, J. and A. Rugman: 1992, New Concepts for Canadian Competitiveness (Kodak, Canada).

Referring to the innovation, it is difficult to characterize a dynamic process as it is. Innovation refers to activities involving innovation, change and development, also refers to the risk, anxiety and resistance, and also the excitement and reward. It should be clarified at the outset the distinction between innovation and invention. The invention involves designing a new product or process or service, while innovation involves improving a product, service or existing process for it to be more profitable[9].

Innovation is not always a revolutionary process, but can be done in small steps. To materialize innovation is undergoing several phases[10]:

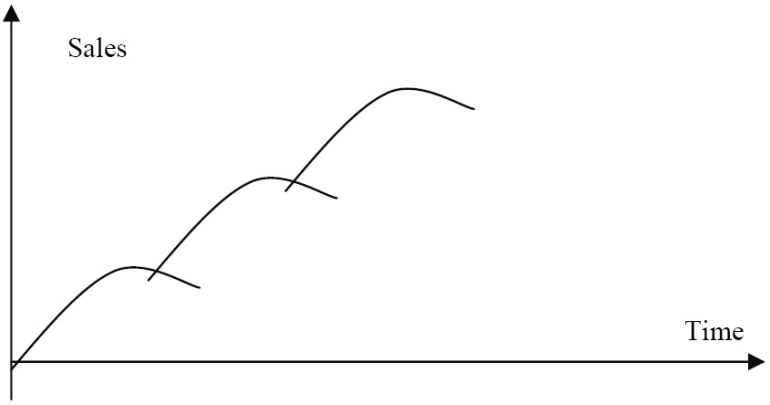
1. Call to source ideas: imagination, observations, analysis.
2. Creativity to generate new ideas.
3. Refining the idea to determine if the idea is consistent with company policy and issues.
4. Technical feasibility and economic justification for the utility of the idea.
5. Practical implementation of new ideas.
6. The result: new product, new process, lower costs, etc.

To materialize innovation is achieved various activities[11] such as:

- Horizontal transfer activity: innovations -> new applications;
- Vertical transfer activity: Knowledge -> Research -> new product / new technology;
- A new company organization -> a new image.

Products and their life cycle, innovation is a chance for longer survival, increasing sales volume by default, a situation shown in graph no. 1:

*Graph no. 1 The influence of innovation on product life cycle*




*Source: Professor Tann, J.; BA; Ph., D.; Management of Innovation, The Oxford Open MBA, Editura Oxford Brookes University, 1995*

9 Plumb, I.; Vişan, S.; Florescu, M. 2007, Managementul cercetării şi inovării, Editura ASE, Bucureşti

10 Călin, G.C.; Botez, L.F. 2000, Creativitate şi inovare, Editura ASE, Bucureşti

11 Băloiu, L.M., Frăsineanu, C., Frasineanu, I. 2008, Managementul inovațional, Editura ASE, Bucureşti

As to the sector concerned, innovation can be technological or economic. In short, technological innovation includes those activities aimed at creating a new product, introducing a new manufacturing methods, using a new material or replace the existing one another better, etc.. And economic innovation focused on issues such as entering a new market or creating a new market, a new company or organization a new image of the company.

Different types of innovations may have different economic effects:

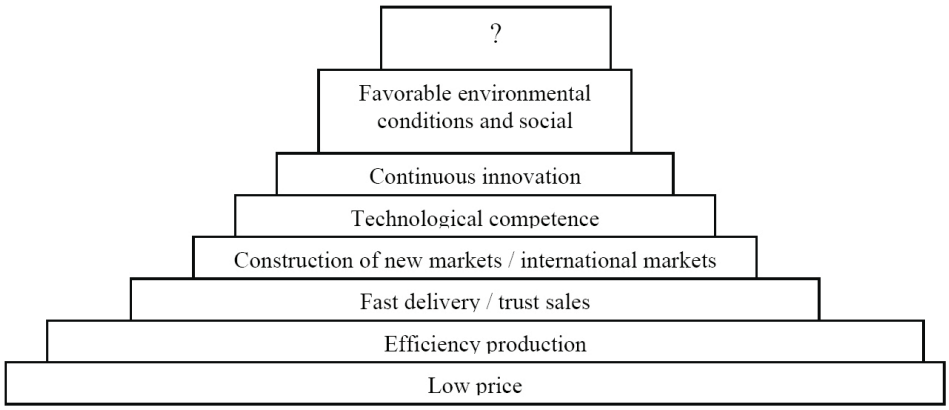
- Can maintain and even reinforce old business relationships;
- Create new business relationships;
- Retain existing technologies;
- Creates new logistics technology.

Competition requires companies to constantly invent, not to be removed from the market. There are times when you can change the competitive position of companies on the market through field experience and technical progress.

Technical progress contributes to business competitiveness, thus increasing its capacity to withstand competition. Cut costs technologies to, increase product quality, operational safety, consumer protection, environment, human physical effort so low. And be sustainable competitive advantage. Moreover, technology can restructure a domain.

An interesting approach on competitiveness conducted by the Ministry of Industry in Denmark[12]. He made a pyramid of competitiveness that seven factors are relevant, but allow consideration of others and leaving the development open to new factors suggested by the quadrangle of blank peak.

*Figure no. 2 – The competitiveness pyramid*




Porter, Michael, the largest specialist in issues of competitive advantage - essentially element in achieving competitive advantage in macro, meso and micro - considers competition as the determining factor in success and failure of companies[13].

12 Nicolescu O., Nicolescu L. 2005, Economia, firma şi managementul bazat pe cunoştinţe, Editura Economică, Bucureşti

13 Porter M., The Competitive Advantage of Nations, New York: The Free Press, 2006.

## Conclusions

In a constantly evolving economy, constantly affected by social, political and economic influences, innovation may be one of the competitive advantage of companies in relation to direct competitors. Even if on short-term, innovation innovation does not always bring the hoped for benefits, in the medium term and long term, one that differentiates from the competition is that who innovate, adapt to the market develops and acquires not last that long awaited advantage.

Relationship competitiveness - innovation must be seen in the duality of her character. On the one hand we believe that the relation between this two characteristics of any companies is a direct one, in this case we came up with an example from auto market, if a manufacturer develops a new braking system which proves reliable and help increase safety passengers, the innovation presented by the current manufacturer aims to increase confidence among consumers towards it, gaining competitive advantage in a short time expected.

On the other hand innovation can influence competitiveness in the negative way, limiting its evolution, when companies develop new products and services without prior investigation into consumer needs and preferences.

Viewed as a whole of market mechanisms, competitiveness is a prerequisite for success in the contemporary economy.

In conclusion, it can come off the idea that competitiveness refers to products and services capability to withstand the test market both domestically and internationally, in terms of profitable, resulting in constant increases in productivity and improvements in living standards.

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Economics of agriculture
SI – 2
UDK: 634.8.05+663.2:631.1.016

# THE VITICULTURE AND WINE PRODUCTION IN THE FUNCTION OF MULTIFUNCTIONAL AND RURAL DEVELOPMENT OF AGRICULTURE

*Marko Matić[1], Marko Ivanković[2], Senka Bunoza[3]*

## Abstract

*By using scientific methods applied in this scientific work such as: analytical method, quantitative analysis- costing calculation (the cost principal) and mathematical and statistical method (the dynamic analysis of trends),the authors have reseacherd the economic efficiency and profitability of grape and wine varieties Žilavka and Blatina on the family estate in West Herzegovina. The research was conducted in the period 2006 – 2008. The results reached by the authors are following:*

*The economy of grape Žilavka production quoted by the economy coefficient was 1,12 in 2006 and 1,31 in 2008, and for Blatina 1,18 in 2006 and 1,34 in 2008.*

*The production rentability of grape Žilavka quoted by the rentability coefficient was in the range of 12,03 % in 2006 up to 31,15 % in 2008, and for grape Blatina from 15,95 % in 2006 up to 25,66 % in 2008.*

*The economy of wine Žilavka production quoted by the economy coefficient was in the range of 1,41 in 2006 up to 1,47 in 2008, and for wine Blatina 1,42 in 2006 up to 1,47 in 2008.*

*The rentability of wine Žilavka production quoted by the rentability coefficient was in the range of 29,06 % in 2006 up to 31,96 % in 2008, and for wine Blatina 29,81 % in 2006 up to 32,19 % in 2008.*

***Key words**: grape, žilavka, blatina, wine, economy, rentability, scientific methods.*

## Introduction

In the last decade of development both viticulture and wine-production have made new successes in technology and economy of production.

There's no doubt that intensification of production process granted privileges for such

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fast success. The result of that are modern plantations and contemporary modern wine cellars on family estates in all over the Herzegovina.

The area of researched estate is 7 ha and all the 7 ha are planted with Žilavka and Blatina sorts. This estate owns modern and air-conditioned cellar with capacity of 35 000 liters. It is also equipped with modern machines for the first manufacture, ripen and bottling the wine.

This cellar is equipped with inox cisterns and vats for wine fermentation. Congruently to applied technology all the vessels have heating and colding systems for wine necessities. Elementary equipment on this estate are: John Deer 75 KS tractor, Fendt 209 tractor, cellar capacity of 35 000 litres, grape crusher of 2 000 kg/h capacity, wine-press of 2 000 kg/h capacity, filler and stoppler of 500 bottles/hour capacity, inox cisterns, wooden and barique barrels of 250 hl, pumps for rack wine
2 000 l/h, compressor and connectives.

Wine brands are of high-quality and are well-known Žilavka and Blatina wich are filled in bottles of 0,75 l and 0,25 l and loza brandy filled in bottles of 0,75 l.

## More important organizational caracteristics of the researched estate

*Natural conditions for wine-production (position, climate and ground)*

The vineyard is in a village Studenci near regional road Ljubuški – Čapljina. It is located on softly inclined ground with a lot of sunny days which is privilidge for the planted sorts.

The ground with the vineyard is a deep brown with satisfied water permeability and biologicaly active. Reaction of the ground is slightly sour.

*The system of growing and wine sorts*

In the researched family estate the growing sort of wine is two-sides cordon with planting distance 100x180 cm. It means that there are 5 000 grape-vine on 1 hectare. The vineyard is 9 years old. Žilavka and Blatina vines are planted together with accompanying sorts on area of 7 hectares.

There are: white sorts: Žilavka 80%, Bena 10% and Krkošija 10%; and red sorts: Blatina 80%, Trnjak 10% and Alikant 10%.

## Tasks, aims and methods of the research

*Task and aim of the research*

The task of the research is to establish, investigate and analyse all the economical factors of grapes and wine production based on all relevant indicators (technical, market, organizational and economical). The task is also to calculate efficiency of the business, first of all economy and profitability of grape and wine production.

The aim is to research all important factors which directly and indirectly influence the economy of grape and wine production on the researced family estate. These factors are very important for the economy and profitability of the business.

*The methods of the research*

To establish the results in this research we use scientific methods which are used in agricultural and economical researces such as:

1. Analytic method
2. Quantitative analisis – accounting calculation (expenses)
3. Mathematical and statistical method – dynamic analisis of a trend.

## Grapes and wine production and its expenses and incomes

*Table 1. - Accounting calculation for 1 ha of a vineyard for Žilavka grape in 2006*

| Ordinal number | A. Machine work | Un.of measure (hour) | Quantity in hours | Price of an hour expressed in KM | Value in KM |
|---|---|---|---|---|---|
| 1. | Manure | hour | 10,00 | 12,00 | 120,00 |
| 2. | Drawing remains of grapevine | hour | 3,30 | 12,00 | 39,60 |
| 3. | Throwing mineral dung | hour | 3,30 | 12,00 | 39,60 |
| 4. | Ploughing and cultivation | hour | 18,00 | 12,00 | 216,00 |
| 5. | Spraying and sprinkling | hour | 52,00 | 12,00 | 624,00 |
| 6. | Grape transport | hour | 6,00 | 12,00 | 72,00 |
| 7. | Other machine works | hour | 10,00 | 12,00 | 120,00 |
| **Total** | | **hour** | **102,60** | **12,00** | **1.231,20** |
| | **B. Handicraft** | | | | |
| **1.** | **Cutting the vine and fixing the armature** | **hour** | **116,00** | **5,00** | **580,00** |
| **2.** | **Loading, unloading of reproduction material and protection means** | **hour** | **6,00** | **5,00** | **30,00** |
| **3.** | **Weeding vine** | **hour** | **42,00** | **5,00** | **210,00** |
| **4.** | **Vintage** | **hour** | **116,00** | **5,00** | **580,00** |
| **Total** | | **hour** | **280,00** | **5,00** | **1.400,00** |
| | **C. Reproduction material** | | | | |
| **1.** | **Mineral dung N:P:K 7:20:30 i KAN 27 %** | **kg** | **700,00** | **0,43** | **300,00** |
| **2.** | **Protection means Folpan 0,2%, Chromosul 0,3 %, Mikal flash** | **kg** | **42,50** | **9,50** | **403,85** |
| **3.** | **Protection means Ronilan, Ronilan Gold, Antrakol, Folpen** | **ml** | **18,00** | **13,80** | **248,60** |
| **4.** | **Bordeau soup** | **kg** | **40,00** | **4,55** | **182,00** |
| **5.** | **Manure** | **t** | **3,00** | **300,00** | **900,00** |
| **Total** | | | | | **2.034,50** |
| **Total: A+B+C** | | | | | **4.665,70** |

*Source: own research*

Direct expenses in producing Žilavka grape on one hectre were as follows: 4.665,70 KM in 2006, 5.598,10 KM in 2007, and 7.045,50 KM in 2008.

Depreciation, gross salaries and other indirect expenses were as follows: 6.313,25 KM in 2006, 7.035,20 KM in 2007 and 7.799,64 KM in 2008.

Total expenses in producing Žilavka grape on one hectre of a vineyard were as follows: 10.978,95 KM in 2006, 12.633.30 KM in 2007, and 14.845,14 KM in 2008.

Total expenses in producing Blatina grape on one hectre of the vineyard, calculated by the same methods, were as follows: 10.992,81 KM in 2006, 12.656,90 KM in 2007, 14.945,58 KM in 2008.

*Table 2. - Prices of Žilavka and Blatina grape in a period 2006. - 2008.*

| Year **Žilavka** | **Production expenses in KM/ha** | **The number of grape-vines on one hectre** | **Agricultural produce of grape in kg / ha** | **Grape price in KM/kg** |
|---|---|---|---|---|
| 2006. | **10.978,95** | 5.000,00 | **10.250,00** | **1,071** |
| 2007. | **12.633,30** | 5.000,00 | **11.580,00** | **1,090** |
| 2008. | **14.845,14** | 5.000,00 | **12.980,00** | **1,144** |
| Year **Blatina** | **Production expenses in KM/ha** | **The number of grape-vines on one hectre** | **Agricultural produce of grape in kg / ha** | **Grape price in KM/ kg** |
| 2006. | **10.992,81** | 5.000,00 | **10.900,00** | **1,008** |
| 2007. | **12.656,90** | 5.000,00 | **12.100,00** | **1,046** |
| 2008. | **14.945,58** | 5.000,00 | **13.400,00** | **1,115** |

*Source: own researc*

The prices of Žilavka and Blatina grape have risen during the period of research. Reasons for that were rises of the prices of labour, reproduction material and machine work in grape production.

*Table 3. Production value – total income of Žilavka and Blatina grape in period 2006 - 2008.*

| **Žilavka** | **The number of grape-vines on one ha** | **Agricultural produce of grape in kg/ha** | **Grape sellling price in KM/kg** | **Value of the produced grape in KM/ha** |
|---|---|---|---|---|
| 2006. | **5.000,00** | **10.250,00** | **1,20** | **12.300,00** |
| 2007. | **5.000,00** | **11.580,00** | **1,30** | **15.054,00** |
| 2008. | **5.000,00** | **12.980,00** | **1,50** | **19.470,00** |
| **Blatina** | **The number of grape-vines on one ha** | **Agricultural produce of grape in kg/ha** | **Grape sellling price in KM/kg** | **Value of the produced grape in KM/ha** |
| 2006. | **5.000,00** | **10.900,00** | **1,20** | **13.080,00** |
| 2007. | **5.000,00** | **12.100,00** | **1,30** | **15.730,00** |
| 2008. | **5.000,00** | **13.400,00** | **1,50** | **20.100,00** |

*Source: own research*

*Wine production, its expenses and incomes*

During wine production, proceses of grape production and manufacture represent intermediate stage in wine production.

Grape production and manufacture expenses will determin the price of wine production. Directly and indirectly they will influence the financial result of the business.

*Table 4. Total expenses in Žilavka and Blatina wine production (0,75 l) in period 2006. – 2008.*

| **Žilavka** | | | |
|---|---|---|---|
| **Kind of expense in KM** | **2006.** | **2007.** | **2008.** |
| Raw material expenses (grape) | 1,337 | 1,362 | 1,428 |
| Manufacture bottle expenses (0.75l) | 0,649 | 0,763 | 0,936 |
| Bottle filling expenses (0.75l) | 1,199 | 1,499 | 1,874 |
| **Total** | **3,185** | **3,624** | **4,238** |
| **Blatina** | | | |
| **Kind of expense in KM** | **2006.** | **2007.** | **2008.** |
| Raw material expenses (grape) | 1,260 | 1,307 | 1,393 |
| Manufacture bottle expenses (0.75l) | 0,664 | 0,783 | 0,922 |
| Bottle filling expenses (0.75l) | 1,237 | 1,599 | 1,924 |
| **Total** | **3,161** | **3,689** | **4,239** |

*Source: own research*

*Table 5. Economy and profitability in grape and wine Žilavka and Blatina production in period 2006. – 2008.*

| **Years** | **2006 in %** | **2007 in %** | **2008 in %** | **On an average in %** |
|---|---|---|---|---|
| **a) Žilavka grape** | | | | |
| **Economy** | **1,12** | **1,19** | **1,31** | **1,21** |
| **Profitability** | **12,03** | **19,16** | **31,15** | **20,78** |
| **b) Žilavka wine** | | | | |
| **Economy** | **1,41** | **1,43** | **1,47** | **1,43** |
| **Profitability** | **29,06** | **30,31** | **31,96** | **30,44** |
| **Years** | **2006 in %** | **2007 in %** | **2008 in %** | **On an average in %** |
| **a) Blatina grape** | | | | |
| **Economy** | **1,18** | **1,24** | **1,34** | **1,25** |
| **Profitability** | **15,95** | **19,53** | **25,66** | **20,38** |
| **b) Blatina wine** | | | | |
| **Economy** | **1,42** | **1,44** | **1,47** | **1,44** |
| **Profitability** | **29,81** | **30,78** | **32,19** | **30,92** |

*Source: own research*

## Conclusions

On basis of the previous research of economy in grape and wine production on an estate, the authors have concluded the following:

1. The economy of Žilavka grape is in range from 1,12 to 1,31 , and the highest was in 2008 (1,31). The three-year average coefficient of economy for Žilavka grape was 1,21. the economy of Blatina grape production is in range from 1,18 to 1,34. The three-year average coefficient of economy in Blatina grape production was 1,25.
2. Profitability of Žilavka grape production was the highest in 2008 (31,15 %), and it was the lowest in 2006 (12,03%). The three-year average coefficient of profitability for Žilavka grape production was 20,78 %. Profitability in Blatina grape production is presented by the profitability coefficient which was the highest in 2008 (25,66 %) and it was the lowest in 2006 (15,95 %). The three-year average profitability coefficient for Blatina grape was 20,38%.
3. The economy of Žilavka wine production was 1,41 in 2006, 1,43 in 2007 and 1,47 in 2008. The economy of Blatina wine production was 1,42 in 2006, 1,44 in 2007 and 1,47 in 2008.
4. The profitability of Žilavka wine production was 29,06 % in 2006, 30,31 % in 2007, and 31,96 % in 2008. The three-year average coefficient of profitability for Žilavka wine was 30,44 %. The profitability of Blatina wine production was 29,81 % in 2006, 30,78 % in 2007 and 32,19 % in 2008. The three-year average coefficient of profitability for Blatina wine was 30,92 %.
5. The agicultural produce of Žilavka grape expressed by dynamic analises show positive tendency rise and an average rise of the agricultural produce was 1,365 t/ha. The agricultural produce of Blatina grape also shows positive tendency rise and an average rise was 1,250 t/ha.
6. Žilavka wine production expressed by dynamic analises trend shows positive tendency rise and an average rise was 750 l/ha . An average middle aberration from trend line in Žilavka wine production was 2,500 %. Blatina wine production also shows positive tendency rise and an average rise was 750 l/ha.

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Economics of agriculture
SI – 2
UDK: 631.11:353.1 (497)

# COMPARATIVE CHARACTERISTICS OF SOME BALKAN COUNTRIES RURAL REGIONS

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## Summary

*Defining rural area is the first step in shaping efficient development policy. There is no single universal definition, nor a typology of the rural areas. Moreover, in most Balkan countries, serious institutional efforts have not been made to classify populated areas as rural or urban, nor identify different types of rural areas. This paper makes a comparative analysis of various factors that are important for determination of the degree of rurality and main features of regional and rural development of some Balkan countries (Serbia, Montenegro and Croatia). One notices* that in a relatively similar natural-geographic and to some degree historic and developmental setting, similar socio-demographic processes are occurring in parallel. Difference in features and dynamics of these processes is resulting from different institutional approach.*
***Key words:*** *rural development, regions, typology, socio-demographic processes.*

## Methodological frameworks

The way we understand rural regions has evolved through time as the meaning of the term broadened. Originally, a rular region was viewed as a residual area of an urban centre. Simple understanding of rurality defined according to territory was refuted when it was accepted that rural region represents territorial entity with coherent economic and social structure of diverisified activities. Nowadays, predominant view is that a rural region represents a territorial unit, with one or more small/medium-sized towns surrounded by vast open space, with a relatively low population density and regional economic structure which reflects the state of affairs at a specific labour market.

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Contemporary positioning of rural development policy implies its emergence on the basis of a balanced regional development policy while relying on a unique set of agricultural policy measures, structural policies, industrial policy, tertiary sector development policy, health care policy, infrastructure policy and environmental policy in a specific area.

Territorial-administrative organisation of a country and the availability of statistical data considerably affect how the issue is approached. Important indicators are usually observed only at the national and regional level, while, the same indicators for lower territorial units often lack reliability, even for those sectors that are almost synonymous with rural areas (agriculture, forestry).

According to OECD typology, rural regions are classified into three groups, depending on what percentage of the population lives in rural communities: with more than 50% of the population - predominantly rural regions, with 15 to 50% of the population – significantly rural or intermediate regions, with less than 15% of the population - predominantly urban regions.

Regionalization in the European Union has been performed according to so-called NUTS classification (Nomenclature of Teritorial Units for Statistics), a geocode standard for referencing the administrative division of countries for statistical purposes in Europe[4]. However, regardless of the Eurostat definition, there are significant differences between EU countries. The definition of rurality used by the EU, initially based solely on population density, was improved by the introduction of more complex elements relating to the functional links between rural and urban areas. Accordingly, for example, LEADER project defines rural areas as groups of local communities with 5,000 to 100,000 inhabitants.

Eurostat approach to defining rural regions is made according to the degree of urbanization: densely populated zones - groups of municipalities, each with a population density greater than 500 inhabitants/km2, and a total population of at least 50 000 inhabitants; intermediate zones - groups of municipalities, each with a population density greater than 100 stanovnika/km2 (not belonging to a densely populated zone), sparsely populated zones - groups of municipalities that are not classified as either densely populated zones or inermediate.

In the outlined context, this paper comparatively analyses elements determining the level of rurality and the main features of regional and rural development of some Balkan countries - Serbia, Montenegro and Croatia.

4 Eurostat has defined three levels of NUTS (Nomenclature des Unités Territoriales Statistiques/Nomenclature of Territorial Units for Statistics): NUTS 1 – comprises regions with over 3 million inhabitants, NUTS 2 – for regions between 800 000 and 3 million inhabitants, NUTS 3 – for regions with less than 800 000 inhabitants. Since 2003. NUTS level 4 and NUTS level 5 have been renamed LAU levels 1 and 2 respectively (local administrative units - LAUs).

## Regions and rural areas in Montenegro

Regional development of agriculture represents significant feature of the overall regional development. As is the case with regional development in general, in contemporary theory and practice, it is defined as a complex and multidimensional phenomenon. Indeed, there is a complex correlation between interdependence and change, both between and within its individual dimensions.

Although spatial regionalization of Montenegro was not officially established by a legal act, in terms of statistical-economic or administrative aspects, nor in terms of determining specific names of regions and /or specific policies of regional development, in the spatial planning documents the country is usually divided into three major regions: (1) Northern or Mountainous region (municipalities: Andrijevica, Berane, Bijelo Polje, Kolašin, Mojkovac, Plav, Plužine, Pljevlja, Rožaje, Žabljak and Šavnik), (2) Middle or Central region (includes: Cetinje, Danilovgrad, Nikšić and Podgorica) and (3) Southern or Coastal region (which includes the municipalities of Bar, Budva, Herceg Novi, Kotor, Tivat and Ulcinj).

If the specified regionalization of Montenegro (the division into three regions) is to be taken as the basis for the Nomenclature of Territorial Units for Statistical Purposes, then the territory of the Republic of Montenegro, just hypothetically, could be organised as presented in Table 1.

*Table 1. NUTS – Hypothetical regional-rural organisation of Montenegro*

| EU standard | Montenegro | Methodological limitations |
|---|---|---|
| NUTS 1 | Montenegro | Macroeconomic indicators in line with international standards are available only for the Republic as a whole. Statistical series are not compatible within longer time period. |
| NUTS 2 | Regions:<br>(1) Northern<br>(2) Central<br>(3) Southern | The statistic data represents only a sum of data collected for municipalities. There are no elected representatives or authorities at this level that could carry out the policy of development. |
| NUTS 3 | Municpalities | Some municipalities were established after the 2003 Census, and for them there are no compatible data for all indicators. |
| NUTS 4 | Settlements<br>Villages | The total number of settlements is 1256. Out of which only about 40 settlements are of urban type, and the rest are villages (2003Census). Available statistics at this level refers only to demographic indicators. |

Generally viewed, according to all relevant criteria and indicators for determining the degree of rurality (OECD, EU), given that the average population density amounts

to only 45 inhabitants/km2 (Census 2003) and despite the fact that this indicator nearly doubled in the course of the past fifty years (27 inhabitants/km2, Census 1948), the whole territory of Montenegro could be considered as a **rural area**, or sparsely populated area. On the other hand, population living in municipal centers that could be considered as centers of urban settlements, has reached 56% (2003), which indicates that about 44% of the population lives in rural areas. According to the OECD typology, it means that the whole Republic of Montenegro can be classified as **significantly rural** or intermediate region.

However, if we look at population density and the share of agricultural population in the total population of municipalities, an extremely strong differentiation into significantly rural and predominantly urban areas is observed. Several municipalities in the North region (Kolašin, Žabljak, Šavnik, Plužine) are **extremely sparsely populated**, only 50-10 people per km2. These are also municipalities with the largest share of agricultural population in the total population (12% in Kolašin, up to 32% in Šavnik) and according to the typology of the EU, these areas could even be classified as **distant (remote) rural areas**, heavily dependent on agriculture, isolated due to geographical characteristics, where only essential services are provided. On the other end of a scale are a few municipalities of the Southern region (with the exception of the capital city) which could be, according to population density (more than 100 inhabitants per km2), classified as **medium-populated**, such as: Herceg-Novi (141), Tivat (296) and Budva (130) and Podgorica (117). At the same time, all municipalities (except Podgorica) have less than 1% of agricultural population.

The regionalization of agriculture in Montenegro, regardless of its relatively small size, due to its pronounced differences in relief, altitude, geological materials, diversity of climate, soil, biodiversity, has received attention of a number of authors and was the subject of different studies. By mid-seventies, the first attempts of agricultural regionalization have been made in a study on technical and technological bases of agricultural development /Lit.10. 1975/, and the regionalization of Montenegro was made so that the total territory was divided into 5 regions: I Coastal region (Herceg Novi, Kotor, Tivat, Budva, Bar and Ulcinj); II Zeta-Bjelopavlići region (Titograd and Danlovgrad); III Karst region (Cetinje and Nikšić) IV Polimlje-Ibar region (Plav, Ivangrad, Bijelo Polje and Rožaje); V Northern-Mountainous region (Kolašin, Mojkovac, Plužine, Šavnik, Pljevlja and Žabljak).

In the early eighties, one of more ambitious and successful regional development projects was the agricultural development project in Montenegro / Lit.5, 1983 /. The project paper was made in an effort to introduce the regionalisation of Montenegro from the aspect of production and market development, and the country was divided into five areas-regions: Coastal, Zeta-Bjelopavlići, Karst zone, Mountainous and Polimlje zone (the Lim river valley).

At the end of the eighties, in a study / Lit.12, 1989 /, the regionalization of Montenegro was carried out in accordance with two aspects: (a) first, from the standpoint of agro-echological conditions (taking into account the characteristics of soil, water resources and climate conditions), the territory was divided into **five agro-**

**echological regions**, regardless of their administrative municipal boundaries: Coastal, Zeta-Bjelopavlići; Valley region; Karst region and Mountainous area. (B) second, in addition to agro-echological conditions, three additional criteria were taken into account (altitude, the structure of agricultural land and population number changes in the period 1971-81). Thus, the division in **six "socio-economic regions"** was made: Plains region, Coastal region, Highlands, Highlands-Mountains region and Karst region.

Finally, agroecological regionalisation of agricultural areas of Montenegro, regardles of administrative divisions and municipal boundaries, was one of the most important analytical basis for the adoption of "Green Strategy of Montenegro“ as an important planning and development document / Lit.14, 1992 /, which formulated the policy of agricultural development of Montenegro in accordance with new market fundamentals.

Application of more exact methods in the regionalisation of agriculture and regional development was not widely practiced in the territory of former Yugoslavia, although a few such projects were conducted in Serbia / Lit.6, 1990 / and in Bosnia and Herzegovina / Lit.9, 1986 /. There have been attempts to pepare regionalization of the territory of Montenegro, according to conditions for agricultural production, by using measurable criteria, indicators and mathematical and statistical methods / Lit.3, 1990 /. Finally, we come to a conclusion that the territory of Montenegro includes several areas, regions and subregions: I **Mediterranean area**, covers two quite homogeneous region: 1 Coastal municipalities, 2 Zeta-Bjelopavlići region (Podgorica and Danilovgrad). II **Karst area**, due to specific agroechologic and especially pedologic features, is considered separately from the hilly-mountainous areas, and includes the municipality of Cetinje and the municipality of Nikšić. III **Hilly-Mountainous area**, that covers two major regions: 1 Central Mountain region (Mojkovac, Kolašin, Šavnik. Žabljak and Plužine), 2 North-East region, where we observetwo homogenous subregions: a) Polimlje (Ivangrad, Bijelo Polje and Plav), b) Pljevlja-Ibar sub-region (Pljevlja and Rožaje).

This type of division into regions and subregions can not be regarded as definitive agricultural regionalisation, as it is largely determined by the existence of administrative boundaries. However, regardless of numerous restrictions, it could and can be observed as a framework for regional streamlining of agricultural production in Montenegro.

## Regions and rural areas in Serbia

In the Republic of Serbia, in 1990s, there were several attempts to improve territorial and spatial organisation, namely through the Spatial Plan for the Period until 2010 and the Law on Underdeveloped Areas for the period until 2005. Main strategic goal of the Spatial Plan was to achieve higher level of total functional integration of the area of the Republic of Serbia and provide for the conditions necessary to achieve better transport and economic connections with neighbouring countries. It required alleviation/decrease of regional disproportions, i.e. qualitative changes in spatial, economic and social structure.

The Spatial Plan also included the development of rural settlements as multi-

functional productive, social and cultural areas. The classification of areas moves from the principle of homogeneity as regards the level of economic development. The parameters used were the national income, employment level, turnover in the retail sector and the development of the PE of PTT Communications "Serbia" post company network. Further criteria that were taken into consideration were the altitude of the settlement, distance from the state border, type of the settlement (rural or urban), and its inclusion in special development programmes.

However, it should be emphasised that the term "region" herein is in line with the definition of the regions laid down in the Regional Development Strategy of the Republic of Serbia 2007-2012 as "units of a local self-government in the area of administrative districts" (defined in the Law on State Administration), but it is not in compliance with the definition used in the European Union where the "region" refers to a statistic (economic) region. New (European) definition of the term "region" was used for the first time in Serbia in the Law on Regional Development adopted in July 2009. In line with NUTS regionalisation models, there are 24 districts, plus the territory of Belgrade, in Serbia (Kosovo and Metohija excluded), which would be classified as NUTS 3 level. For rural development, it is necessary that at this level there are neither elected authorities nor executives which would implement rural development policy. The territory is further divided into 165 municipalities (some of them got the status of a municipality after the 2002 Census). Total number of settlements in Serbia (K&M excluded) amounts to 4.718, out of which 181 settlements have the status of towns. The statistics available at this level refer only to demographic indicators.

Most comprehensive data on rural areas originate from the Census of population, households and housing and from the Census of Agriculture. This means that main indicators of rural areas refer only to the time period of ten years, and the classification unit is a municipality.

*Table 2. Main features of rural and urban areas in Serbia*

| | Urban | | Rural | |
|---|---|---|---|---|
| | *Total* | *% (Serbia=100)* | *Total* | *% (Serbia=100)* |
| OECD definition ( <150 inhabitants /km$^2$) | | | | |
| Population density | 299.80 | | 64.59 | |
| Total territory | 11072 | 14.29 | 66402 | 85.71 |
| Population 2002 | 3291310 | 43.90 | 4206691 | 56.10 |
| Agricultural land | 771520 | 15.90 | 4341787 | 84.91 |
| Forest land | 171965 | 9.13 | 1711781 | 90.87 |

*Source: Lit.1, 2007.*

According to these criteria, over four fifths (85%) of the territory of the Republic of Serbia could be considered rural, since over 56% of the total population of the Republic of Serbia (2002) is living on the territory. The analysis of the above listed results indicates that OECD criteria that measures rurality based on population density reflect the image of rural Serbia to a satisfactory extent. These criteria could be complemented with new criteria and scales referring to the size of settlements, due to the fact that without this limitation rural areas would include municipalities with great differences in the number of inhabitants and the size of the territory they comprise.

Rural Development policy in Serbia should be based on well-known features of the rural territory and the population inhabiting it. Area classification in this regard forms the basis for rural area typology, and consequently, Rural Development policy. / Lit.13, 2005/.

## Regions and rural areas in Croatia

Difference between rural and urban areas in Croatia is made in accodance with the territorial division by which smaller administrative units – municipalities, are considered rural, whereas towns are considered urban areas. According to this administrative criterion, out of the total population of 4.437.460 (Census 2001), around 44,4% (1.971.005) of the population is regarded as rural, and 55,6% (2.466.455) as urban population /Lit.11, 2008/. At local level, (municipalities, towns)[5], areas are classified as rural or urban based on the threshold of 150 inhabitants/ $km^2$. At regional level (NUTS 3 – counties), OECD defines three groups of areas depending on the share of the population in the region living in local rural areas: mostly rural regions (over 50%); significantly rural (15-50%) and mostly urban regions (less than 15% of the region's population live in local rural areas).

5 "In Croatia there are two levels of political-territorial organisation: municipalities as units of local self-government and counties as units of regional self-government. According to the provisions of the Law on Territories of Counties, Towns and Municipalities from 1992, territory of the Republic of Croatia was divided into twenty counties and the City of Zagreb. According to the abovementioned Law from 1997, the number of municipalities was reduced from 424 to 416, and the number of towns/cities increased from 75 to 122. In compliance with the Law, certain municipalities disappeared, and others were founded, and 47 municipalities gained the status of towns. Now, there are 123 towns/cities registered and 564 municipalities " /Lit.15, 2004/.

*Table 3*. Rural and urban areas in Croatia

| Classification | OECD Criterion, 150 inhabitants/ $k^m2$ | | | | | |
|---|---|---|---|---|---|---|
| | Surface $km^2$ | % | Number of settlements | % | Number of inhabitants | % |
| **Rural areas** | 51.872 | 91,6 | 6.001 | 88,7 | 2.110.988 | 47,6 |
| **Urban areas** | 4.731 | 8,4 | 763 | 11,3 | 2.326.472 | 52,4 |
| **Total** | 56.603 | 100 | 6.751 | 100 | 4.437.460 | 100 |

*Source: Lit.11, 2008.*

As the Table 3 indicates, according to the OECD criteria, the following can be concluded: (a) 91,6% of the total territory of Croatia are classified as rural areas, and 8,4 % as urban areas; (b) 88,7% settlements are located in rural, and 11,3% in urban areas, with 35% of the population living in 14 towns with over 30.000 inhabitants; (c) 47,6% of the total population live in rural, and 52,4% in urban areas.

Strong negative growth rate of the population living in rural areas is the result of a relative and/or absolute aggravation of life conditions of young families and growing trend of migration into urban centres or more perspective rural/tourist regions. Educational level of the population living in rural areas as compared to urban areas is much lower, on average. In some counties, almost every third adult person living in a rural area has only primary school education.

Main feature of Croatian rural areas is a poor access of the population to basic infrastructure. All main indicators of whether the rural population is provided with infrastructural conveniences or access to basic infrastructure (e.g. the number of phone lines, number of post offices per 1000 inhabitants, density of roads and railway tracks per 100 $km^2$, etc.) are much lower in rural than in urban areas. Also, life conditions of the rural population are in the majority of the regions much worse than those in urban areas, e.g. urban households are to a higher extent equipped with bathrooms, electricity, water, sewage system, etc. than the rural ones. /Lit.11, 2008/.

## Conclusions

Features that characterise regional rurality in the countries concerned, besides the fact that they indicate extreme differences on such a small area, also reveal their significant resemblances. In Montenegro, according to average population density (45 inhabitants/km2), the whole territory could be considered as a rural area, i.e. rarely inhabited zone; several municipalities in the North of the country are extremely rarely inhabited (5-10 inahabitants/km2), but with large share of rural population in the total population (up to 32%); in the South, municipalities have less than 1% of the rural population in the total population number. In Serbia, basic features of rural and

urban areas, according to the OECD criteria, indicate that over four fifths (85%) of the territory of the Republic of Serbia could be considered rural, with over 56% of the total population living in it (2002). In Croatia, according to the same criteria, around 92% of the total territory is classified as rural areas, with 88% of settlements located in them, and 48% of the total population living in rural areas.

In comparative analysis of rural areas development, region-specific features should be taken into consideration, based on improvement of an appropriate harmonised methodology. More detailed mapping of the region could provide for a clear insight into possible forms of support to rural economy diversification and promotion of a sustainable regional development. Thus, Rural Development Programmes could not only be developed, but also updated and improved, through reciprocal cross-border regional experiences, through various economic activities related to multifunctional farms and diversification of a wide range of "post-industrial" socio-economic out farm activities.

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Economics of agriculture
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UDK: 334.73 (497.113)

# AGRICULTURAL COOPERATIVES IN A.P. VOJVODINA - POSITION, POTENTIALITY AND PERSPECTIVES

*Jelena Nestorov Bizonj,[1] Velibor Potrebic,[2] Željko Arsenijević[3]*

## Summary

*This paper discusses some of the basic data which define the current situation, potentials and prospects of agricultural cooperatives in A.P. Vojvodina. Agricultural cooperatives are a key factor in sustaining and improving the competitiveness of agricultural producers, in terms of increasing competition, which occurs as a result of the approaching process to the European Union.*

*The potential of agricultural cooperatives in the past and the present has not been adequately exploited - for many reasons - some of which are the primary legislative framework is inadequate, and the system and economic position of cooperatives in economic policy in agriculture, but also the overall economic policy.*

*Prospects of agricultural cooperatives are conditioned by the creation of adequate legal, institutional and economic environment for their business, which will significantly influence the effects of the cooperative organization of agricultural producers.*

***Key words**: agricultural cooperatives; agricultural producers; competitiveness.*

## Introduction

A.P. Vojvodina is one of the regions with the longest tradition of cooperative organization in the world. The history of agricultural cooperatives in A.P. Vojvodina, 164 years long, testified about the need of farmers for this type of business organization, regardless of the state system and socio - economic environment for business cooperatives.

The need for a cooperative organization, as in the past and today, exists especially for farmers with small farms - which have not the capacity for independent approach to the market. Size, economic strength, productivity and degree of commercial

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orientation of agricultural holdings in Serbia are below average compared with the same characteristics of farms in the states of the European Union. Result of its characteristics is the low competitiveness of farmers from Serbia, which in the process of joining the European Union, may be the main factor in their disappearance from the market. One of the main ways to improve the competitiveness is the business association for the purpose of joint participation in the market, which gained a better position in the relations between supply and demand in relation to independently participate in the market. Agricultural cooperatives are the most effective form of business association of farmers, and there is a need to improve their potential in this area, so that members of cooperatives achieve the best effect of the joint business through the cooperative form of organization.

Some of the basic preconditions for the successful dealing of cooperatives are: modern cooperative legislation that would regulate the problems of property relations, management and other key factors that define any economic entity, the existence of long-term strategy of agricultural development and agricultural cooperatives with a defined role of cooperatives in economic policy in agriculture; and stimulating cooperative organization and business through a system of measures aimed at increasing the competitiveness of farmers and cooperatives.

Perspective of co-operatives, and thus the future of farmers with small and medium farms will most determine the attitude of the state to regulate areas that are now inadequate for the development of cooperative movement.

## Basic information about agricultural cooperatives in A.P. Vojvodina

According to data from the Cooperative Union of Vojvodina, of 526 agricultural cooperatives - members of the Union, which in the Business Registers Agency recorded as active entities, in the reality is active about 440 agricultural cooperatives.

Of total number, about 190 agricultural cooperatives, was established in the years after World War II, and other cooperatives were established since 1990. until today. Cooperatives with long standing tradition have the most of the human and property capacity in the cooperative movement, but also major problems in doing business in relation to cooperatives that were established in the last two decades. However, these cooperatives still are the place of association for most cooperative members and contract farmer.

Human resources in agricultural cooperatives are cooperative members, contract farmers, and employees. According to data from the Cooperative Union of Vojvodina, the 440 active agricultural cooperatives in the A.P. Vojvodina has about 20,100 members, about 90,850 contract farmers and more than 5,100 employees. Cooperatives have an average of about 45 of its members and about 200 contract farmers, meanwhile the number of members and contract farmers significantly different from the average among the cooperatives have a long tradition in relation to cooperatives that were established in the last two decades. "New" cooperatives usually have between

10 and 15 of its members and a varying number of contract farmers (often less than the average). The average number of employees in agricultural cooperatives is about 15 persons, excluding the 88 cooperatives that have no employees.

Most cooperatives with a long tradition has movable and immovable property owned by cooperatives, and in these cooperatives is the largest number of employees, cooperative members and contract farmers in the cooperative sector. Cooperatives that were established in the last two decades often do not own property in cooperatives ownership, and thereby employ the minimum number of employees, or do not have employees, but work is performed by its members who are not employed by the cooperative. Of this there are exceptions, and the some agricultural cooperatives that were established during the period 15-20 years ago, to this day created considerable material resources and have professional and qualified staff, as well as with some agricultural cooperatives with tradition occurred outflow of capital, lost property and personnel in the same period.

Immovable property has 140 agricultural cooperatives, consisting agricultural lands and / or buildings. Agricultural land is owned by about 100 cooperatives. A large part of the cooperative property is due to statutory changes in the second half of last century, transferred to other legal entities (agricultural enterprises and combines), and then the unfortunate legal provisions on restitution of property of cooperatives remained outside of the cooperative sector, which is done irreparable damage to agricultural cooperatives.

In terms of activities, most of the agricultural cooperatives in A.P. Vojvodina is a multifunctional type, that is not specialized in manufacturing and trading of certain types of agricultural products. Operations of agricultural cooperatives is conducted through contracting production with members and contract farmers, including provide of materials and providing services for its members and contract farmers, storage and sale of their product, and purchase of agricultural products. In addition to contract manufacturing and purchase, a significant number of cooperatives has its own production. The largest part of turnover is achieved through cooperative production and trade of conventional crops, with increasing participation of fruit and vegetables, and decrease livestock products in the total turnover in recent years.

## The agricultural cooperatives - the potential for improvement competitiveness of farmers

Individual agricultural producers in Serbia are in possession of more than 85% of agricultural land. About 700,000 households (about 95% of total) have less than 10 ha of agricultural land, and only 5.5% of households have more than 10 ha. The data is striking that in our agriculture is dominated by small farms, whose size is far below the European average, while dominated by extensive production on small parcels. On the other hand, given the total area contained in the individual private sector, it is clear that the status and development in agricultural production are influenced by economic success of individual agricultural producers.

Based on data on the size, structure and activities of agricultural holdings, it is concluded that our farms have very weak economic power, and without association in agricultural cooperatives can not survive in the market for a longer period. Business networking in cooperatives to jointly market approach is particularly important in conditions of complete opening of our markets for agricultural - food products from the countries of the European Union, which is in progress, but their productivity and competitive position in the market on average, significantly better than on domestically produced goods.

Apart from the need to improve competitiveness, the basic role of cooperatives for many farmers with small farms and simple to maintain production and productivity, because without the natural borrowing for needed raw materials from cooperative would not have the financial capability and the establishment of new production.

In the A.P. Vojvodina, on average there is one agricultural cooperative in each settlement. In some villages there is more than one cooperative, and in few places cooperatives does not existed (or a cooperative that does not operate). It can be concluded that there is a good network of cooperative organizations in rural areas, and already there are organizations through which farmers are linked to business performance in the market. In the last decade there was a continuing interest in the establishment and development of new cooperatives, which means that farmers recognize cooperatives as business entities for the common market. Bearing in mind the existence of an adequate network of cooperative organizations, the question is to what extent the existing network of cooperative organizations use to achieve greater competitiveness of the farmers market. Cooperatives are a factor of survival for many farmers with small farms, and certainly contribute to increasing their competitiveness, but far below the capacity of the cooperative form of organization has, due to the lack of an adequate socio - economic and legislative framework and appropriate economic policy measure in agricultu rebusiness cooperatives.

## Perspectives and limitations for successful business agricultural cooperatives

Perspectives of agricultural cooperatives in Serbia are significantly conditioned by the existence of interest to the cooperative organization on the one hand, and the need to ensure adequate legal, market and general socio - economic environment for cooperatives business, on the other side. Interest in the cooperative organization is evident, however, conditions for successful cooperative business limited number of subjective and objective factors.

Without neglecting the subjective weaknesses in cooperatives, such as unfavorable qualifications of staff, lack of preparation for the business in line with modern market and production conditions, problems in governance and management, etc., are still the dominant objective factors in achieving the conditions for the smooth operations of cooperatives.

Most restrictions in business, cooperatives have because due to decades state had inadequately attitude to the cooperative movement, which is reflected in:

- Lack of a modern legal framework for cooperatives operating. Specifically, the legislation for all forms of business organizations (as well as entrepreneurs, and associations) in the period of transition adapted to the needs of the modern market economy, except legislation in the cooperative movement. New, modern cooperatives law is one of the preconditions for the successful operation of cooperatives, particularly because it is necessary to regulate the ownership and management of cooperative relations;
- The existence of social ownership of real estate multiple damage the cooperative system. Disregard for cooperative property, which is the Constitution of the Republic of Serbia is one of the anticipated types of property, and on the other hand the existence of social ownership in the cooperatives, which in the Constitution of the Republic of Serbia does not exist, representing a negative relationship between state legislation to cooperatives. Social ownership and cooperatives have limited control, the inability to use the property in a rational purpose, but in accordance with limited opportunities. Unfortunately, social property is the limit for new investments in the cooperative sector, due to undefined and uncertain property rights over the property;
- Lack of long-term strategy of agricultural development, inadequate economic policies in agriculture, followed by lack of measures aimed at stimulating cooperative forms of organization in agriculture; - Other circumstances that adversely affect the operations of cooperatives (high level of informal economy in agriculture, vulnerability of domestic production of imported goods, lost markets in the past decades, etc..).

Perspectives of agricultural cooperatives in our country to a large extent will be determined according to the present state policy according to cooperatives. Bearing in mind that within the European Union co-operative form of business in agriculture is dominant in all market segments, our cooperative system would quickly be adapted to European trends, in order to effectively protect the interests of farmers joined in a cooperative. The vitality of the cooperative system has proven to us through its history, and the prospect of its existence certain, but capacity utilization and efficiency of the cooperative system to protect the interests of farmers and improve their competitiveness may be more or less successful depending on the general economic environment for business cooperatives.

## Conclusion

The need for the development of agricultural cooperatives in A.P. Vojvodina is illustrated by the fact of the existence of a large number of farmers with small farms who can not act independently in the market. The necessity of linking in the cooperative system of organization in order to perform the market in this region is traditionally the most common form of agricultural producers operating, who has survived various socio - political and economic system, as well as a changing business conditions. The challenges that are opening before our agricultural producers are all higher in the process of conducting the expected association process to European Union, mainly because of

facing strong competition, but here and other specified conditions (standardization, methods of production, transport, storage, packaging, marketing, etc.). Cooperative system of organization has the capacity to assist farmers in achieving their economic success in these processes, provided that adequate conditions to exercise the legislative, and general economic environment for cooperatives business. In addition to adopting a new, modern law on cooperatives, the system of economic policy measures in agriculture, which would be aimed at stimulating business association and the cooperative system, with the possibility of profitable investment in the cooperative, to achieve conditions that lacks the recognition of the cooperative movement, in the interests of farmers but the agricultural sector as a whole.

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Economics of agriculture
SI – 2
UDK: 316.334.55:330.341.22 (497.11)

# FEATURES AND SPECIFICITIES OF THE REGIONAL RURAL DEVELOPMENT IN THE REPUBLIC OF SERBIA

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## Abstract

*All rural areas in the Republic of Serbia, and overall life, work and development in our country, have a number of its characteristics and peculiarities. It is primarily expressed in the great wealth of natural and human resources, and through various economic activities, with significant material and cultural goods and more, with distinct characteristics, trends and diversity in some areas or regions in our country.*

*In addition, it should be noted that in Serbia in all areas, including the rural, there is enormous potential for a better life and work, as well as for the overall development and progress. However, due to various factors, and most often personal, peripheral and irrelevant, it's mostly been implemented or are now doing. For this reason, among others, and today there are significant disparities and imbalances in economic, technological, social, cultural and other levels of organization and development between different parts of Serbia - from north to south and from west to east of the country, which certainly can and must mitigate or overcome in a different environment and circumstances, which the authors wish to point out in this paper.*

***Key words :*** *Rural development, Serbia, population, area, regions, resources, strategy*

## Introduction

Rural areas in Serbia are defined as the space whose main physical and geographic characteristics are use of the land for growing and producing agricultural and forestry products. In this region, the majority of natural resources with rich ecosystems and biodiversity, significant human resources, various economic activities, significant natural, material and cultural goods, historical heritage are concentrated.

Rural areas in Serbia are defined according to OECD criteria, with population

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density of 63 people per km², with the criterion for establishing rural areas in EU – population less than 150 inhabitants per km². According to this definition, rural area in Serbia is spread on 75 – 85 % of the total territory, and at least 130 municipalities are characterized as rural areas, which include 3,904 settlements, noting that in our country (excluding Kosovo), there are 20 cities and 165 municipalities, which have 4706 villages.

According to the opinion of Prof. Dr. Natalija Lj. Bogdanov, rural areas are characterized by a high degree of differentiation in the aspect of natural, infrastructure and other conditions for agricultural production and development of other economic activities, proximity of the market and conditions for market placement of products, as well as in terms of the size and morphology of the settlement etc. This differentiality is also shown in the plan of economic and social growth, demographic characteristics and trends, cultural and other characteristics, which has a particularly strong impact to the economic efficiency and quality of life.[3]

All rural areas in Serbia, as well as overall living, work and development in them, have a series of their own characteristics and specificities, about which we will try to say something in this paper.

## Classification and regionalization of rural areas in Serbia

In the literature from the second half of XX century, the whole rural area of Serbia was generally classified into three areas: lowland, hilly-highland and mountain area.

A more complete division of the territory of Serbia was provided by Prof. Dr. Petar Marković (1994), who has defined four agricultural »macro regions«, and those are the following:

1. Lowland – up to 200 m above see level;
2. Lowland-hilly – from 200 to 500 m above the see level;
3. Hilly-highland – from 500 to 1000 m above the sea level;
4. Mountain – more than 1000 m above the sea level;

In the classification of agricultural areas in Serbia, Dušan Radmanović (1995) lists the following five rural areas:

1. Lowland (plain) – up to 200 m above the sea level;
2. Hilly – from 200 to 300 m above the sea level;
3. Highland – from 300 to 600 m above the sea level;
4. Pre-mountain – from 600 to 800 m above the sea level;
5. Mountain – more than 800 m above sea level.[4]

Thus, according to this classification, the lowland includes 67, hilly area 7, highland 39, pre-mountain 32 and monutain area includes 76 municipalities in Serbia.

Depending on various natural conditions for agricultural production and the existing

3 Prof. dr Natalija Lj. Bogdanov, „Mala ruralna domaćinstva u Srbiji i ruralna nepoljoprivredna ekonomija", UDNAP, Beograd 2007., pp. 24

4 Ibid pp. 26

specificities of socio-economic development, the authors of the monograph »*Mountain area in Serbia and bases of agricultural development*« also list the following »rural regionalization«:

1. Region of Vojvodina – the most developed agriculturally with a complex crop-lvestock production;
2. Region of the Great Morava – the basins of Great Morava, Mlava and Pek, which is characterized by mixed agricultural production;
3. North-West region – it includes Mačva, Pocerina, Kolubara and Podgorin;
4. East region – includes the basins of the South Morava and Timok with Podunavlje, upostream to Golubac;
5. South-West region – includes an extremely mountainious area of South-West Serbia, which is not exactly the best one for agricultural production;
6. Belgrade region – includes the area around Belgrade;
7. Kosovo and Metohija region – a significant hilly-mountainous area, with two vast plains – Kosovo and Metohija.[5]

However, the authors of this paper believe that such a »rural regionalization« is not complete and that certain corrections, adjusments and additions that refer to the areas that were not included are necessary in this case, for example:

1. Šumada region – in its already known borders – surrounded by the rivers Kolubara, Dičina, West and Great Morava, Dunav and Sava;
2. Raška region – within borders of today's Raška district (or the regions of Kopaonik and Pešter);
3. Separation of the Eastern region into East Krajina and South Serbia (Nišava, Toplica, Jablanica and Pčinja);
4. Zlatibor region (or Zlatigora region) – within borders of today's Zlatibor district.

Some authors, such as Branislav Gulan, point out the following regional division: *»In the economic structure of Serbia, two types of regions are clearly distinguished: urban-industrial and agro-rural«*.[6]

Of course, all those regional units in the rural area of Serbia (smaller or bigger), with the appropriate clasifications and categorizations, should be coherent and in accordance with the basic EUROSTAT clasifications and standards (NUTS 2 i NUTS 3), which exist in almost all the countries of Europe. As for the Republic of Serbia, there are still many misunderstandings, fumblings and obstructions, although there was a new (amended Law from 2009) Law on Regional Development adopted in 2010, which anticipates five statistical regions: Vojvodina region, Belgrade region, Šumadija

5 Isto, str. 23

6 Branislav Gulan: »Possibilities and perspectives of rural development in the area of large minings«, 2008, original work at the International Scientific Meeting at this subject in the spa Vrujci, Serbian Chamber of Commerce, Belgrade

and West Serbia region, South and East Serbia region, Kosovo and Metohija region.[7] In addition to the expressed common features that characterize them and place them under one »district or regional rural cap«, the majority of areas have more common problems, such as:

*»Problems of regional development of the Republic of Serbia consist of the disproportions between development levels of individual areas, underdevelopment of a large number of municipalities, structural incompatibilities, insstitutional problems, unfavourable demographic movements and numerous material limitations, etc. Regional disproportions in development level in the Republic of Serbia, meaured by achieved national income per capita (excluding Belgrade municipalities) are the highest in Europe and they are increasing each year, so that the ratio of the most and the least developed municipality is increased from 1:19 in 2000, to 1:27 in 2005* (source: Central Bureau of Statistics, »Municipalities in Serbia«, Belgrade 2006).«[8] in this case, the example of Belgrade is cited, in which 21% of total population today lives (on 4% of the territory), where 29,7% of working population is employed and which participates in creation of national income of the Republic of Serbia with 33,7%, which is much more than other regions in our country.[9]

## Classification and typology of the rural area in Europe

In Europe, and especially the member countries of European Union, there are clear and precise criteria for classification and typology of their rural area. In that way, according to the definition of rurality, OECD distinguihes two hierarchical levels of territorial units: local and regional.

According to OECD typology, rural regions are divided into two groups:

• predominantly rural regions – the regions in which more than 50% of the population lives in rural communities;

• significantly rural regions or transitional regions – the regions in which less than 15% of the population live in rural communities;

• predominantly urban regions – the regions in which less than 15% of population lives in rural communities.[10]

In the definition of rurality, which is applied by EU, according to the document Agenda

7 M.A. Milutin Matić, one of the authors, has been, among the others, dealing with issues of regionalization and decentalization of the Republic of Serbia for a long time, and he considers that it is necessary to constitutionally and practically define and form seven (eight) political regions in our country (according to the NUTS 2 standards): Vojvodina, Belgrade, Šumadija, West Serbia (Podrinje, Podgorina and Zlatigora), Raška (Kopaonik and Rasina), East Krajina and the Old (or South) Serbia (Ponišavlje, Jablanica and Pčinja), with Kosovo and Metohija as the eight region, which can be seen in other papers of his.

8 Branislav Gulan, Specified paper, pp. 5

9 Ibid, pp. 5

10 Prof. dr Natalija Lj. Bogdanov,Specified work, pp. 8

2000, as stated by the Professor Bogdanov, rural areas are divided into:
• integrated rural areas – areas with the highest employment in secondary and tertiary sector, growing population and potential danger for the living environment, social and cultural heritage;
• transitional rural areas – areas that are relatively remote from urban centers with various mixtures of primary and secondary sector;
• remote rural areas – areas with low population density, very dependent on agriculture, isolated due to geographic characteristics in which only the most necessary services are provided.[11]
According to EUROSTAT, rural regions can also be defined on the basis of the criterion that refers to the level of urbanization:
• densely populated areas – groups of municipalities, out of which each has population density greater than 500 inhabitants/km2 and total population greater than 50,000.
• medium populated areas – groups of municipalities, out of which each has the population density greater than 100 inhabitants/km2 (and which is not in a densely populated zone). Total population of the zone needs to be at least 50,000, or it needs to border a densely populated zone.
• sparsely populated zones – group of municipalities that are not classified in densely nor medium populated areas.

## Rural area – a great potential of Serbia

In the rural area of Serbia, there were always great potentials, which were previously used according to the possible conditions and circumstances. Certainly, that can and will be used today, in order to follow global international trends again, with great possibilities for future significant reconstruction and development of the total rural area in our country. We state only a part of it:

a) From the total of 7,497,950 inhabitants, who live in the Republic of Serbia (excluding Kosovo and Metohija), about 3,272,000 inhabitants, i.e. 43,64% of total population live in villages. In Serbia, there is more than 4300 villages and 178 cities, about 778,000 listed, and 380,000 registered village households.

b) Serbia disposes with about 5,100,000 ha of agricultural land (0,68 ha per capita), which is above the standards of many European countries (Netherlands 0,06 ha, Germany 0,19 ha, Italy 0,20 ha, France 0,33 ha, Denmark 0,50 ha, Hungary 0,51 ha).

Unfortunately, in the previous few years, 500-600,000 ha of agricultural areas per year were always left fallow and unused.

v) In Serbia, there i about 400,000 tractors, 25,000 harvesters and more dozens of thousands machine tools. In addition, it has to be mentioned that this agricultural mechanization is older than two decades, on the average.

g) Agriculture participates in gross national income with about 21%, it employs

11 Ibid, pp.9

more than 10%, and about 21% participates in the export.

Unfortunately, today our country is, according to the number of livestock, primarily cattle and sheep, at the same level as in 1910. At the moment, about 1.1 million head of the cattle is grown in Serbia, which is for 41% less than in 1990. The largest decline is in sheep-breeding, which has 2.5 million head of sheep in 1990, and today there is about 1.5 million of sheep in Serbia.

In addition, the other strategic sources and potentials that exist in the rural area of Serbia are especially important, such as:

- Agricultural land, with all its crops and yields, as well as other natural advantages,
- water and water resources (for e.g. more than 1.000 springs of hot and cold mineral and curative water, more than 160 thermo-mineral settled and exploited spas and health resorts, etc),
- Forests and other potentials related to forests and their environment (according to the official data, in Serbia there is about 29.50% of forest),
- Mineral wealth, wonders of nature, etc,
- Biodiversity, diverse flora and fauna, etc,
- Sources of alternative energy (wind, sun, water, bio-energy, etc),
- travel potentials and offers, and especially spa and rural tourism,
- Cultural and historical heritage, various material goods, infrastructure, etc,
- Atmospheric and climatic conditions,
- Tradition, knowledge, culture, human resources, etc.

## The main features and trends in rural areas

In the Republic of Serbia, as main features and trends, primarily, the following can be considered:

- *Negative demographic trends* with strong migration movements from villages to towns, due to the so-called *agrarian exodus,* with the parallel faster growth and development of other sectors of economy, and especially the industry – until the great global changes in the end of the XX century (until the Fall of the Berlin Wall, symbolically).
- *Low diversification degree* of economic activities in rural areas of Serbia, which result in a series of problems in employment.
- *Agriculture* still remains the dominant activity in most rural areas, which are characterized by smaller agricultural households, *low productivity rate* and low income of the household.
- *Unemployment rate* in rural areas is rather high (21%).
- *Capacities of agricultural and food sector* related to the agriculture have declined dramatically during the 90s.
- *Infrastructure* in rural areas, both economic and social, is weak and underdeveloped.
- *GDP per capita in rural areas* is 74% from the national average and it is significantly below GDP per capita in urban areas.
- Rural population faces a high degree of poverty; about a million people in rural areas

live below the poverty line with US $ 2/day.
- In terms of *environmental protection*, rural areas in Serbia are rich in ecosystems and biodiversity, which are marked as protected areas (national parks, protected areas), with relatively preserved environment, with great and constant threat of increased pollution.

## The diversity of rural areas

Rural areas in Serbia today are different in many aspects – economic, social and demographic, the changes in population, economic structure, infrastructure, environmental conditions, availability of transport, with its special characteristics and peculiarities, etc. In that way, in accordance with this criteria, for example, we can distinguish four diverse types of rural areas:

*Region 1* – Highly productive agriculture and integrated economy – this region has favourable soil and climate conditions and quite an appropriate structure of agricultural production. This region possesses an adequately developed human potential, expressed entrepreneurship, sufficiently diversified industry sector and well-developed physical and economic infrastructure.

*Region 2 – Sectors of economy, typical for smaller urban areas with agriculture in which labour is intensively used* – this region includes the surroundings of the urban centres and larger cities and their environment. Taking into account the proximity of these environments to the market with a large number of consumers, the structure of agricultural production in them is directed towards intensive agricultural production of fruit, vegetables and animal products.

*Region 3 – Branches of industry directed to the use of natural resources, mostly mountain areas* – according to their geographic characteristics, this „region" is very heterogeneous. Its economic structure is based on the exploitation of rich natural resource – mining and agriculture. Unfavourable demographic trends are special characteristics of this area. This region includes the territory of Serbia, which has the highest rate of rural poverty and total unemployment.

*Region 4 – Great tourist capacities and bad agricultural structures* – This „region"represents the part of Serbia which has the greatest potential for tourism and the highest participation rate of the tertiary sector in economic structure. Structure of agriculture is rather undeveloped and mostly based on the use of the existing and available natural resources etc.

There is much other diversity, which are not included in this paper.

## Rural development strategy of the Republic of Serbia for the period 2009-2013

Strategic and regulatory framework of the rural development, with defining a lot of questions from that domain, is indicated in several documents, primarily the

Regional Development Strategy for the period 2009 – 2013 and in National Strategy for Sustainable Development, as well as the Regional Plan and Law on Agriculture and Rural Development of the Republic of Serbia. Thus, the Regional Development Strategy contains „*Vision for rural Serbia"* until 2013, in which three „sub-visions" are presented: the first – for the agricultural sector, the second – for food industry and marketing and the third – for rural economy of the Serbia as a whole, and for this paper, the third one is important, which states the following:

- Existence of sustainable and strong community, with demographic balance, satisfactory income and sufficient possibilities for employment, in which the inhabitants are easily adapted to economic, social, political and ecological changes (live village)
- Living standards and quality of life is worth of a modern, democratic and developed Serbia (advanced/successful village)
- The largest possible number of agricultural households and family farms is retained in villages (agricultural sector in rural economy)
- Equal possibilities for all the inhabitants of rural areas, especially women and children, which will have the access to education, vocational training and lifelong learning (socially just village)
- Rural communities actively participate in the work of relevant bodies that make the decisions, in the society based on the principles of equality, gender equality and social justice (democratic village)
- Cultural identity of rural communities, as well as their principles, customs, tradition and »fellowship«, preserved and improved, strengthened and adapted to the new time and values (village with cultural identity)
- Natural environment, which represents the most significant value and wealth of the population rural areas, needs to be respected, protected and improved; growth of rural economy is based on the principles of sustainability (sustainable village)
- Strong social cohesion and specific policy measures contribute to the reduction of poverty and social exclusion (social component of the village).

## Conclusion

According to the established European criteria, the Republic of Serbia is mainly rural country (75-85% of the total territory), with all its characteristics and specificities. The whole rural area in our country is expressed, primarily, in the large century-long abundance of natural and human resources, in diverse and significant economic activity of the population from all previous generations, in all of their previously acquired material and cultural resources and heritage, in the interesting history and rich tradition, with own values, moral, pride, spite, etc.

In rural, as well as all the other areas in Serbia, there certainly is significant material, spiritual and value basis, with good conditions for a much better life and work of all the inhabitants, as well as the faster overall development and progress of the state and

society as a whole. However, due to diverse factors, most frequently irrelevant and non-essential, it was not acquired, in the same way as it is not acquired today. And now – at the beginning of XXI century, among other things, there are big disproportions, disparities and imbalances in development, and thus in the conditions for life and work in those areas, with all its difficulties and consequences. All of that needs to be changed and overcome. We need only different environment and circumstances, with full engagement of everyone – depending on the position, role and tasks.

Why don't we all do so?

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Economics of agriculture
SI – 2
UDK: 316.334.55:330.341.22 (497.11)

# EVALUATION OF DIFFERENTATION DISTRICTS OF THE REPUBLIC SERBIA IN THE PROCESS OF RURAL DEVELOMPENT

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## Abstract

*This paper analyses some important indicators of rural development, such as: national income per capita, the ratio of maximal and minimal value of national income per capita and the share of the national income from agriculture in the overall national income. The indicators are analysed for 24 districts of the Republic of Serbia and the city of Belgrade, without Kosovo and Metohia. The existing statistical data are used in this analysis as the basis for evaluating the level of development and differentiation of the districts of Serbia. The analysed indicators refer to three time sections, in the following years 1997, 2002 and 2005.*

***Key words:*** *indicators of rural development, districts of Serbia, national income, regional approach, Gini-coefficients*

## Introduction

In the process of creating policies of economic development in the last two decades, considerable attention has been paid to rural development. (Bryden, 2003). Regarding the rural development policies, it is important to have a regional approach, i.e. regional rural policies both in the European Union countries and other countries outside the European Union. (Bryden, 2003). The same author stresses the fact that regional rural development is of great importance for the future of the EU and that it should be differentiated from the traditional agricultural policies. Economic policies in agriculture are just a segment of national policies, which refer to rural economy and the social development. The aim of such policies is not just rural development, but the development of all fields which are manifested within rural frameworks (Bryden, 2003).

In discussions on the aims and prospects of rural development special attention

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is paid to the definition of the notion of rurality. Originally, the notion of rurality came from the duality of the relation between rural-urban areas (village-city) founded on the presumption that the development of rural areas and development of urban areas are diametrically opposite. However, the duality of rural-urban gradually became less prominent, as the relationship between rural and urban areas became more complex, with new types of relations between them arising, which are more complex than the duality of rural-urban (Bryden, 2003).

Regional rural policy of a country should take into consideration a few basic indicators of rural development. The proposals made by the EU countries refer to the following groups of indicators: socio-economic, demographic and territorial-regional indicators (Bryden, 2003). Furthermore, it is very important to define regional units in order to make classifications and evaluations of the level of regional development.

Interactions of relevant factors can be manifested in different ways in certain rural regions, as well as at the level of a country. In most European countries the need for defining statistical indicators of regional units at the national level has been emphasised. It is presumed that different regions of each country are not developed to the same level. It is because of the different levels of development of certain regions within a country why clear defining of regional units is required.

The aim of this paper is to make comparisons among the regions of the Republic of Serbia regarding the development level, based on the values of the selected indicators of rural development. The level of development of certain regions of the Republic of Serbia was measured using a number of indicators. The basic indicator of this research is national income per capita as well as the level of variability of the national income per capita. One of the important indicators of the level of development in regions which was determined was the ratio of the maximal and the minimal values of the national income per capita. In addition, the share of the national income from agriculture in the overall national income was analysed. Besides, Gini - coefficients of concentration) (Čobanović and al.,2006) were calculated on the base of cumulative proportion of the number of inhabitants and the proportion of national income of district ($G_1$), the proportion of the number of inhabitants and the proportion of the district area ($G_2$) and the proportion of the district area and the proportion of national income ($G_3$).

The researched units were the regions of the Republic of Serbia (without Kosovo and Metohia). The researched indicators of the level of regional development refer to the time sections of 1997, 2002 and 2005.

The basic sources were the published data of the Statistical Office of the Republic of Serbia.

## Research results

The analysed districts of Serbia include 161 municipalities and they refer to three regions. The analysis includes 24 districts and the city of Belgrade. The regional division of the Republic of Serbia comprises the division into 3 regions (Bogdanov, 2007).

Ranks of national income per capita in the districts are given in Table 1. The

variability of the national income per capita in most districts of Serbia is high in all the observed years (Table 1). This indicates the fact that variation of production, represented through the greater variation of the national income per capita, was increased in half of the districts in Serbia. This can be a consequence of the unstable results of production, i.e. of the realized social product in the previous period.

The ratio of the maximal and the minimal values of the national income per capita in 15 districts of Serbia increased in 2005 compared with the previous years (1997 and 2002) (Table 1). The increased value of the analysed indicator can be interpreted as a consequence of unstable production conditions and results which worsened during the analysed period of 1997-2005. The increased value of the ratio of the maximal and minimal values of the national income per capita in 2005 was present in the districts where the increased variability of this index had already existed, shown by the coefficient of variation. This phenomenon was determined in the following 12 districts of Serbia: North Bačka, Central

*TABLE 1 - Rank of national income per capita, Coefficient of variation and Ratio of the maximal and minimal national income per capita in the districts of Serbia*

| | Rank NI per capita | | | $C_V$ (%) | | | $NI_{max}/NI_{min}$ | | |
|---|---|---|---|---|---|---|---|---|---|
| Okruzi | 1997 | 2002 | 2005 | 1997 | 2002 | 2005 | 1997 | 2002 | 2005 |
| **Grad Beograd** | 22 | 25 | 24 | 95.39 | 96.41 | 88.62 | 11.50 | 30.10 | 17.06 |
| **Severnobački** | 25 | 20 | 22 | 25.14 | 33.32 | 45.02 | 1.68 | 1.95 | 2.74 |
| **Srednjebanatski** | 18 | 19 | 19 | 11.04 | 12.52 | 19.83 | 1.36 | 1.42 | 1.75 |
| **Severnobanatski** | 20 | 21 | 23 | 21.84 | 23.71 | 26.91 | 1.66 | 2.04 | 2.11 |
| **Juznobanatski** | 24 | 23 | 21 | 30.81 | 43.89 | 41.21 | 2.24 | 2.58 | 4.03 |
| **Zapadnobački** | 23 | 24 | 20 | 30.39 | 61.68 | 18.18 | 1.89 | 2.96 | 1.45 |
| **Juznobački** | 19 | 22 | 25 | 39.03 | 35.85 | 51.78 | 3.09 | 3.45 | 5.21 |
| **Sremski** | 17 | 14 | 14 | 19.67 | 26.84 | 19.12 | 1.71 | 2.09 | 1.57 |
| **Mačvanski** | 8 | 10 | 16 | 24.56 | 19.99 | 48.58 | 2.42 | 1.75 | 3.65 |
| **Kolubarski** | 13 | 13 | 11 | 20.22 | 16.39 | 14.85 | 1.64 | 1.59 | 1.46 |
| **Podunavski** | 11 | 6 | 3 | 14.30 | 8.20 | 31.30 | 1.34 | 1.17 | 1.90 |
| **Braničevski** | 7 | 16 | 15 | 18.86 | 33.27 | 42.42 | 1.76 | 3.22 | 3.28 |
| **Šumadijski** | 2 | 7 | 10 | 36.77 | 22.50 | 13.99 | 4.29 | 2.00 | 1.50 |
| **Pomoravski** | 9 | 15 | 13 | 33.38 | 25.03 | 22.64 | 3.32 | 1.87 | 2.02 |
| **Borski** | 21 | 3 | 2 | 98.01 | 39.53 | 53.41 | 7.85 | 2.41 | 3.86 |
| **Zaječarski** | 12 | 9 | 7 | 19.74 | 15.84 | 9.65 | 1.52 | 1.46 | 1.27 |
| **Zlatiborski** | 6 | 8 | 9 | 43.43 | 42.51 | 53.30 | 3.42 | 3.65 | 5.25 |
| **Moravički** | 16 | 18 | 17 | 27.57 | 7.89 | 24.54 | 1.73 | 1.18 | 1.76 |
| **Raški** | 1 | 1 | 6 | 54.67 | 38.91 | 40.01 | 5.33 | 3.07 | 3.01 |
| **Rasinski** | 15 | 12 | 8 | 41.89 | 19.21 | 21.50 | 3.05 | 1.72 | 1.75 |
| **Nišavski** | 14 | 17 | 18 | 35.37 | 43.82 | 61.33 | 2.61 | 2.63 | 3.87 |
| **Toplički** | 4 | 4 | 4 | 15.93 | 7.52 | 31.63 | 1.43 | 1.17 | 1.97 |
| **Pirotski** | 10 | 11 | 12 | 43.39 | 35.34 | 39.90 | 2.41 | 2.09 | 2.45 |
| **Jablanički** | 3 | 2 | 1 | 26.41 | 27.85 | 40.32 | 1.99 | 2.63 | 3.19 |
| **Pčinjski** | 5 | 5 | 5 | 53.98 | 52.09 | 69.18 | 4.98 | 5.10 | 6.29 |

Banat, North Banat, South Bačka, Mačva, the District of Danube, Braničevo, Zlatibor, Nišava, Toplica, Jablanica and the District of Pčinja.

The average share of national income from agriculture in the overall national income in most districts of Serbia is high in all the analysed years (1997, 2002 and 2005), ranging from 17.2% (in the District of Raška in 2005) to 57.8% (District of Braničevo in 2005) (Tables 2 and 3). The only exception is the city of Belgrade, where this share was significantly lower. It can be noticed that the districts of the Region 1 have a high share of the national income from agriculture in the total national income, ranging from 28% to 56% in the analysed years (Tables 2 and 3). Besides, high share of this indicator is determined also in the districts of the Region 2. These districts are: the Districts of Kolubara, the District of Danube, Braničevo, Šumadija, District of Morava, Nišava, and Toplica districts. The share ranged from 32% to 58% (Table 2). In the most districts of the Region 3 the share of the national income from agriculture in the overall national income is lower compared with the

*TABLE 2: Share of the national income from agriculture in the overall national income in the districts of Central Serbia*

| Administrative District | Years | $\overline{X}$ | Me | $C_V$ | $X_{min}$ | $X_{max}$ |
|---|---|---|---|---|---|---|
| City of Belgrade | 1997 | 18.28 | 6.07 | 117.06 | 0.30 | 56.54 |
| | 2002 | 13.61 | 4.11 | 125.86 | 0.32 | 54.62 |
| | 2005 | 9.83 | 2.83 | 129.03 | 0.23 | 37.27 |
| Mačva | 1997 | 57.17 | 57.31 | 35.13 | 25.98 | 78.27 |
| | 2002 | 55.99 | 64.09 | 40.16 | 26.38 | 78.53 |
| | 2005 | 51.83 | 57.91 | 45.21 | 15.98 | 75.94 |
| Kolubara | 1997 | 50.79 | 51.55 | 37.79 | 23.01 | 77.63 |
| | 2002 | 52.40 | 58.69 | 38.09 | 23.40 | 77.32 |
| | 2005 | 45.98 | 48.25 | 32.56 | 18.66 | 62.32 |
| Danube | 1997 | 39.71 | 42.58 | 35.58 | 24.37 | 52.19 |
| | 2002 | 36.90 | 39.26 | 20.20 | 28.55 | 42.89 |
| | 2005 | 40.59 | 38.18 | 11.43 | 37.65 | 45.94 |
| Braničevo | 1997 | 54.62 | 54.83 | 38.17 | 26.38 | 82.55 |
| | 2002 | 57.75 | 62.61 | 38.48 | 19.49 | 85.42 |
| | 2005 | 57.83 | 57.43 | 40.17 | 16.28 | 82.15 |
| Šumadija | 1997 | 51.16 | 43.91 | 44.62 | 17.19 | 77.37 |
| | 2002 | 50.79 | 56.87 | 46.69 | 15.15 | 73.95 |
| | 2005 | 42.55 | 40.83 | 54.10 | 12.57 | 78.16 |
| Pomoravlje | 1997 | 45.79 | 32.22 | 58.72 | 24.44 | 84.55 |
| | 2002 | 36.08 | 28.40 | 51.11 | 19.55 | 70.45 |
| | 2005 | 31.76 | 22.94 | 64.31 | 18.90 | 72.60 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Bor | 1997 | 29.49 | 7.96 | 141.75 | 2.84 | 77.67 |
| | 2002 | 35.95 | 31.43 | 53.14 | 17.96 | 62.97 |
| | 2005 | 37.13 | 31.33 | 67.62 | 15.43 | 64.63 |
| Zaječar | 1997 | 39.38 | 39.64 | 23.01 | 28.56 | 49.71 |
| | 2002 | 49.19 | 48.15 | 30.93 | 31.84 | 68.64 |
| | 2005 | 48.89 | 47.52 | 30.36 | 32.58 | 67.92 |
| Zlatibor | 1997 | 27.78 | 26.99 | 50.15 | 7.96 | 59.97 |
| | 2002 | 34.08 | 34.09 | 38.68 | 11.37 | 48.91 |
| | 2005 | 30.52 | 25.85 | 55.59 | 9.12 | 68.89 |
| Moravica | 1997 | 25.75 | 20.16 | 47.91 | 18.50 | 44.18 |
| | 2002 | 30.84 | 27.60 | 39.63 | 20.85 | 47.30 |
| | 2005 | 26.13 | 24.36 | 46.40 | 14.56 | 41.22 |
| Raška | 1997 | 21.92 | 19.01 | 54.62 | 14.01 | 42.79 |
| | 2002 | 23.58 | 22.30 | 47.35 | 11.74 | 36.52 |
| | 2005 | 17.21 | 17.59 | 41.40 | 9.99 | 28.50 |
| Rasina | 1997 | 39.42 | 40.97 | 41.69 | 14.86 | 58.33 |
| | 2002 | 42.24 | 42.78 | 38.68 | 20.38 | 64.76 |
| | 2005 | 36.73 | 31.74 | 45.75 | 16.87 | 65.16 |
| Nišava | 1997 | 52.75 | 50.22 | 49.41 | 7.44 | 85.59 |
| | 2002 | 52.13 | 56.10 | 46.61 | 6.95 | 80.70 |
| | 2005 | 47.73 | 52.42 | 55.46 | 3.87 | 84.67 |
| Toplica | 1997 | 52.40 | 51.99 | 49.56 | 23.02 | 82.57 |
| | 2002 | 49.18 | 44.85 | 36.96 | 34.61 | 72.39 |
| | 2005 | 43.26 | 36.02 | 45.50 | 28.79 | 72.21 |
| Pirot | 1997 | 38.02 | 37.01 | 16.04 | 32.02 | 46.03 |
| | 2002 | 41.40 | 36.54 | 38.08 | 28.40 | 64.09 |
| | 2005 | 29.75 | 27.34 | 38.98 | 18.40 | 45.94 |
| Jablanica | 1997 | 38.94 | 35.83 | 55.97 | 12.98 | 73.70 |
| | 2002 | 52.07 | 55.30 | 41.96 | 26.59 | 77.14 |
| | 2005 | 51.43 | 52.02 | 52.17 | 19.83 | 83.07 |
| Pčinja | 1997 | 22.94 | 22.12 | 48.96 | 8.63 | 39.66 |
| | 2002 | 31.30 | 26.88 | 52.29 | 13.33 | 61.54 |
| | 2005 | 31.01 | 31.81 | 47.29 | 10.67 | 49.88 |

previously named regions, ranging from 17.2% (in the District of Raška, in 2005) to 42.2% (in the District of Rasina, in 2002) (Table 2). The only exception was the District of Jablanica of the Region 3, but it had a high share of national income from agriculture in the overall national income in all the analysed years.

*TABLE 3: Share of the national income from agriculture in the overall national income in the districts of Voivodina*

| Administrative Districts | Years | $\overline{X}$ | Me | $C_V$ | $X_{min}$ | $X_{max}$ |
|---|---|---|---|---|---|---|
| North Bačka | 1997 | 34.64 | 41.87 | 39.21 | 18.97 | 43.07 |
| | 2002 | 38.56 | 41.25 | 55.70 | 15.87 | 58.57 |
| | 2005 | 41.26 | 46.54 | 51.50 | 17.86 | 59.37 |
| Central Banat | 1997 | 55.64 | 68.74 | 41.48 | 20.82 | 74.04 |
| | 2002 | 45.10 | 52.50 | 45.31 | 17.71 | 66.45 |
| | 2005 | 47.49 | 53.81 | 36.76 | 17.20 | 61.75 |
| North Banat | 1997 | 36.91 | 38.90 | 25.23 | 22.81 | 47.62 |
| | 2002 | 30.96 | 30.96 | 39.09 | 19.05 | 52.11 |
| | 2005 | 35.56 | 35.46 | 36.47 | 18.50 | 54.80 |
| South Banat | 1997 | 49.85 | 53.96 | 46.55 | 14.37 | 79.10 |
| | 2002 | 47.52 | 53.23 | 44.29 | 13.22 | 69.44 |
| | 2005 | 45.40 | 51.37 | 43.84 | 13.99 | 68.33 |
| West Bačka | 1997 | 28.64 | 29.73 | 36.45 | 15.54 | 39.54 |
| | 2002 | 27.99 | 31.34 | 52.20 | 7.87 | 41.42 |
| | 2005 | 28.86 | 29.26 | 30.87 | 18.07 | 38.88 |
| South Bačka | 1997 | 40.32 | 38.43 | 46.45 | 14.10 | 65.72 |
| | 2002 | 37.34 | 36.97 | 53.23 | 9.71 | 72.48 |
| | 2005 | 34.30 | 28.95 | 64.89 | 4.87 | 77.51 |
| Srem | 1997 | 50.11 | 40.11 | 40.07 | 32.43 | 81.27 |
| | 2002 | 48.20 | 46.36 | 38.64 | 24.13 | 74.92 |
| | 2005 | 44.43 | 38.05 | 45.00 | 22.43 | 82.37 |

In the majority of districts the share of the national income from agriculture in the overall national income in 2005 is lower compared with the previous time intervals. The exceptions are the Districts of North Bačka, West Bačka, the District of Danube, Braničevo, Bor and Zaječar, where the values of the analysed indicator in 2005 raised compared with the 2002 and 1997. Such raise of the share of the analysed index can be noticed in 4 districts of the Regions 1 and 2, and in 2 districts of the Region 3. Lowering of the share of the national income from agriculture in the overall national income is expected, being in accordance with the lowering of the share of the domestic product of agriculture in the overall social product. Namely, in agricultural theory there is a pattern that the increase of economical development of a country leads to the relatively lower importance of agriculture because a high share of agriculture in the gross domestic product of economy is the indicator of its economical underdevelopment (Čobanović et al., 2005). Therefore, a high share of national income from agriculture in the overall national income could be an indicator of insufficient economic development of a district, i.e. of a region in Serbia.

These results, which illustrate a high share of the national income from agriculture in the overall national income, confirm the already existing data that

practically in all regions of Serbia there are favourable conditions for development of various branches of agricultural production. Thus, it has been stated that favourable natural and climatic conditions of Serbia promote development of different branches of agriculture (Bogdanov, 2007).

The calculated values of Gini-coefficients (Table 4) show the increase inequality of distribution of national income ($G_1$), population density ($G_2$) and territorial density of national income ($G_3$) in analyzed districts. The results confirm previous conclusions (Heijman, W., Mangnus, E., 2008) that in the transition process towards market economy regional desparities increase.

*TABLE 4: Gini coefficients*

| Gini-coefficient | 1997 | 2002 | 2005 | 1997-2002 | 2002-2005 |
|---|---|---|---|---|---|
| $G_1$ : National income (NI) disparity | 0.08601 | 0.13536 | 0.21206 | 57.4% | 56.7% |
| $G_2$: Population density disparity | 0.28079 | 0.30765 | 0.31487 | 9.6% | 2.3% |
| $G_3$: Territorial density of NI disparity | 0.11523 | 0.12132 | 0.14492 | 5.3% | 19.5% |

## Acknowledgements

The paper has been supported by the Ministry of Science and Environmental Protection of the Republic of Serbia (Project no. 149007).

## Conclusion

This paper analyses national income per capita and the share of the national income from agriculture in the overall national income for regions of the Republic of Serbia for 3 time sections covering the period 1997-2005. The variability of national income per capita is high in most districts, which can be interpreted as an indicator of unfavourable production conditions at the level of the Republic of Serbia. The high values of the ratio of the maximal and minimal values of national income per capita in most districts are also an indicator of unstable production conditions during the analysed period of time. The share of the national income from agriculture in the overall national income in most districts of the Region 1 (lowland regions) and of the Region 2 (hilly regions) is high and it ranges from 28% to 58%. In most districts of the Region 3 (mountainous and hilly regions) the share of the national income from agriculture is significantly lower, ranging from 17% to 42%. There is a similarity of the obtained results of the analysed indicators at the level of the Region 1 and Region 2. The values of Gini -coefficients show that in the transitional process in the analyzed time period the regional differences were increased.

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Economics of agriculture
SI – 2
UDK: 631.153

# STRATEGIC PLANNING ON THE LOCAL LEVEL AS A FACTOR OF MORE EFFICIENT RURAL DEVELOPMENT

*Njegovan Zoran, Pejanović Radovan, Katarina Marković*[1]

## Abstract

*The primary objective of the paper is focused on how to reverse the process of continued impoverishment of the local rural areas and create conditions for social, cultural, economic and environmentally sustainable development based on local initiative. In order to meet this objective, an attempt is made to define systematic, continuous and cyclic approach of setting up priorities and policies as a basic tool for strategic action planning on a local level (LSAP). Decentralization of the state, strengthening of local municipalities and participation of citizens is the process that has to be articulated toward efficient development.The paper can provisionally be divided into two parts. The first part encompasses the importance of local strategic planning while the second part gives the bases for the formulation of the strategic action planning methodology. Local development must be based on adequate decision making process and process of implementation. Those characteristics are bringing certainty in the structure of the LSAP development.*
***Key words***: *Rural Development, Strategic Planning, Local Level, Sustainability*

## The concept of strategic planning

The explication of this topic should begin with the question: What has happened meanwhile with the planning function in Serbia and in the international surrounding, especially in developed market economies? As an answer to this question it is necessary to underline the importance of planning in the light of continual discussions on redefinition

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of the development concept, existence of a wide range of potential developing areas[2], and finally, its importance in the presence of manifold functions of the state. In addition, it is necessary to depict the level of interrelatedness and complementarity, which is realised in a triangular relation of the *market – planning – economic politics*, while the structure of economy and society, i.e. institutional organisation, undoubtedly represents a special aspect.

In the Republic of Serbia planning has for decades been not only an important part of the system, but perhaps the most prominent determining element and strength of economic, political and ideological practice. It conditioned the character and modalities of the society under development. The effects of such planning system were obvious and in relation to the planning process itself whenever recently mentioned it evokes associations that relate planning to the roots of the so called "eastern sin".

The necessity of building a new approach is inevitable and it has to be harmonised with the fundamental identity of the society, i.e. with the future orientation of the country, while being simultaneous with related achievements accomplished in countries with developed market economies.

Monitoring of the latest international experiences in the field of regional development and planning lead us to a conclusion that inherent indicative planning from long ago has gradually transformed itself into something known as local strategic structural planning. This kind of planning, being the integral part of the so-called "Glocal"[3] approach to regional development and development in general, is very present in mixed economies and integrating countries. In course of time, these groupings have had to orient themselves towards planning as an important element for the market labelled as "organised market" or "human-oriented market". Such a concept has developed as an answer to the question of the establishment of competitiveness, thus a long-term dynamical economic balance.

Perhaps this is a good place to mention also theoretical approaches such as the *theory of anomie*[4] which states that development leads towards destabilisation and decentralisation of social consciousness and system structure through differentiation and progression of labour division. In other words, the impact of the existing social consciousness and social norms in a certain point of time becomes an increasing limitation their effects start gradually decreasing so that they become less binding – which all results in the advance of anomie. This gives rise to public confrontations, fresh ideas and new movements, organisations, strikes, etc. which can by no means be

2 The most important developing areas are the following: international exchange, industrialisation process, technological development and dissemination, economic sectors, relation between nationalisation and transnationalisation of development, regional development, local development, rural development, environmental development, sustainable development, cultural development, development of human rights, etc.

3 This approach is generally known as hybrid model – a combination of Global and Local approaches to developing tendencies

4 Durkheim's theory recently redeveloped by Neil Smelser

brought under the old moulds. If this takes place when there is an economic crisis, as is the case in Serbia, we face what Durkheim calls de-qualification. This process pushes down many individuals and families to a lower level of material status in accordance with which they should tailor their behaviour – self-control, ethics and the way of life. In such a situation the advantages of social impact die out, so the society would have to promote more rigorous forms of ethical behaviour accompanied with attributes such as self-control and solidarity that are compatible with this phenomenon. Of course, this kind of behaviour cannot be attained so soon, and there are efforts to escape the existing hard conditions, which is often done in an inadmissible way. This leads to a weak (if any) integration, tensions and conflicts, which characterise the emerged social changes – namely, a tendency towards involution and regression to the old situation. \

This practice often leads to a gradual establishment of fundamental functions and structural processes that make social advancement. One of the starting processes is the differentiation[5] process, which as a rule begins with specialisation caused by disintegration and decentralisation. Thus the old set-ups are abandoned and the surrounding for new ideas and new mutual relations is created. Differentiation enables creation of new production/service centres, new cultural centres, as well as new political centres among which there are both competitive and cooperative relations. This normally refers to a smaller number of totally possible units (leaders), while other time-lag units are followers on the same track. Differentiation as such does not only make space for decentralisation, but also for democratisation of society as a whole. As a functional process on which development is based, it is also called *inclusion*, and it includes a growing part of strata in particular decision-making levels. Thereby adaptation to new situations and new events and enhancement of adaptation capacities are underlined as basic values in the neo-evolutional theory. It is generally achieved through competence, specialisation, professionalism and technological advancement.

Taking into account what has been said so far, as well as the character of this paper, it is necessary to highlight the subject of development and development goal as first value elements. Development has to do with the development subject in the first place, which puts in the foreground the question of the subject's own perception. This practically means the following: »I measure what it was like to me« and in what way what I have relate to what I expect, hope for and want. On the other hand, development goal is not mere daydreaming about what I might have, but is essentially related to own capacity and adopted and shaped capabilities to join the development process properly. This brings us to a dilemma how to lay out possible development courses, while avoiding »blindness of excessive closeness«, how to settle the issues like non-existence of social consensus over the role of the state, technological development, etc. but also how to create premises for a true perception of one's own reality.

5 The most important differentiation area being isolation of an individual as a citizen with fundamental rights (the right to civil freedom – freedom of consciousness, opinion, speech, freedom of ownership, freedom of political self-organisation, and the like)

## The basic aspect of strategic planning

In its essence, strategic planning rests upon the aspiration and need to make some changes at the local level so as to ensure growth and development in the middle and long run through qualitative and quantitative approaches, to enable evolution and succession, instead of revolution and restart of initial development processes, over long time periods which will cover a range of generations – diagram 1.

Therefore strategic planning entails, as does any other planning practice, two basic preconditions:

a) Adequate institutional grounds that will establish mutual relations among all agents – stakeholders within a community/joint arena, and

b) Corresponding professional know-how to make sure that local participants at different levels do contribute to the creation of efficient action programmes (where failures are eliminated beforehand, mistakes avoided in advance, etc.).

Institutional arrangements, as do applied professional practices, are activated in accordance with the need to eliminate internal frictions and external tensions, wherefore strategic planning gets attributes that are most often expressed as: knowledge-based, intention-guided, law-based and reason-controlled process. Strategic planning as such is based on reliability of findings, possible perspectives and competent estimations, which, as approach, can be expressed with epistemic and pragmatic knowledge.

## The elements of strategic planning

Local strategic action planning has to be methodologically well-grounded so as to be able to answer the following important questions:

Successful and efficient development of local communities is not possible in the absence of an overall process of strategic management including planning, implementation and evaluation of accomplished effects. This is of equal importance for municipalities with abundant funds as for those with insufficient funds. Whatever the case, the optimal funds allocation has to be based on development priorities of the municipality as defined in the strategic planning process. Municipalities that go through strategic planning are as a rule more successful, customer-related, demonstrating increasing responsibility for the needs of the local community. At the same time strategic planning is a highly transparent process which makes sure that all relevant subjects participate in planning the future of the local community.

The following is one of the adopted and widely used definitions in projects: "Strategic planning is a systematic process through which the local self-government, jointly with local business subjects and citizens, identify pressing issues and set tangible objectives, tasks and strategies in order to tackle the issues. Strategic planning can be, for instance, applied when planning the economic development or capital investment."

The strategic planning is not an ad hoc activity, rather a systematic, continual and cyclic process. This means that it has to be carried out in regular intervals, thus

becoming a routine activity in the operation of the local self-government (covering the period of three-four years). It could be considered as a complex process that includes all relevant subjects of the local community: Finally it is a mean of administration for the purpose of meeting the current needs and solving the existing problems of the local self-government. As such it can be applied in deciding on capital investments, public services and future economic development.

Its implementation it is important adequate surrounding – political, legal and economic, with special emphasis on sufficiently of a wide and clear authoritisation over local resources for successful strategic planning at the local level; understanding of the framework within which strategic planning should be carried out, especially readiness to accept or realise the necessary changes in the local setting for the purpose of correct realisation of the process; compliance in defining the objectives – the final objective and the most important parts of the process have to be completely clear to all participants and presented to the public; and readiness of officials/decision-makers for cooperation and team work in the local self-government and the community in general.

Understanding of the strategic planning process management is of a great importance, especially by those who manage the process: Local staff and lecturers who know how to conduct strategic planning and possess the know-how of the matter: planning of capital development, i.e. of economic development and budgeting; than access to information necessary for the strategic planning process – people who work on the realisation of the process are the ones who present the information; as well as identification of the need for external assistance

## The method of stratetig planning at the local level

The elected municipal management staff, with the assistance of the appointed staff, should develop the strategic planning process and define what will become a part of strategic planning and what will not. Considering this, the following has to be taken care of:

- The process should be adjusted to local conditions and special attention paid to the fact that there is poor knowledge about the concept of strategic planning; the terminology related to strategic planning should also be clarified.
- The process should be structured in such a way that expected results are realistic and feasible, which means that the realisation of objectives, tasks and results has to be within the financial capacities of the Municipality

Paralel it has to be created the reliance and understanding of all participants, including the community as a whole, can be achieved only if strategic planning contributes to the realisation of immediate and visible results.

The Process should be realised in phases, meaning that all phases are included in planned activities, namely:

- Development of mission and vision
- Definition of objectives and tasks
- Training and presentation of the process (if necessary)
- Provision of appropriate (neutral, accepted by all team members) premises for the work of the strategic planning team
- Collection of information, including the analysis of project advantages, weaknesses, possibilities and challenges, as well as the estimation of available funds (internal and external)
- Identification of available alternatives
- Definition of priorities and decision-making process with public participation
- Regular informing the public on the results and implementation phases.

It is essential to make that process sustainable and avoid situations where strategic planning starts being a theoretical exercise with no reference to the real life, or just a "single-shot attempt" which is not going to be realised in the future.

## The structure of strategic planning at the local level

The strategic planning model, as described here, can be considered applicable in Serbia because it represents one of many successfully standardised models that have been developed and implemented in the cities and municipalities of the Western Europe. A representative model contains several components that have to be considered when formulating the strategic planning process in the local self-government, with special emphasis on the following:

- *Analysis of the Environment* – Each process planning, especially if it is a strategic planning process, has to be based on an objective estimation of the environment conditions within the community. This includes the assessment of external and internal factors. External environment can be such that the local self-government is not in a position to change certain conditions which are prescribed by the higher-level authorities. However, the local authorities can and have to be ready to affect the local conditions having a bad impact on the process.
- *Formulation of the Vision and values* – in the nature of the assessment of the local community's working environment, it is of vital importance to develop a system of local values and a vision which are reasonable for the majority of representatives of the local authorities and wider community, i.e. citizens and economic agents. The vision of a community represents a wider perspective for the future and should serve as a guideline for all participants in the strategic planning process. Its role is also to ensure that all participants in the process, even when they do not act identically, stay on the same track during the process. Values are common knowledge, opinions and attitudes of all participants which are related to the purpose, internal (organisational) culture and general behaviour in an organisation and the society. Both the community's vision and its values are usually long-term

and change only over a long time intervals. The main role of values is to ensure that the community's vision and its future are not disturbed by future political or non-political changes.

- *Formulation of a Mission and leadership* – In so far as the vision of the community reflects a wider perspective, the mission of the community is a clearly defined wide system of objectives which serves to explain this wider picture in a more detailed way. It is typically a short description of the future of the Municipality (with or without an explanation). Mission can be essentially defined as a standalone, widest objective of the community.
- *Setting up of objectives* – Objectives are management tools aiming at precise explanation of the ways for best materialisation of both vision and mission. While mission gives a wider course and meaning, multiple objectives are there to make a concrete orientation in the everyday work of municipal authorities and of other agents involved in the process. Such objectives are often defined during the budget development process in order to achieve the defined vision and mission of the community considering the available resources.
- *Creation of the Strategy, structure, and systems* – as a "tools" by means of which vision, mission and objectives are realised. *Strategy* refers to the general action plan aiming at the achievement of certain objectives. It defines activities (fields of operation) that the community sets to develop, capacities, abilities and knowledge that are necessary for the realisation of these activities and, of course, the tendencies and courses required for the growth/progress of the municipality. *Structure* refers to the way the organisational structure of the municipal authorities is established in order to realise vision and mission. Finally, *systems* refer to management tools by means of which strategy is accomplished within the defined structure. Systems, such as annual budget (management tool, in the first place) are developed in order to distribute resources and responsibilities for public spending during the realisation of the community's vision and mission.
- *Implementation of the SAP* – In this phase all process components are activated. Depending on the quality of work in earlier phases, implementation should be efficient (lowest expenses) and effective (with as good results as possible). This ought to result in high level services, increased performance and excellent financial results.
- *Monitoring and Evaluation* – Self-evaluation is the final phase in the strategic planning process. Therewith a completely new process is started to be carried out in the following year. It serves to compare the strategic plan with the performance of local authorities. Here levels of success, possible set-backs and difficulties are identified as well. In line with the evaluation results, corrective measures are proposed aiming at improvement of the overall performance of strategic planning for the next year.

## Concludin remarks

The Republic of Serbia has recently passed the Law on Local Self-Government and other Laws that are giving a larger autonomy to local authorities and exacts organisational restructuring of the whole system of local authorities in Serbia. Together with efficient institutions they are efficient tool for the development on a local level. So it could be stated that strategi planning at the local level is of enormous importance for its development. If so supported, strategic planning process can be a backbone of the local reform, thus opening the door to new possibilities.

Therefore the above described model illustrates how the local authorities can restructure/reformulate their practices and procedures so as to make a positive impact on a far-reaching future of local communities in Serbia. Efficient restructuring of the local level based on NUTS regulations, implementation of strategic planning and development of a long-term strategic management plan based on the local community's vision and mission should be conducted simultaneously despite the fact that each of them will have varied success. However, the advantages originating from the realisation of such a concept and related to the reform of local authorities should result in tangible and measurable indicators with direct impact on a policy and everyday life of the citizens of Serbia and their aspiration to achieve a high standard of living.

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Economics of agriculture
SI – 2
UDK: 334.73:338.124.4

# DEVELOPING RURAL SMALL BUSINESS – AN OPORTUNITY FOR MITIGATING THE FINANCIAL AND ECONOMIC CRISIS

*Zoltan Panczel*[1]

## Abstract

*This paper wish to show the importance of small rural business in rural comunities, as a way to develop benefit rural economies.*

*With educational programs, assistance and expertise of Romanian and foreign foundations, some communities with entrepreneurial courage to deal with consumers in major urban markets and even Europe.*

*The purpose of this study is to show that there are posibilities to develop rural small business with own financial sources or by the aid of European founds.*
***Key words**: rural community, small business, European founds*

Does small business development benefit rural economies more than recruitment of outside investment? In the ongoing debate about the relative merits of these two approaches to economic development, critics make the following case against the recruitment strategy.

David Birch's evidence that small firms contributed 80 percent of new jobs to the economy between 1969 and 1976 is cited, suggesting that the probability of success in job generation is high with the small business strategy. In addition, agglomerations of small, innovative firms have been acclaimed for contributing to the resilience of local economies and for enhancing the skill levels of an area work force. By the late 1980s, this perspective had become orthodoxy in the field of economic development. However, evidence began to emerge which called into question the conventional wisdom that small firms are the key to economic growth. Research demonstrated that the share of jobs in small firms was not increasing, but remaining quite stable.Though job growth rates are higher on average in small firms than in large ones, most small firms don't grow at all, and large start-ups account for the lion's share of new firm employment increases.

Recent studies have challenged not only the job-generating power of small businesses, but also the benefits of small-firm job creation. Case study research of

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industrial districts suggests that small, locally owned firms in many areas depend on contracts from large corporations and provide low-wage, unstable employment. Evidence from microdata clearly indicates that small firms pay lower wages and offer fewer fringe benefits than large businesses to workers with similar qualifications. Vulnerability of the local economy due to dependency on large or externally owned businesses is a particularly salient issue for rural communities. Nonmetropolitan areas have a disproportionate share of manufacturing industries with routine operations and few managerial and professional jobs.

These rural industries are more vulnerable than others to cyclical variations in employment, and within industries rural branches are the first to be cut in recession. During the 1980s, branches of large externally owned retail firms began restructuring the residentiary services sector in rural communities, as well. Encouraging entrepreneurship and small business development has been a major theme in professional discourse of rural development practitioners and academics. Community factors related to business creation have been examined and policies and programs for assisting small, locally owned businesses proposed and initiated.

Yet rural communities continue to pursue external investment, and recent research suggests that this approach may compare favorably with the entrepreneurial strategy.

About small business we can tell that, at the begining, Carolina was a welcoming host for small traders, artisans, talented, farmers open to progress, in general, "all those willing to take risks necessary to start a business and take fate into their own hands. In our times is still a tradition of entrepreneurship and small businesses that people from the village and North Carolina can be proud. " These words open a local history of rural entrepreneurship conducted by the Institute for Rural Entrepreneurship Rural Economic Development Center of North Carolina. However, we are told, on several occasions threatened this traditional 20th century entrepreneurship in rural areas, and imposing changes.

First, large corporations have come in the first decades, to dominate the local industries.

Then came mid-century industrialization and new technologies of the '80s, which led to factory closures and layoffs. They were added, finally, leaving young people, especially the educated, the urban areas where they could find better paying jobs.

In the '90s, globalization and pressure products made with cheap labor from developing countries led to the closure of many businesses and the loss of countless jobs, just excelled in areas where local entrepreneurs. Thus, "local businesses that have managed to identify new markets, create products with a new type of added value and adapt to change quickly prospered and developed. Many farmers and entrepreneurs have benefited from expansion into new markets. "

In a context quite different, but with the same strong tradition of Romanian villages small producers face after '89, the same challenges: lack of access to markets dominated by large retail chains, the exodus of young people abroad or by cities compete

with products produced on an industrial scale and low quality products imported from elsewhere. Therefore, solutions can only be the same. Some of the proposed Institute of North Carolina Rural Entrepreneurship: entrepreneurship education programs and courses tailored to specific communities, access to microcredit, business advisory services, promoting local entrepreneurial culture and the integration of national and international markets.

Slow Food Movement in Romania is one of several projects for many years, trying to meet these needs.

With educational programs, assistance and expertise of Romanian and foreign foundations, some communities with entrepreneurial courage to deal with consumers in major urban markets and even Europe. Unknown villages, hundreds of small farmers and craftsmen, from breeders and beekeepers to potters, wood carvers and blacksmiths, have restored the chance to Romanian tradition of entrepreneurship, providing a global market all our best, remains endangered cultures.

Creating and developing a mechanism for best practices, consistent and uniform, the business representative organizations in Romania, to support rural entrepreneurship development, a mechanism that will allow these organizations involved directly in supporting sustainable development of rural entrepreneurship and boost development of non-agricultural activities through the sustainable development of human resources.

Specific Objectives: - analyze the current status, needs and potential business development in rural areas at the eight counties in three development regions, with different rural type - development mechanism to support rural entrepreneurship through: creation of advisory centers Rural addressing the level of representation, advice and assistance in opening / business development, sign up individual profiles Job and exchange of non-agricultural, building partnerships with organizations representing the business environment in Romania to facilitate the exchange and integration of best practices for the benefit of rural entrepreneurship development - developing and implementing training programs suitable courses and seminars to improve quality and sustainable development of human resources and rural entrepreneurship - running a campaign to promote entrepreneurial culture, including publishing a magazine dedicated to the distribution in rural areas, radio and television broadcast stations with regional coverage and reception rural areas to promote non-agricultural activities (crafts, traditional handicrafts, tourism and other non-agricultural activities) by organizing and facilitating access to exhibitions, conferences and workshops, and creating guidelines to initiate and develop a non-agricultural business in rural areas.

After making some experiments opening small business with the aid of European financial resources we concluded that the flexible specialization model of networks of technologically advanced small firms holds little promise for rural areas, though small and mid-sized rural businesses may compete successfully in niche markets of mature, generally low technology industries.

We present some of the activities that could be developed in rural regions:

- investments in non-farm productive activities concerning light industry, for

example articles of leather, footwear, wool, fur, knitwear, household items;

- investment in wood products processing industry - from state timber (eg furniture), precision, assembly machines, production tools and home appliances, packaging or other such investments;
- investment for development activities craft, handicraft and other non-traditional agricultural activities-specific processing are considering iron or wool, pottery, embroidery, and making traditional musical instruments;
- small shops of their products from those activities.

Regarding the creation and diversification of services for rural populations are among eligible, for european projects, investments for tailoring services, barbers, shoemakers, but also providing Internet connection and dissemination of mechanization, transportation - other than buying vehicles. Are also eligible investments in plant protection and animal artificial insemination in car repair services, tools and household items.

Moreover, attracting a significant new manufacturing plant may not be an impossible dream, but a relatively common event, for some rural communities. In comparing strategies for economic development, policy makers must go beyond the focus on job creation by large and small businesses to assess the long-term impacts of recruitment and entrepreneurial strategies on the economic and social well-being of the community as a whole. Little empirical work is available that explicitly addresses broader community impacts of large and small business job creation in rural areas. Among the few relevant studies are surveys of rural household and firms in Romania compared aspects of job quality.

Thus higher employees wages of large businesses may not translate into higher income and employment overall for counties where large firms predominate. Another study analyzed the association of "entrepreneurial content" with measures of employment and income growth.

Results indicated that small businesses contribute to the economic health of nonmetropolitan counties, but the study was not designed to compare the impact of large and small business creation.

The purpose of this study is to show that there are posibilities to develop rural small business with own financial sources or by the aid of European founds.

While most research has focused on the probability of success in creating or attracting businesses and jobs, and geographic characteristics that determine such success, this analysis addresses the consequences of small and large business development for county economies.

This study concludes that the vitality of small business development has a stronger positive impact on rural county employment, tax base, and sales than success in attracting establishments owned by large enterprises.

After analysing some of the conditions to develope small rural business we established development strategy variables on economic performance measures.

The number of small start-ups and the total number of small businesses in operation measure the small business or entrepreneurial vitality in each county. The

number of large businesses locating in each county indicates the level of recruitment success.

A small business is defined as an establishment of an enterprise employing fewer than 100 workers. The numbers of new and operating businesses refer to business establishments, or distinct business locations.

However, the size of the business is determined by the number employed at all locations throughout Romania by the company or enterprise that owns the business. An establishment of a large firm that is new to a county may employ few or many workers locally, and it may be of any industrial sector.

Growth in total employment is a key outcome measure, since job creation is the fundamental goal of most economic development efforts.

Earlier research indicates that small businesses are more closely linked to the local economy than subsidiaries of large enterprises. Thus, small business starts are expected to affect total employment more than new large firms. Evidence also suggests that the rate of job growth is higher in small firms. Thus, when total firm population is held constant, the number of small firms is expected to be positively related to total employment growth.

The trend in the value of a county's tax base, hence its ability to finance education and other public services and facilities, is another indicator of economic performance.

The tax digest is a reasonable, but imperfect, measure of the value of real and personal property.

New businesses are expected to have a positive influence on sales, though displacement of existing sales and the proportion of firms not involved in taxable sales activity will reduce the effect.

Development encompasses not only expanding employment opportunities, but also wage levels. Both large and small business start-ups are expected to contribute to wage growth as the labor market tightens due to increased demand for labor.

Since previous research indicates that wage levels tend to be higher in larger firms, new large firms are expected to affect wage growth more strongly than small businesses.

The stability of local employment is another important aspect of labor market performance. Small business development is expected to increase employment stability, since economic dislocation stimulates entrepreneurship. Large businesses, on the other hand, are expected to decrease stability as openings and closings generate swings in demand for labor.

In summary, evidence from rural Romanias counties leads to three conclusions. First, small business development is strongly correlated with growth in employment and property tax base, but success in recruiting establishments affiliated with large enterprises is not significantly associated with these important economic development goals.

Management assistance aids individuals who may be highly knowledgeable in their specific fields, but who lack general management skills in such areas as accounting, strategic planning, personnel management and marketing. Venture capital programs match investors with entrepreneurs, and revolving loan funds help small funds leverage the debt financing they need. Business incubators provide affordable space and shared

support services for fledgling firms. Trade associations and community-based business organizations offer entrepreneurs opportunities for networking, mentoring, and lobbying for favorable public policies.

The strategic objective of the National Policy for Rural Development about „improvement of the competence of the farmers and personnel working in the agriculture, food processing and forestry sectors that allows a better management of the agricultural and forest exploitations" and the sources from European funds for this axis are towards the quality improvement of the rural workforce.

The profound restructuring already happening in agriculture after 1989 or ongoing and amplified after 2007, the year when Romania joined the EU, are premises of substantial reform in the education and research, extension and consultancy, both in agriculture and rural economy in general.

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Economics of agriculture
SI – 2
UDK: 636.4:637.07

# TRACEABILITY OF PORK - ADVANTAGES, BENEFITS, MONITORING

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## Abstract

*Globalization of trade expands distribution of products and services worldwide, making it more difficult to control the content and quality. To prevent "food terrorism it is necessary to know the evolution of animals from birth to end of life. As long as an animal remains in the same group is easily identified by group ID. But once it leaves the farm, things become more complicated and traceability implementation must take into account many factors. For analysis, the firm needs information about vaccination, food, medication and supervision.*

*To prevent consumer illness it is very important to monitor (track) the products chain. If a contaminated batch of food is found it will be easier to identify where they were distributed, and what point in the chain of traceability has been contaminated. Monitoring traceability is a complex process, if we consider the steps taken to obtain meat, and therefore, involves the use of a computer system; making it the classic way is difficult and expensive.*

***Keywords:*** *pork, food safety, traceability, quality*

## Introduction

The first international definition of traceability was given in ISO 8402, 1987, as "*the ability to retrieve the history, use or location of an entity by recorded identifications*", an entity may designate: a task, process, product, body or a person.

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Other definitions regarding traceability:

| | |
|---|---|
| ISO 8402:1994 | possibility of tracing the history, application or location of an entity through information recorded |
| UE Regulation – Agor food products law 8/5/01 | ability to trace and track food, or substances producing animals in all stages of production and distribution |
| ISO 9000:2000 | ability to pursue development or location of what must be considered (European Commission, 2004) |
| General Law of agro-food products nr. 178/2002 (taken in law no. 150/2004) | ability to supervise and control the evolution of a product: the place of origin, date of manufacture, processing, or applied to a type of product quality<br>Ascultați<br>Citiți fonetic |

## Material and methods

Traceability is necessary especially in the agro-food products for human consumption but can be applied in any field of economics (eg provenance of a work of art or a car if they are implemented for the tracking system). Traceability is pursuing a product and processing information related to it at each stage of the production chain. As the supply chain process, traceability can be conducted in two different directions: *forward* or tracking *downward* traceability (the ability to locate a product based on specific criteria, at any point it could find on the chain), monitoring *backward* or *upward* traceability (ability to identify the origin and characteristics of a product based on criteria established in a uniform manner for all intents and supply chain).

Requirements of individual areas of the food industry and food areas are very different, yet they share the full certification path that it travels a raw material from supplier, through the various stages of production and trade up to the final consumer. Traceability is an indicator of the power supply company in the market. Thus, the company builds and reinforces consumer confidence in their products, since both have total control over its production traceability and on the market, it can occur at any time withdraw from the market entirely or to a certain point selling the product for one reason or another has proved inadequate or does not meet current legislation.

## Results and discussion

*The importance of traceability* is in its objectives, namely:
- Production of safe food (healthy) human consumption;
- Animal health protection against the spread of diseases (they are much easier to detect outbreaks of infection);
- Management of emerging diseases.

Traceability helps authorities to eliminate the risks that animal diseases or contaminated foods posed to food safety or food supply. It also guarantees the origin of

animals or certain breeds that are regional specialties. It ensures a transparent traceability for food and animal feed. To maintain consumer confidence, the identification and control is essential for all livestock farmers. An effective traceability system, using the common language of computing, can provide pork trade in Europe and even global markets.

In traceability is applying the principle "*one step forward, one step back*." So, any element of the production chain is required to hold toward all necessary information about product origins, namely the origin of raw and auxiliary materials to hold information relating towards the next item delivery date and destination. To achieve this all you need to find ongoing series (product, location, manufacturer, carrier, vendor, etc.).

The most important principles of traceability are:

• *identify the individual*. Each stage of the route of a product (production, transport, supply, storage, sale) is assigned an identifier (key or link to data). Sole contains useful information about the product or the entire batch;

• *Reception and transmission of data*. How to record and data transmission can be chosen depending on the degree of accuracy and speed of transmission, which are suitable for product coding. This principle is the unit of measurement traceability;

• *data reporting*. Once the product reached the market is required as identification of data to be available to be able, if need be rebuilt production chain. Data transfer must be made in a form of "dialogue" which provides decoding of information retrieved by the recipient;

• *connection information*. If the power transmission of data is lost and the steps which ultimately results in traceability. On resuming data communication connection is restored.

## The advantages and benefits of traceability

Feeding is the essential condition for human existence. The progress of human society is reflected in the production of food. Agriculture and, in general, fruit and food have become the recourse to scientific evidence in their practice. The higher degree of civilization, man is increasingly interested in the manner in which to obtain food, nutritional content and quality and their origin, what has been built to produce them in agriculture and / or food and they an important role for the state of his health, which allow efficient expression in economic activities, scientific, cultural.

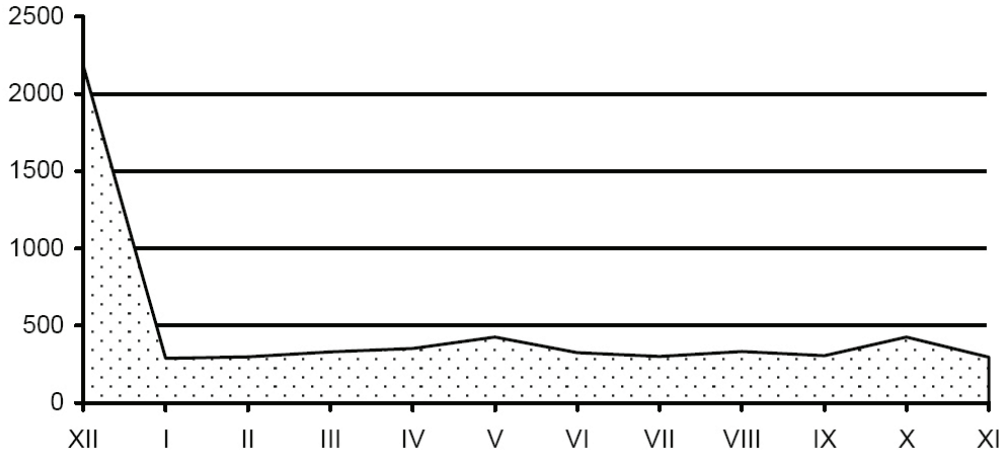
Concerns, relatively new, producers and consumers, aimed at ensuring food quality and thus the food security of the population, was directed towards actions to enable the traceability of food products knowledge, it has a number of advantages for companies producing and for consumers.

Meat is an important source of high biological value protein, fats (the pork approx. 30%), glycogen, minerals and vitamins (composition is appropriate to their age and nutritional status of the animal), it is therefore a food base. For these reasons, meat from different animal species, is preferred by all mankind, intervening consumption

habits, including sometimes religious nature.

Statistics show that on average, a Rperson from Romania consums 60 kg of meat per year, compared to 90 kg is how the EU average. Here, half of consumption, ie 30 kg of pork is represented (*Figure 1)* by tradition, the pig slaughter weight is recorded in December. For this range, if we compare it to other states of the Community, it appears that we are below the European average.

*Figure 1 – Number of slaughtered pigs in one year, in Romania, thousands of heads (December 2008 – November 2009)*




In the period 2008 - 2009, slaughtering of pigs in specialized industrial units (slaughterhouses) in Romania increased by 16.5%, while pork production increased by 20.6%. One advantage is to be able to operate safe in case of need (for retrieval and removal of goods, to locate the source of the problem, to prevent the spread of the situation, stopping the increase in the number of people injured).

For any company located in a food chain, monitoring the use of traceability helps improve the image of her part, presenting attractive to consumers interested in knowing the origin of products, the conditions under which they were obtained, increasing also its strength competitive market. Also, monitoring reports may be obtained actual production and management, with repercussions on the growth of business competitiveness. Simultaneously, management is providing support in planning, organizing and conducting business and taking strategic decisions and current. The information is provided by engineers / technologies of the companies involved in the pathway, exerting its real-time monitoring and control activities.

Monitoring traceability is a complex activity, if we consider the many steps to be taken until a product reaches the consumer (to obtain agricultural raw materials, transportation, warehousing and storage, successive processing, etc..). Therefore it is necessary to use an adequate information system, focusing on computer component.

Meat producing companies built and strengthen consumer confidence

in their products, traceability has become a part of their market positioning. According to experts in the field, advantages and benefits of implementing a monitoring system for traceability can be grouped as follows:

• *preventive security*. Supports aspects of consumer confidence and distributors for products sold;

• *posibility of safe actioning*. If irregularities appear possible to find and withdraw the product is good or locating the source of the problem to prevent it spreading.

• *responsibility delimitation in the chain of traceability*. In case the source is known, distribution steps can be followed, and if a problem arises with those who could bear a responsibility to prevent and did a variety of reasons.

• *clear advantages of the user.* The quality system must be certified according to DIN EN ISO 9000. Thus, firms can develop a full quality management, from supplier to the final consumer. Specific rules, depending on the source material (eg pork), which must meet specific requirements different from those of other food products industry, enjoys specific integrated modules (eg traceability), so that the finished product be clearly identified;

• *Consumer confidence* by certifying a product's route through the various stages of production, from supplier to buyer;

• *compliance with legal requirements*. At each stage of production must comply with legal process;

• *obtaining reliable information*. This information is useful for manufacturers, distributors, trasportatorilor, traders, consumers and verification bodies and agencies;

• *represents an elastic concept.* Each company decides according to legal rules, standards and specific decisions on the depth of their own concept of traceability;

• *ensures quality control*. In a comprehensive system of enterprise management, quality control is an area of integration to ensure a transparent and traceable without omissions.

Thus, each functional area can be provided with information and points of taking control, from supply and to markets. Traceability system can carry out a careful control of inputs and outputs of production, allocating the correct data. Transparent planning processes secure internal audits are also part of quality management system, meaning that the user can achieve the exact quality standards compliance, better product quality and customer satisfaction and optimum management of complaints and returns;

• *can be integrated into ERP*. An ERP (Enteprise Resource Planning) is a complex multi-modular software application that integrates a company's business processes in order to optimize and increase their effectiveness. In terms of functionality, an ERP application covering the following areas of interest of a business: production planning, procurement management, inventory control, interaction with suppliers, customer relationship management, order tracking, financial management, human resource management.

## Conclusions

From the analysis we have developed the following conclusions:

- Traceability ensures a transparency for agro-food products and animal feed;
- Product traceability is achieved by the code identification;
- Having the total control of traceability over the production, exploitation can withdraw from the market in any moment their inadequate products. An effective traceability system, using the common language of computing, can imporve pork trade in Europe and even global markets;
- Monitoring traceability in pork production represents insurance of the company in terms of risk avoidance and thus of failures that are generating economic losses and damage its market position;
- Producers should use a transparent quality management according to HACCP and can demonstrate at any time without omission of origin certification.

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UDK: 347.453:631.1.017.3 (497.113)

# CHARACTERISTICS OF LAND TENANCY ON FAMILY FARMS IN VOJVODINA [1]

*Živojin Petrović, Dejan Janković*[2]

## Abstract

*Authors show the significance of land tenancy in the conditions of small and fragmented land property of family farms. The analysis was conducted on 1.513 selected family farms that take land on lease and cooperate with Agricultural extension service of Vojvodina on issues of agricultural production improvement. The authors explore how much land is being taken on lease, what is the relation between owned agricultural land and land on lease, what are the reasons for the taking land on lease, do the owners of the selected family farms have intentions to buy land and for what reasons. Also, the paper gives a review of some basic information on socio-economic characteristics of families that take land on lease.*
***Key words**: land tenancy, purchase of land, socio-economic characteristics of families that take land on lease*

## Introduction

Land tenancy is a complex social process that is historically determined and depends on various socio-economic and cultural factors (FAO, 2002). In open market agriculture, with domination of family model of production and family farm in private ownership, increase of agricultural land for production is possible to achieve by purchasing or taking land on lease. Considering that the purchase of land is a costly investment, better and more adequate solution for many farmers is the land tenancy. At last, land tenancy depends on demand of potential tenants, supply of available agricultural land funds and governmental and institutional regulation of land tenancy (or customs and other rules and regulations of local

1 The paper is a part of the research on project „Multifunctional agriculture and rural development in the function of accession of Republic Serbia into the European Union“ (MSTD, No. 149007).

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rural communities). Demand for land tenancy is greater if farmers (who have no sufficient owned agricultural land, but want to modernize and improve their agricultural production) estimate that taking land on lease will provide them with economic benefit. In other words, land tenancy demand depends on rational estimation of farmers whether agriculture will be cost-effective and profitable activity for their families.

On the side of supply of available agricultural land funds, land tenancy issue is objectively more complex because it depends on the social processes of "long duration". The most relevant of these are rural exodus, deagrarisation and demographic changes in rural communities (most of all, ageing and low or negative birth rates of rural population). If those processes are significant, many farmers and their families will decide to leave agriculture and rural areas and give their estates on lease or sale.

Family farms in Serbia are characterized by small owned land property composed of a large number of small plots (Božić i sar., 2004). Such anachronistic agricultural land structure of family farms in Serbia has well-known causes and there are numerous scientific studies to prove them[3]. Especially are well-known ideological and political causes of such land structure such as a measure of agrarian maximum (introduced 1953) which in the past decades - along with other measures of agricultural policy – has been legally restraining the increase of privately owned agricultural land and development towards the model of market orientated, commercial farms.

During the 1990s, it has been expected that the agricultural land structure of family farms in Serbia will change more rapidly due to the land purchase and, therefore, increase of the agricultural land owned by farmers. But, many economic and other reasons that characterize most of transitional societies prevent such expectations. Instead of buying land, many farmers have chosen to overcome shortage of agricultural land by taking land on lease. Serbian national statistics does not register data on land tenancy in a systematic and valid way even though such data and data on agricultural land market (especially agricultural land market between farmers) are very important indicators of change in agriculture and, also, social change in rural communities and Serbian society.

Therefore, in this paper authors analyze the widespread of land tenancy, relations between owned agricultural land and land on lease, reasons for taking land on lease, farmers' (who take land on lease) intentions for improvement of land resources *i.e.* resources for production and production structure on owned and land on lease. In addition, the authors give a short review of some socio-economic characteristics of families that take land on lease. The analysis is based on a sample of 1.513 family farms that take land on lease and cooperate with Agricultural Extension Service of Vojvodina[4].

3 As an illustration, see: Mitrović (1999).

4 For further information on concept of selected family farms and extension process see in: Janković, Petrović, Čikić (2010), Petrović (2007).

## Data resources

Data on land tenancy stem from the *System of information in agricultural extension of Vojvodina*. The *System*, in conceptual and methodological sense, enables registration of the full scope of information regarding extension agents` activities and socio-economic features of selected farm (Petrović, 2007). Data on land tenancy and all other information within the *System* are registered by extension agents based on their direct contact with the owners of the selected farms and their families over the past three years (period of one cycle of cooperation). Beside quantitative indicators on land tenancy, extension agents have also been registering their impressions on owned and leased land base for the agricultural production on farm[5]. That information is also taken into account while analyzing land tenure.

## Occurrence of land tenancy, reasons for taking land on lease and intentions of buying land

According to the data from the System of Information in Agricultural Extension of Vojvodina, out of the total of 3,147 selected family farms in Vojvodina that have cooperated with Agricultural Extension Service during the past three years 2,077 (66%) farms were taking land on lease, while 676 (21.5%) were not taking land on lease. For 394 farms (1.2%) there are no reliable data in the System of Information. Out of the total number of the selected farms, in this paper the authors will analyze 1,513 farms that were taking land on lease since for them there are reliable data for all the indicators regarding the land tenure issue. The data suggest that land tenure, at least among these farms, is a very common occurrence[6]. When comparing the average land owned by farmers and land on lease (Tab. no. 1.), it can be noticed that the average area on lease is larger (24.16 ha) than the area owned by farmers (16.68 ha).

5 Processing quantitative data on land tenancy for the purpose of this paper was done by Ivan Koči, author of software for the System of Information in Agricultural Extension of Vojvodina.

6 Data on land tenancy as a common occurrence in Serbian agriculture are also registered in national statistics (Popis, Poljoprivreda – knjiga 1, 2003: 20).

*Table No. 1. The structure of owned agricultural land and agricultural land on lease*

| Area (ha) | Owned agricultural land | | | Agricultural land on lease | | |
|---|---|---|---|---|---|---|
| | Number of farms | Total area owned by selected family farms (ha) | % of total area owned by selected family farms | Number of farms | Total area on lease by selected family farms (ha) | % of total area on lease by selected family farms |
| 0 ha | 15 | 0 | 0 | - | - | - |
| 0.01 – 3.0 | 133 | 255,0 | 1.0 | 245 | 471.4 | 1.3 |
| 3.01 – 5.0 | 110 | 453,5 | 1.8 | 172 | 732.6 | 2.0 |
| 5.01 – 7.0 | 141 | 865,0 | 3.4 | 125 | 781.3 | 2.1 |
| 7.01 – 10.0 | 245 | 2147. 0 | 8.4 | 194 | 1, 721.4 | 4.7 |
| 10.01 – 15.0 | 297 | 3, 708.0 | 14.5 | 175 | 2, 216.2 | 6.1 |
| 15.01 – 20.0 | 199 | 3, 503.0 | 13.7 | 128 | 2, 357.0 | 6.5 |
| 20.01 – 25.0 | 103 | 2, 346.5 | 9.2 | 80 | 1, 840.9 | 5.0 |
| 25.01 – 30.0 | 81 | 2, 253.1 | 8.8 | 85 | 2, 432.3 | 6.7 |
| 30.01 – 35.0 | 44 | 1, 446.0 | 5.7 | 57 | 1, 891.1 | 5.2 |
| 35.01 – 40.0 | 47 | 1, 788.8 | 7.0 | 48 | 1, 878.2 | 5.1 |
| 40.01 and > | 98 | 6, 737.3 | 26.4 | 204 | 20, 237.1 | 55.4 |
| Total | 1, 513 | 25,503.0 | 100.0 | 1.513 | 36, 559.5 | 100.0 |
| Average on family farm (ha) | 16,68 | | | 24,16 | | |

The data from the Table 1 point to a very interesting phenomenon. If we consider the total number of farms and their owned agricultural land within the interval 7.01-30.0 ha it is evident that 61% of the farms own 55% of the land. An even more interesting fact is that farms that own more than 40 ha have the share of 6.5% of the total number of the analyzed selected farms, but own almost 27% of the land. Analyzing the same intervals in *ha* of the land taken on lease, the group of farms (that was taking land on lease from 7.01-30.0 ha) has the share of almost 44% of the total number of farms and the share of almost 29% of the land taken on lease. *The most interesting fact is that a group of the farms with 40.01 and more ha of the land taken on lease (having the share of 13.5% of all the selected farms) takes 55.3% of the total amount of the land taken on lease.* In a nutshell, the above stated data point to a significant polarization of bigger and smaller farms regarding the issue of the owned land and especially regarding the issue of the land taken on lease. This is a phenomenon that has significant economic and social consequences, but in this paper, unfortunately, we cannot pay more attention to it. The already mentioned groups of bigger farms surely represent the basis of the farm sector in agriculture of Vojvodina. Furthermore, regarding the land base of agricultural production on family farms, we might assume that the farms that own more agricultural area also take more land on lease, but the table presented (Table 1) provides no empirical ground for this assumption.

Decision on taking land on lease is a complex one. It depends on the size of owned agricultural land, production structure and production orientation, economic position of agriculture in general and many other factors related to farms and farmers' families. For

many farmers, land tenancy is not permanent but only temporary solution, especially for those whose livelihood depends solely on agriculture and who have intentions in expanding land base for their agricultural production. Therefore, land tenancy is always closely related to farm owners' intentions in the purchase of the agricultural land (Tab. No. 2 and No. 3).

*Table No. 2. Reasons for taking land on lease*

| Reason | Number of farms | % in total number of farms |
|---|---|---|
| 1. Insufficient owned agricultural land | 1 493 | 95.2 |
| 2. Affordable rent | 41 | 2.6 |
| 3. Better and more rational use of existing agricultural machinery | 5 | 0.3 |
| 4. Favourable position of the area taking on lease | 14 | 0.9 |
| 5. Social reasons (taking land on lease from cousins) | 11 | 0.7 |
| 6. Specifics of agricultural production | 4 | 0.3 |
| 8. Other reasons | 1 | 0.1 |
| Total | 1 568 | 100,0 |

As it was expected (Tab. No. 2.), insufficiency in owned agricultural land is the main reason for taking land on lease (95.2%)[7]. In the second place is affordable rent (2.6%). Due to the fact that land tenancy, in Serbian society, is much more financially reasonable solution than the purchase of land, it could be interpreted that affordable rent as a reason for taking land on lease is more likely present among farmers who take land on lease because they do not have agricultural land on their own. Other reasons are significantly underrepresented, but also important for the analysis. It is central to point out that some farm owners take land on lease not only for economic reasons, but because of the favourable position of the land available for lease or because land available for lease is owned by elderly cousins who due to the age or for some other reasons do not cultivate their own agricultural land[8].

*Table No. 3. Intentions of land purchase*

| Reason | Number of farms | % in total number of farms |
|---|---|---|
| 1. Expanding farm production | 1 335 | 88.2 |
| 2. Affordable price | 6 | 0.4 |
| 3. Both mentioned reasons | 35 | 2.3 |
| 4. Other reason | 29 | 1.9 |
| 5. No intention in purchasing land | 108 | 7.1 |
| Total | 1 513 | 100.0 |

7 Total number of farms and total number of reasons are not even because some farmers chose more than one answer in expressing their reason for taking land on lease.

8 In Serbia, on average, 4% of total arable agricultural area is not cultivated. For Vojvodina only, it is a loss of 13 million EURO per year, in value of primary agricultural products (Bošnjak, Rodić, 2010).

As already mentioned, land tenancy is also closely connected to farmers' intentions and reasons for purchase of agricultural land (Tab. No. 3.). Presented data show that farmers have strong intentions to buy land, mostly because they want to expend their agricultural production (88.2%). This reason is usually related with some other reasons that determine the decision on land purchase. Beside affordable price, according to the extension agents` opinions, many farmers would like to buy land because there is a family member who will continue to practice agriculture on the family farm, because of the favourable position of the land which can be bought or because of the more rational use of existing agricultural machinery and possibilities for cultivating more land. Some farmers stated that purchasing land is a good and safe investment and others want to buy land from the cousins (which imply that purchase of land is not only motivated by economic reasons, as it is sometimes assumed).

## Some socio-economic characteristics of families that take land on lease

Family farm and rural family have always been closely related. Vukosavljević claimed that rural family is some sort of „working partnership" based on traditional labour division and family values system which regulate not only relations between family members, but also relations between family as a social group and farm as an economic base for rural family existence. In the open market agriculture, the relation between rural family and family farm is even more complex because of the distinctive social changes. This also refers to the land tenancy and decision of family members to take land on lease as a solution for expanding their production land base and, thus, ensuring the family existence. There are no researches on relation between socio-economic characteristics of the family and land tenancy in Serbian sociology. Thus, the authors present some of the empirical information on basic socio-economic features of the families that take land on lease.

The relation between the farms that take land on lease and their families is undoubtedly complex due to the fact that land tenancy does not simply depend on economic factors, but also on socio-economic characteristics of rural families' members. The results of this research show that between farms that take land on lease prevail those with families consisting of five and more members (42.2%) and with three and more generations (43.4%). Average age of farm owners and their spouses is 46 years[9]. Of total 3,337 members of the families that take land on lease, 84.7% have no official employment and 4.8% are retired. The results show that most of the farm owners who take land on lease and their spouses have secondary school degree (61.2 %) and 6.2% have a faculty diploma which imply on favourable educational structure. Land tenancy also should be examined compared to family farms` owners and their spouses` occupation. According to the data, almost $^1/_3$ of all family farms` owners and their spouses are farmers, 25.4% of them work as clerks and experts with college and university diplomas and 20.5% of them are housewives.

9 On relation between land tenancy and elderly rural population, see: FAO (1999), Miladinović (2010).

## Conclusions

According to the presented data, it is a general conclusion that taking agricultural land on lease depends on whether family consider agriculture as their primary economic activity. Also, data showed that there is significant polarization of the farms regarding the farm size of the property and especially of the land taken on lease and this implies important social and economic consequences on the further development of agriculture in Vojvodina. Furthermore, families who take land on lease have more members and complex generation structure. Also, land is more often being taken on lease in those families whose members have above-average education (compared to educational structure of total rural population in Serbia) and families with no or few members employed outside the farm.

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UDK: 663/664:658.562.6

# A PERSPECTIVE OF STANDARDS AND REGULATIONS FROM THE FOOD SAFETY AREA

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## Abstract

*The food safety and security represents one of the most important domains for many countries and organizations in the last period of time. This paper will present a short overview about the concept of food traceability. Some of the most important international standards regarding food safety are presented. Conclusions and future directions of the research are discussed.*

***Key words**: food safety, food safety standards and regulations, traceability system*

## Introduction

In the last decade the food safety and security represents one of the most important issue for many researchers, organizations and governments. This fact was determined by the actual economic context, which conducted the agro-food economy to be focused on a responsive fulfillment of consumer demands regarding quality, safety and security of food and foodstuff (Wolfert et al., 2010). Therefore, the EU legislation, determined a framework that gives to the end-consumer important rights regarding safe-food and, in the same time, accurate and honest information regarding food.

In the Regulation (EC) No 178/2002 of the European Parliament and of the Council it is specified that **food** (or **foodstuff**) represents "*any substance or product, whether processed, partially processed or unprocessed, intended to be, or reasonably expected to be ingested by humans*", including "*drink, chewing gum and any substance, including water, intentionally incorporated into the food during its manufacture, preparation or treatment*".

In the national or international regulations or standards exists many definitions regarding the concept of traceability:

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The Regulation (EC) No 178/2002 of the European Parliament and of the Council states that the **traceability** represents "*the ability to trace and follow a food, feed, food-producing animal or substance intended to be, or expected to be incorporated into a food or feed, through all stages of production, processing and distribution*".

Global GAP defines the **traceability** as "*the ability to retrace the history, use or location of a product (that is the origin of materials and parts, the history of processes applied to the product, or the distribution and placement of the product after delivery) by the means of recorded identification*".

ISO 22005:2007 considers that the **traceability** represents "*ability to follow the movement of a feed or food through specified stage(s) of production, processing and distribution*".

Codex Alimentarius considers that the **traceability** represents "*the ability to follow the movement of a food through specified stage(s) of production, processing and distribution*".

GS1 standards states that the **traceability** represents "*ability to track forward the movement through specified stage(s) of the extended supply chain and trace backward the history, application or location of that which is under consideration".*

The Australian standards defines the **traceability** as "*the ability to, and the mechanisms designed for, the tracing of an animal product along all steps in the production chain back to the farm from which the product was derived*".

The Romanian Law 150/2004 regarding food and feed safety defines **traceability** as "*the ability to identify and trace over all stages of production, processing and distribution food, feed or food-producing animal that will be used for food or substance production which will be incorporate or can be incorporated in a food or feed*".

Taking into consideration all these definitions we can conclude that the **traceability** represents the ability to trace back a food to its origins and furthermore, to trace back all the components of that food to origins (using data and information stored in traceability systems).

A traceability system has two main objectives: (a) to identify the foods that can be dangerous for human consumption in order to recall those products from the sale; (b) to trace back the product on the supply chain food in order to identify where the problem appear and which are the causes that generated the problem in order to prevent new apparitions of the problem.

## International Standards

Some of the most known international standards regarding the process of traceability for foods are: GLOBALGAP, Codex Alimentarius' food safety standard HACCP, GS1 - Global Traceability Standard, ISO 9001 and ISO 22005.

**GLOBALG.A.P**

GLOBALG.A.P is a private sector body that has developed and continuously

updates sets of standards in order to certify the agricultural products. The objective GLOBALG.A.P is "*to establish one standard for Good Agricultural Practice (G.A.P.) with different product applications capable of fitting to the whole of global agriculture*".
An initiative from the retailers belonging to the Euro-Retailer Produce Working Group (EUREP) determined in 1997 the establishing of the EUREPG.A.P. In the context of globalization, after 10 year of expertise in the domain of elaborating and implementing standards for certifying agricultural products, in 2007 the Board announced, during the 8th global conference in Bangkok, that the new name of the body is GLOBALG.A.P.

GLOBALG.A.P developed the following standards: (1) GLOBALG.A.P Integrated Farm Assurance Standard (IFA); (2) GLOBALGAP Compound Feed Manufacturer Standard (CFM); (3) GLOBALG.A.P Plant Propagation Material Standard (PPM); (4) GLOBALG.A.P Risk Assessment on Social Practice (GRASP).

According to the GLOBALG.A.P website, Integrated Farm Assurance (IFA) Standard represents "a *single integrated standard with modular applications for different product groups, ranging from plant and livestock production to plant propagation materials and compound feed manufacturing*". The scope's typology of the farms that are covered by IFA is: (a) crop base; (b) livestock base and (c) aquaculture base, for each scope being defined more sub-scopes:

- Crop Base (CB)
  - ✓ Fruit and Vegetables (FV)
  - ✓ Combinable Crops (CP)
  - ✓ Coffee - green - (CO)
  - ✓ Tea (TE)
  - ✓ Flowers and Ornamentals (FO)
- Livestock Base (LB)
  - ✓ Cattle and Sheep (CS)
  - ✓ Dairy (DY)
  - ✓ Calf / Young Beef (CYB)
  - ✓ Pigs (PG)
  - ✓ Poultry (PY)
  - ✓ Turkey (TY)
- Aquaculture Base (AB)
  - ✓ Finfish (FN)
  - ✓ Molluscs (MC)

## Codex Alimentarius

Another important organism is represented by the Codex Alimentarius Commission (CAC) which was founded by the Food and Agriculture Organization (FAO) and the World Health Organization (WHO) in 1962. Codex Alimentarius represents a set of standards, good practices and recommendations, one of the most important issues

adopted by CAC being Hazard Analysis and Critical Control Point (HACCP) system, which identifies, evaluates, and controls hazards which are significant for food safety. The HACCP system is based on the following principles: (a) conduct a hazard analysis; (b) determine the critical control points (CCPs); (c) establish critical limit(s); (d) establish a system to monitor control of the CCP; (e) establish the corrective action to be taken when monitoring indicates that a particular CCP is not under control; (f) establish procedures for verification to confirm that the HACCP system is working effectively; (g) establish documentation concerning all procedures and records appropriate to these principles and their application.

## GS1

GS1 is an international not-for-profit association which design and implement global standard and provide solutions in order to enhance the efficiency of supply chains. GS1 was founded in 1977 by 12 organizations from Europe and in 2005 changed his name from EAN (European Article Numbering) International into GS1. According to GS1 website, "*The GS1 system of standards is the most widely used supply chain standards system in the world*". From GS1 point of view, the traceability is a business process which describe the key element "independently from the choice of enabling technologies" and, in the same time, it is defined a set of minimum requirements that must be fulfill for each company.

## Conclusions

The using of an information system for monitoring the traceability on the wine supply chain can represent an activity which can generate some important advantages:

- enhancing food safety and security (Liddell and Bailey, 2001);
- increasing the trust of consumers in the acquired foodstuff;
- enhancing the protection of the consumers against fraud or the producers from competitors from "black market" (Golan et al., 2002).

The process of designing, developing and implementing traceability systems by companies represents a proactive approach to manage food safety and security.

## Acknowledgement

This work was co-financed from the European Social Fund through Sectoral Operational Programme Human Resources Development 2007-2013, project number POSDRU/1.5/S/59184

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Economics of agriculture
SI – 2
UDK: 631.111.3:504.05/.06

# RURAL ENTREPRENEURSHIP AND SUSTAINABLE ECONOMIC DEVELOPMENT IN SERBIA

*Mirjana Radović Marković*[1]

## Abstract

*Rural development is linked to entrepreneurship to a greater extent than ever before. Institutions and individuals promoting rural development now see entrepreneurship as a strategic development intervention that could accelerate the rural development process. Rural entrepreneurship has an enormous employment potential. Women see it as an employment opportunity near their homes which provides independence and reduces the need for social support. Farmers see it as an instrument for improving farm earnings and achieving a better standard of living. However, the acceptance of entrepreneurship as a central development force by itself will not result in rural development and the advancement of rural enterprises. What is also needed is an environment in rural areas conducive to entrepreneurship. The author points out that the creation of such an environment starts already at the national level with the foundation of policies for macro-economic stability. In addition, she discusses what local communities can do to foster rural entrepreneurship in general.*
***Key words:*** *Rural development, rural entrepreneurship, developed countries, countries in transition, Serbia*

## Introduction

Rural development has in recent years been increasingly taking the leading role in the development of rural regions. This is due to a number of factors. In the first place, the traditional economic activities based on routine production in agriculture and the activities based on the use of natural resources continually struggle to survive and be competitive on the global market. In order to achieve these goals, it is necessary that the agriculture development strategy should be changed. It is for this reason that experts in this field make attempts to discover new sources that would help raise competitiveness. Hence a vast majority of researchers introduce new concepts and possibilities that

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can be implemented in creating a new and sustainable economic development of rural regions. This development can be defined as "sustaining wealth and improving the production competencies of rural local communities or a long-term building of a stimulating environment that will foster these competencies" (Andrew F. Fieldsend and János Nagy, 2006).

The new approach that has been developed in the last decade is linked to the "bottom-up" rural development. This approach is based on the importance of the development of a community aided by local entrepreneural initiatives and a clearly set goal to ensure a balanced technological development of rural regions. This balanced technological development of rural regions is meant to offer better employment opportunities and a higher quality of living. Namely, this approach allows for equal chances for the agricultural regions to develop as fast as urban regions.

## Rural entrepreneurship – concept and definition

Rural entrepreneurship is a most recent research area the scientists deal with in the entrepreneurship study. In recent years it has gained in importance as the prevailing method of fostering rural development. Important as it is, rural entrepreneurship has, nevertheless, been clearly defined only recently. In this domain, however, there is no universal definition, nor a universal concept of rural development study. It is for this reason that we attempted to formulate our own definition of rural entrepreneurship that would be all-comprehensive both in its essence and in the aspects it covers. Accordingly, we define rural entrepreneurship as creating entrepreneur cooperatives that will ensure crucial economic, social and other changes in rural regions and improve these regions (Radović Marković, M. 2009). This also includes the promotion of rural entrepreneurship and its fostering by the state as well as devising a rural development policy based on investing into rural entrepreneurship. Besides, it is necessary that our attention be focused upon the causes of low profitability of agriculture in the developing countries and in many transition countries, Serbia included. A majority of these countries is characterised by obsolete technology, poor professional training of labour force in rural regions, etc. Hence rural entrepreneurship emerges in economically and socially backward regions, those with inadequate infrastructure, low level of education, unskilled work force and low incomes, where the level of local culture does not support entrepreneurship (Kulavczuk, 1998).

Since the rural development policy has to observe local, regional or national aspects and potentials, it is not possible to formulate the best model of rural entrepreneurship development that would have a universal meaning and implementation.

## Rural entrepreneurship concept – old and new concepts

The earliest and the most important concept of entrepreneurial activity in the agricultural sector is the "*production*", as it was basically most important to produce enough food to feed the members of the community. This concept remained a prevailing one in the fifties and the sixties of the past century. In time, however, it became evident that this production concept cannot be the only one; therefore it was broadened by

introducing the "*price concept*" into the agricultural development policy. Since the farmer himself had no real influence upon pricing on the level of the pricing policy[2], the farmers' activities were limited to solely observing and data collecting. The farmers' responsibilities were thus constrained and this concept was promptly replaced by another whose aim was to increase their responsibility. It was then that the concept of "*cost structure optimization in the organization*" was introduced. This concept, however, was not oriented towards the future business challenges, nor did it observe the changes in the external business environment. In the 1990s it was replaced by a new concept, based on the "rural entrepreneurs' creativity and flexibility". The core task of this concept was to new solutions to problems as well as new products. The trend was to develop small markets, be oriented to certain target groups and use new methods in solving problems.

## Basic limitations in development of rural entrepreneurship in Serbia

The greatest limitation of entrepreneurship development in the agricultural sector is the lack of financial resources. There is always a risk for a peasant's investment, especially if it is an investment in agricultural production because of its specifics (weather conditions, biologic potential of plants and animals, and finally the market of agricultural products). Most peasants avoid risky investments because they know that in the case of bankruptcy, they can lose, not only „enterprises", but the business as a whole (Stamatovic and Vemic, 2009). For potential external private investors in rural environments, there are some limits which preclude faster capital flow in rural regions. In addition, the problems which agricultural sector in Serbia meets are mostly related to small volume and low quality of agricultural production, unsolved ownership transformation, inadequate possessed structures, undeveloped infrastructure etc. This complex situation of rural area is also burdened by depopulation, the problem demographic aging of population, low level of living standard, problems of social isolation and ecological problems.

There is also a limited potential in terms of education, scale, the strength and flexibility of the work force. Namely, agribusiness (small or medium) is very professional and focused on technology and require a certain level of education. The education structure of the rural population over 15 years of age is unfavourable. In the structure of the rural population over 15 years the majority (36.9%) has secondary schooling, 27% has completed only elementary school and 28% are illiterate or without any formal education. Only 7% of the rural population over 15 has attended college or 5.2% of the rural working population (CEEC AGRI POLICY, 2007).Uneducated workforce precludes investments into business and entrepreneurial activities.

The new technology and the internet should help lessen the gap between the urban and the rural areas. In other words, implementing IT tools and new models of

2 Gannon, A. and Petrin, T. (1997), FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, FAO

delivery knowledge and obtaining specific training and community workshops should allow business ideas to be easier shared and stimulate business activities in rural areas.

In overcoming all these obstacles, there are actions to be taken by government, financial institutions and social enterprises. Social entrepreneurship overcomes the gap between the business and the public sectors, and support rural entrepreneurship development. These socially oriented enterprises have attempted to address social problems such as community development, offer educational opportunities and environmental protection, among others. Social entrepreneurs could contribute to sustainable agriculture through organic production of food products, cotton textiles, herbs, spices and more. In addition, community-based agriculture has also the potential for creating jobs, developing small business entrepreneurships .Social entrepreneurship can be outlined as the process of involving innovative use of resources to create a sustainable business (Radovic-Markovic, M., 2009). The role of social entrepreneurs is now recognized in developed countries as important, and it should be also vital for our future.

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## Fostering rural entrepreneurship development in Serbia

The role of agriculture in the Serbian economy is traditionaly highly important. The agricultural land in Serbia covers an area of 5,092 hectares, 80.5 percent of which is owned by individual farmers (individual farms), whereas the rest is the ownership od organizations, cooperatives and the state. Approximately 70% of the territory of Serbia can be classed as a rural area inhabited by 43% of the total number of the country's population, which shows a high potential for the rural entrepreneurship development. Also, a large number of the population of Serbia is engaged in this sector. The employment rate in agriculture ranks among the highest in the EU (21% in 2008) and reflects an omnipresent high importance of agriculture in the national economy as well as a low level of diversification of economic activity in the rural areas of Serbia. The result of this is the lack of employment opportunities, which is in turn the cause of a growing poverty in the rural areas (the Plan of the rural development strategy of Serbia, 2009-2013).

The difference between the employment rates of women vs. men (15 – 64 of age) was reduced in the 2005 – 2009 period, however, it still remains rather big. In 2005 the employment rate for men amounted to 61.2%, whereas it was 40.8% for women, while in 2009 the employment rate for men fell to 58.7%, that of women increasing to 43.3%. This trend reflects an increasing number of women in the agricultural sector (40.2% in 2005 and 42.4% in 2009).

The agricultural output increased by 2.5% (2009) in comparison with 2008, despite the global economic crisis that had a negative impact upon Serbian economy as well. This supports the assumption that the Serbian agricultural sector is still an important sector of the national economy. Due to a hard period of transition Serbia is going through, however, a large number of farmers encountered a serious dilemma of how to sustain their regular production. A need also emerged for joining into cooperatives and forming farmers' associations, in order that all modern agricultural measures and technologies should be implemented to reduce production costs and overcome this

difficult period. There is also being created an increasingly favourable environment and support to the rural entrepreneurship development. These are further enhanced by numerous new laws that are already enacted. One is the Law on agriculture and rural development passed in May 2009. Simultaneously, the National agricultural programme for the 2009-2011 period was adopted. In addition to the Law on agriculture and rural development, the Serbian parliament adopted 14 important acts in 2009, submitted by the Ministry of Agriculture, Forestry and Water Management. New laws and reforms in agriculture are meant to improve the rural policy in Serbia and support an integral rural development. This new concept is to help achieve the following goals:

- Develop rural entrepreneurship;
- Professionall improve and train the rural areas population to start agribusiness;
- Increase profitability in agricultural production;
- Reduce the lagging of rural regions in comparison with the urban ones.

In the development of rural entrepreneurship in Serbia the following important guidelines are to be defined, an they are related to:

- ✓ Fostering the setting up of businesses, but also motivating entrepreneurs to continually improve them;
- ✓ Networking of entrepreneurs in order to define the areas that can bring highest profits, which should help business activities planning and orientation;
- ✓ Entrepreneurs should make decisions which will be in favour of both their own business and their environment;
- ✓ In creating entrepreneur activities entrepreneurs should pay attention to environmental protection,
- ✓ Provision of a better future for the rural households and reducing migrations of young people into cities;
- ✓ The state institutions are to appreaciate the value of rural entrepreneurship and incorporate it into the economic strategy of the country development, as well as support its development. They are also to aid individual entrepreneurs transfer their activities from the informal into the formal sector of economy, thus contributing to their respective local communities by paying taxes. Special programmes should be devised to help and support women, young labour force, old persons and the self-employed. In this way their better social inclusion would be ensured.
- ✓

The orientation of the rural entrepreneurship development in the above-mentioned manner would bring major benefits not only to the local community but for the entire society in several of its domains, such as:

- ➢ **A larger number of entrepreneurs** – an increased number of new businesses;
- ➢ **More competent entrepreneurs** – entrepreneurs who have the knowledge and skills in the business they do;
- ➢ **Growth and expansion of businesses** – businesses boost production and sales,

as well as create new jobs thus absorbing local labour force;

- **Economic benefits for the local community** – by way of tax payments.

## Conclusion

Creating small businesses in rural areas is of great importance for the restructuring and modernization of the rural regions/villages, for improving the living conditions, creation of new jobs and self-employment of labour force. This also includes creating the state policy whose programmes are to aid the development of entrepreneurship. An efficient concept of rural entrepreneurship has to focus upon the transformation of the local business culture and be adopted by the local rural population as their own choice of career. Such a transformation cannot be achieved only by implementing state programmes. These concepts should also be studied at schools, among young people who should acquire education in entrepreneurship while they are still very young.Absence of young ,capable for work and educated farmers,infrastructural undevelopment can make impossible investments for rural entrepreneurship as one of preconditions for suistainable economic development in Serbia.

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Economics of agriculture
SI – 2
UDK: 316.334.55:17.023.36 (497.11)

# RURAL INFRASTRUCTURE AND THE ROLE OF SOCIAL CAPITAL IN SERBIA

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## Abstract

*The starting point of this research is the assumption that infrastructural development in Serbia could be the key to economic growth. The aim of this research is to present an overview of the level of development in rural Serbia with a focus on infrastructure. The research compares twelve rural Serbian districts on the basis of data about the three categories economic performance, infrastructure development and social capital. Outcomes of the research are an analysis of the relations between the three categories and a comparison of the Serbian districts. The two main findings of this research are that the positive influence of infrastructure on economic development is not convincingly proven for Serbia and that the relation between economic development and social capital (measured by election data) turns out to be negative instead of positive.*
***Key words:*** *Rural development, rural infrastructure, social capital*

## Introduction

This paper focuses on rural districts in Serbia. It compares the districts on the basis of data about the economic performance, the infrastructure development and the level of social capital. Serbia is an interesting country to look at, mainly because of its history as a former Yugoslavian country and its future accession to the EU. The status of Kosovo (under UNSCR 1244) is of major debate, therefore Kosovo will not be included when talking about Serbia.

The research is limited to rural areas first of all because high unemployment levels and poverty in rural areas in Serbia cause migration to the cities. Depopulation takes place in the rural areas, leading to economic and social problems in these areas as well as in the big cities. Another reason for focusing on rural regions is that rural development is an important part of the EU legislation and a large budget is spent

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on rural policies. Already in the pre-accession period Serbia receives financial aid for bringing its rural policies into conformity with the EU rural policies. Infrastructure is an important part of rural development. It is thought that infrastructure development contributes to economic development. As the quality of the road network in Serbia remains weak, it is interesting to look at infrastructure and its relation with economic development.

The aim of this research is to present an overview of the level of development in rural Serbia with a focus on infrastructure. The research looks at the relation between infrastructure and economic development and the possible influence of social capital. The outcomes can complement to the literature already existing about rural areas in Serbia and can be useful in the pre-accession period of the country. Furthermore, the outcomes will contribute to the discussion about the importance of investing in rural infrastructure.

The remainder of the article is organised as follows. Sections 2 and 3 give a theoretical overview and Sections 4 and 5 describe the data analysis. Finally, Section 6 contains the conclusion and discussion.

## Infrastructure

Infrastructure development is one aspect of rural development policies. Different sources give different definitions of infrastructure. The definition of the UNDP (2008) is very broad, describing four key types of infrastructure that have an influence on human development: energy, transport, telecommunication and the environment. Also the interpretation of the World Bank (2010) is very extensive. Indicators used by the World Bank to describe infrastructure range from rail lines and electric power consumption to internet subscribers and daily newspapers.

Infrastructure in this research is limited to a more narrow definition, namely the road network (motorways, highways, secondary roads and rural roads). Well-developed infrastructure is generally described as very important for economic growth and rural development. The positive effects of infrastructural development mentioned by UNDP (2008), Nemes (2005), ERF (2010) and Escobal (2005) among others can roughly be divided into benefits for trade, society, investment and employment. Concerning trade, a well-developed road network improves access to the market, lowers transaction costs and stimulates trade with other regions. For society well-developed infrastructure stimulates the freedom of movement and social integration, thereby lowering isolation. Moreover, regional inequalities are lowered and the rural population gains more income due to improved trade. A region that is easily accessible due to developed infrastructure can attract more investments from outside the region and can gain more income from the tourist sector. Finally, well-developed infrastructure has shown to be important for employment: jobs are created, unemployment is lower and there are opportunities to commute to work and to find a job in non-agricultural sectors.

## Social Capital

Social capital, together with other forms of capital, explains the increase or decrease of productivity. Well-developed social networks and interaction make lives more easy and productive and social capital is therefore used as a factor to explain economic success. Different definitions of social capital, including those of Durlauf (2004), Putnam (2000), Danchev (2005) and Paldam (2000), have been developed. First of all, researchers talk about a group of people, socially connected with each other. They share certain ways of interaction, knowing what they would do for each other. The way they interact stimulates them to work together, increase their productivity and reach common goals. The interaction occurs under common rules and norms, trust in each other and reciprocity.

Social capital is defined in this research as *the interaction in a group, like norms, trust and reciprocity, stimulating the achievement of a common goal*. As it is very difficult to find useful and sufficient data concerning levels of social capital in Serbia, this research selects one variable used to measure social capital, namely election turnouts. Election turnouts reflect the trust citizens have in their government and this trust is an important aspect of social capital. Bronisz and Heijman (2010) among others indicate election turnouts as a way of measuring social capital. Literature reviews show that social capital stimulates economic growth and therefore it is expected that richer districts have higher election turnouts (as an indicator of the level of social capital).

The role social capital could play in the development of rural infrastructure can go two ways. First of all, the development of infrastructure is less complicated when all the actors involved in building a road can work together without problems. The second role social capital can play is in the use of the road network. Modern roads between two rural communities are of no use when the two communities do not interact, i.e. when there is no trade or shared activity. A high level of social capital could therefore increase the benefits from infrastructure development.

## Methodology

In this study a data analysis will be performed consisting of two parts. Data is collected from the Statistical Office of the Republic of Serbia about twelve districts in Serbia. The first analysis will rank the districts according to their performance on the following three categories: infrastructure development, economic development and election turnouts (as a variable for social capital). The second part will analyse relations between the three categories. The research is based on data analysis mainly because it is an objective and efficient way to compare the districts in a short period of time.

This study is limited to twelve of the 24 districts in Serbia. The districts are selected according to the typology of Bogdanov et al. (2008). As this research focuses on rural areas, all districts with municipalities that are categorized as urban are left out of the research.

The following twelve districts remain:

| | | | |
|---|---|---|---|
| ▪ West Bačka | ▪ Central Banat | ▪ Raška | ▪ Pirot |
| ▪ North Bačka | ▪ Kolubara | ▪ Toplica | ▪ Zaječar |
| ▪ North Banat | ▪ Zlatibor | ▪ Pčinja | ▪ Bor |

Three categories are of importance for this research: infrastructure, economic development and social capital. For all three categories data is collected.

With this data indexes have been made. The indexes are computed from the standardized values of the variables. Data about the economic performance of the districts consists of the GDP per capita, net wages and unemployment level. It will show differences in income and job opportunities between the districts as variables for the level of economic development. The index of economic development is calculated as follows: Economic Development ECODEV = (zGDP+zUnempl_r+zWage)/3. Unemployment is in this case reversed, because it has a negative influence on economic development. The index for infrastructure is the average of the standardized values of: length of roads, modern surfaced roads as percentage of total roads, length of highways, length of highways with modern surface, length of regional roads, length of regional roads with modern surface, length of local roads and length of local roads with modern surface. This index will give a good overview of the quality and quantity the regional infrastructure. The index for social capital consists of election turnouts for local governments, as this is one of the main variables for social capital mentioned in the literature and it reflects the trust people have in their government.[2]

All data is retrieved from the Statistical Office of the Republic of Serbia (RZS, 2009 and 2010). The advantage of using one source is that differences in measurement are minimized. For the analysis, the statistical programme SPSS is used. For looking at the relations between variables the Pearson correlation coefficient is used. The significance level is 0.05 unless mentioned otherwise.

## Results

In Table 1 the districts are ranked according to their scores on election turnouts and the indexes of economic development and development of infrastructure. The most notable ranking can be seen in the economic development column. There is a very clear distinction

2 In fact Social Capital is a complex multivariate concept. However, due to a lack of data we have confined ourselves to election turnouts as the single indicator for social capital. This would be an interesting area for future research.

between regions in the north and regions in the south. When Serbia would geographically be divided into two parts, Kolubara and Bor would be at the borders of the northern part and Zaječar and Zlatibor would be the beginning of the southern part. Concerning economic development, all districts in the northern part have positive indexes and all districts that are located in the south have negative indexes. This indicates that the northern part of the country has a better developed economy than the south.

Concerning election turnouts a geographical distinction is less clear, but in general it could be said that in the south more people vote. Some rankings are totally opposite compared to economic development. West Bačka is ranked number 1 when looking at economic development, but number 12 when looking at election turnouts. Vice versa, Pirot and Toplica have the lowest index for economic development but the highest for election turnouts.

Concerning infrastructure development, it is harder to make a general statement. The district with the highest index is Kolubara, whereas Bor scores the lowest. The numbers 10, 11 and 12 in the ranking are located each in different parts of the country: the north, the middle and the south. Therefore also geographically it is hard to find a relation.

*Table 1 - The ranking of the districts*

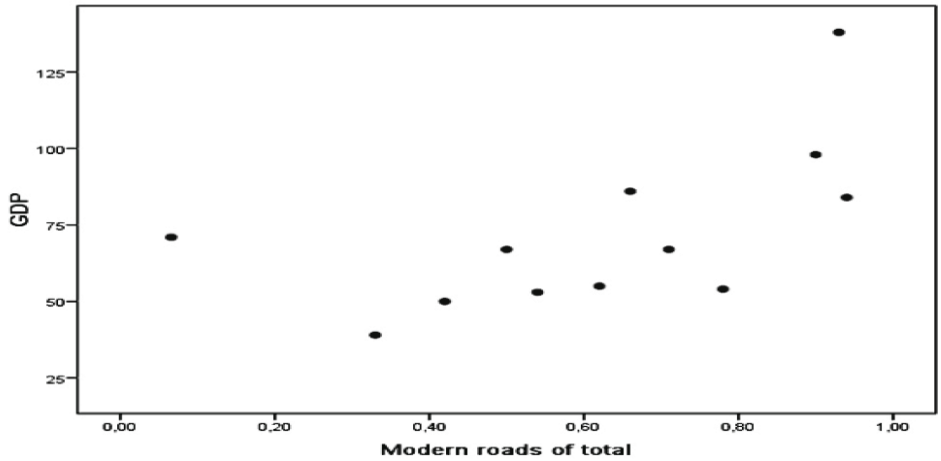
| District | Economic Development Index | Rank | Social Capital Index | Rank | Infrastructure Index | Rank |
|---|---|---|---|---|---|---|
| North Bačka | 0.919 | 2 | -0.433 | 8 | -0.133 | 10 |
| Central Banat | 0.376 | 6 | -0.993 | 11 | 0.016 | 8 |
| North Banat | 0.886 | 3 | -0.013 | 6 | 0.022 | 7 |
| West Bačka | 1.128 | 1 | -1.338 | 12 | 0.033 | 6 |
| Kolubara | 0.545 | 4 | 0.623 | 4 | 0.768 | 1 |
| Bor | 0.443 | 5 | -0.903 | 9 | -1.153 | 12 |
| Zaječar | -0.379 | 8 | -0.989 | 10 | 0.113 | 5 |
| Zlatibor | -0.020 | 7 | -0.128 | 7 | 0.304 | 2 |
| Raška | -0.801 | 9 | 0.729 | 3 | 0.258 | 3 |
| Toplica | -1.091 | 12 | 1.249 | 2 | -0.116 | 9 |
| Pirot | -1.029 | 11 | 1.916 | 1 | -0.329 | 11 |
| Pčinja | -0.978 | 10 | 0.281 | 5 | 0.217 | 4 |

When looking at the data about the twelve districts, is it clear that the northern districts perform better on economic development than the southern districts. They have higher GDP's per capita, higher net wages and lower unemployment levels. Ranked on the first place is the district West Bačka and ranked on the last place is Toplica. Noticeable when looking at the development of infrastructure is that the districts in the north have lower road densities than the south, but in turn have the best quality of roads. An explanation for the low road density can be found in the geographical characteristics of the north: the area consists of flatland, with a small number of settlements with a high population density. Kolubara is the district ranked on the first place, Bor comes in last. Against the expectations gained from the literature, the regions which score low on economic development have the highest election turnouts. West Bačka, which was

ranked on the first place concerning economic development, is ranked on the last place concerning election turnouts. Pirot has the highest election turnouts.

The main question to be answered in this paragraph is the following: Is there a relation between the development of infrastructure and the economic development in the Serbian districts? The correlations between the GDP per capita and the variables of infrastructure development (length of roads, roads per km$^2$ and modern roads) were calculated. It was found that significant correlations exist between the GDP and roads per km$^2$ as well as between the GDP and modern roads. The relation between the GDP and the modern roads as a percentage of total roads is positive (correlation coefficient of 0.582), as expected. It is more remarkable that the relation between GDP and roads per km$^2$ is negative (correlation coefficient of -0.651), meaning that districts with higher GDP's per capita have less kilometres of roads per square kilometre. A significant relation between length of roads and GDP per capita only exists when a 0.10 significance level is used. Again, the correlation coefficient is negative (correlation coefficient of -0.509). An explanation could be found in the numbers and sizes of the settlements. The data indeed shows that the richer districts have fewer settlements and more inhabitants per settlement. This indicates that fewer roads are needed to connect the settlements with each other. Figure 1 shows the correlation between the variables GDP and modern roads. It is a positive correlation, with two districts that can be considered as outliers.

*Figure 1 - Correlation between GDP per capita and percentage modern roads of total roads*



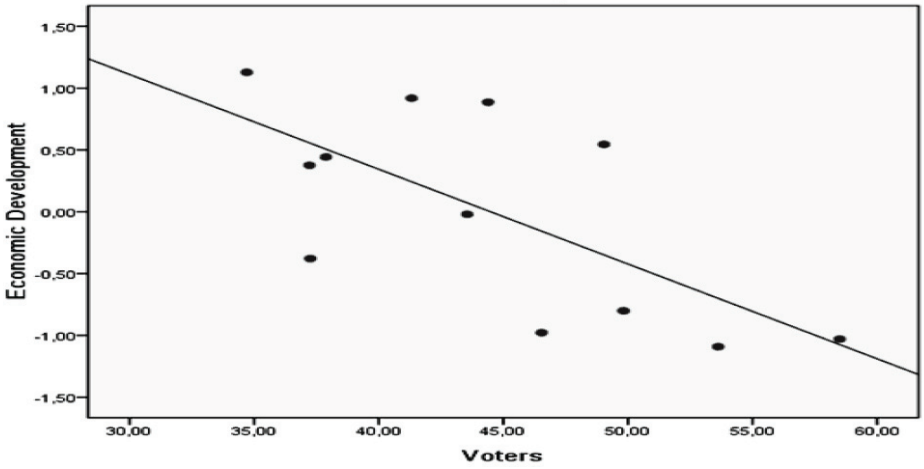

*(Source: SPSS output and RZS, 2009 and 2010)*

The question in this paragraph is whether there is a relation between the election turnouts and the economic development. The answer to this question is yes, but it is not the positive relation which was expected. As social capital is thought to stimulate economic growth, it was expected that economically more well-developed regions would have higher election turnouts. But, between the variables 'voters' with 'GDP' and 'voters' with 'net wages' a significant negative correlation was found (correlation coefficients of -0.581 and -0.710). Also the correlation between voters and the index for economic development is significantly negative. When the GDP in a district is high, the election turnouts are low. With reservation, when substituting election turnouts for social capital, this indicates that higher economic development in Serbian regions is intertwined with lower levels of social capital. Figure 2 below shows this relationship.

An explanation for the negative correlation shown in Figure 3 could be that election turnouts and therefore social capital are higher in smaller communities. Indeed, when looking at the correlation between election turnouts and the average population per locality, this relation is significantly negative (a correlation coefficient of -.635). More people in a community indicate a lower level of election turnouts.

Next, the correlation between the size of the communities and economic development has to be checked. The hypothesis now is that small communities have high levels of social capital (which is already shown) and lower levels of economic development (which has to be proven). New tests show a significant positive correlation (coefficient 0.808) between the level of economic development and the size of the settlements, meaning that larger localities perform better economically. It can therefore be concluded that the negative relationship between economic development and election turnouts can be explained by the size of the settlement: higher election turnouts exist in economically less developed and smaller communities.

*Figure 2 - Correlation between economic development and election turnouts*




*(Source: SPSS output and RZS, 2009 and 2010)*

## Conclusion

The starting point of this research was the assumption that rural infrastructure development in Serbia could be the key to economic growth. To get an overview of the situation concerning the development of rural areas in Serbia, information about the economy, infrastructure and election turnouts was collected. This last variable was used as an indicator for the level of social capital.

According to the literature, both infrastructure development and social capital stimulate economic growth. It was found that the importance of good infrastructure can roughly be divided into benefits for trade, society, investment and employment, for example more investments and lower unemployment. The importance of building social capital lies in the way people interact. If people trust each other and understand the rules and norms under which they interact, they will be stimulated to work together, increase their productivity and reach common goals.

The research compared twelve Serbian districts on the basis of data about the three categories economic performance, infrastructure development and election turnouts. First of all, it was found that a significant correlation exists between the GDP per capita and the amount of modern surfaced roads. But when looking at total kilometres of road, it seems that the economically least developed districts have the most kilometres of road per square kilometre. An explanation can be found in the fact that these districts have more but smaller settlements, therefore more roads are needed to connect these settlements with each other. The quality of these roads is low, especially in the south of Serbia.

A significant correlation does exist between election turnouts and economic development, but it is not the positive relation as expected when reading the literature. It was expected that social capital would stimulate economic growth and therefore richer districts were expected to have higher levels of social capital. But it is found that the poorest districts have the highest level of social capital. An explaining factor is the size of the settlements. It was already discussed that levels of social capital are higher in rural areas than in urban, because social capital is more easily built in smaller communities. In small, rural communities, the levels of bonding social capital are high, with strong family ties and traditional societies. When looking at the research areas, the poorer districts have smaller communities than the richer districts and therefore higher levels of social capital.

The two main findings of this research are that the positive influence of infrastructure on economic development is not convincingly proven for Serbia and that the relation between economic development and social capital (measured by election data) turns out to be negative instead of positive. For further research it would be interesting to look deeper into social capital in rural areas and find more variables for measuring social capital.

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Economics of agriculture
SI – 2
UDK: 663.256.2:614.31

# MONITORING THE STORAGE CONDITIONS OF WINES – EFFICIENT METHOD FOR CONSUMER PROTECTION

*Adrian Stancu[1], Crina Raluca Bucur[2]*

## *Abstract*

*To maintain constant the wine quality during its entire circulation until it meets the consumer, it is necessary that the wine must be preserved in certain conditions of temperature, atmospheric relative humidity and for limited period of time in all the stages of technical-economic circulation.*

*The monitoring of time evolution of wines quality level according to the level of main preservation parameters can identify some correlations in order to avoid selling products with harmful influence on consumer.*

*To emphasize the time evolution of wines quality characteristic levels preserved in standard storage conditions, the authors made a study which had as its main purpose monitoring the evolution of ten quality characteristics of Sauvignon Blanc wine during 60 days period.*

*The research underlined changes with negative influence on quality in all four sensory characteristics and one physicochemical characteristic. These findings made on samples preserved in standard conditions but in the maximum levels of preservation parameters, conclude that the wines quality level is not always constant during the period of validity, although the standard conditions are obeyed.*

*In this context, to ensure the wine consumer protection requires that the producers and competition companies must not only to obey the storage conditions but also to provide actions to improve the adjustment of parameters to wine preservation requirements, so that the initial wines quality level to be maintained or to have slight decreases*.

***Key words****: wine, quality, consumer protection, air temperature, atmospheric relative humidity, preservation period*

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## *Introduction*

The wines periods of validity fluctuate according to its quality. These are between 15 days and 12 mounts, if it obeys the preservation conditions which have as main parameters air temperature 10-15°C and atmospheric relative humidity 75% (Diaconescu, et al., 2007, pp.231).

If the wines are preserved in the conditions mention above, it must maintain its quality level at values closest to original quality level. If the optimal storage conditions are disobeyed, it can generate changes in wine quality, whose trends and intensities are according to the nature of external factor and its intensity and period of influence.

## *Static Quality – Dynamic Quality Relation and the Requirements of Wine Consumer Protection*

To monitor the time evolution of wines quality characteristics a research was conducted on samples of medium dry Sauvignon Blanc white wine which is a DOC superior quality wine with CMD. The sample was obtained by crushing the grapes from Dealu Mare vineyard (Prahova country), 2005 vintage. The product was packaged in 75 cl glass bottles, labeled with "Sauvignon Blanc, 2008" reference (Label of Sauvignon Blanc Wine, 2008).

The study consisted in preserving the wine in a storage chamber. Its parameters were in the maximum limits of normal storage conditions for DOC wines, i.e. the air temperature 15°C, atmospheric relative humidity 75% and preservation period 60 days (Dima, et al., 2006, pp.247). During the research, eight analyses have been carried out (i.e. four physicochemical analyses and four sensory analyses) at 0, 30, 45 and 60 days from the production date.

In the bottle day of wine (0 days) it has been undertaken two analyses (physicochemical and sensory) to obtain the blank test, i.e. the reference in which all the results of further analyses will be set against.

## *Changes in the Physicochemical Characteristics Level of Sauvignon Blanc Wine*

In table 1 is shown the influence of maximum limits of normal storage conditions in physicochemical characteristics level of medium dry Sauvignon Blanc wine. Thus, it can point out that the preservation generates insignificant changes of physicochemical characteristics level.

*Table 1. Influence of maximum limits of normal storage conditions in physicochemical characteristics level of Sauvignon Blanc wine*

| No. | Preservation period (days) | Physicochemical characteristics | | | | | |
|---|---|---|---|---|---|---|---|
| | | Alcohol content (% alcohol by volume) | Reducing sugar (g/l) | Total acidity (g/l tartaric acid) | Volatile acidity (g/l tartaric acid) | Free $SO_2$ (mg/l) | Total $SO_2$ (mg/l) |
| 1. | 0 | 12.0 | 9.74 | 5.73 | 0.15 | 65 | 162 |
| 2. | 30 | 12.0 | 9.74 | 5.73 | 0.15 | 50 | 162 |
| 3. | 45 | 12.0 | 9.74 | 5.73 | 0.15 | 39 | 162 |
| 4. | 60 | 12.0 | 9.74 | 5.73 | 0.15 | 23 | 162 |

*Source: Data from own analysis*

The figures 1-6 show that the level of main physicochemical characteristics remains constant during the preservation period, i.e. *alcohol content, reducing sugar, total acidity, volatile acidity* and *total sulphur dioxide*.

Figure 1. Evolution of Sauvignon Blanc alcohol content preserved at maximum limits of normal storage conditions

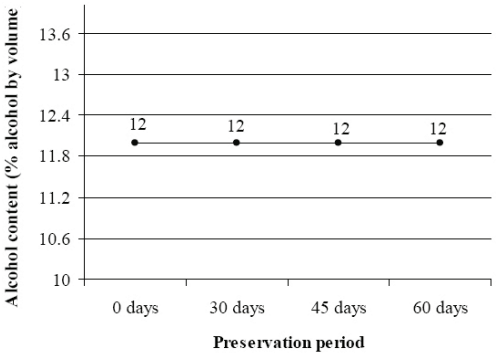



Figure 2. Evolution of Sauvignon Blanc reducing sugar preserved at maximum limits of normal storage conditions

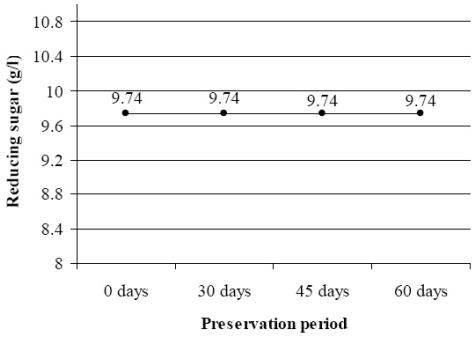



Figure 3. Evolution of Sauvignon Blanc total acidity preserved at maximum limits of normal storage conditions

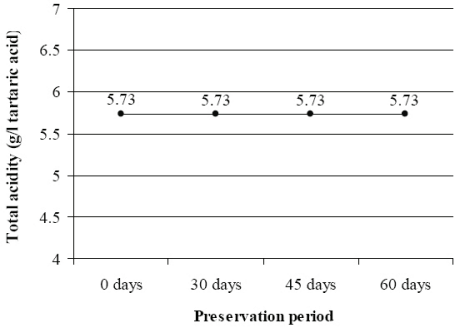



Figure 4. Evolution of Sauvignon Blanc volatile acidity preserved at maximum limits of normal storage conditions

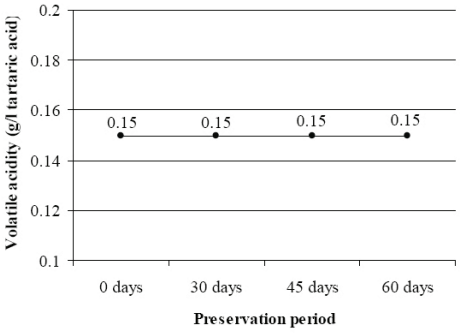



Figure 5. Evolution of Sauvignon Blanc free $SO_2$ preserved at maximum limits of normal storage conditions

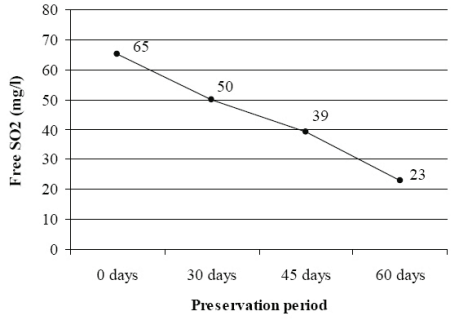
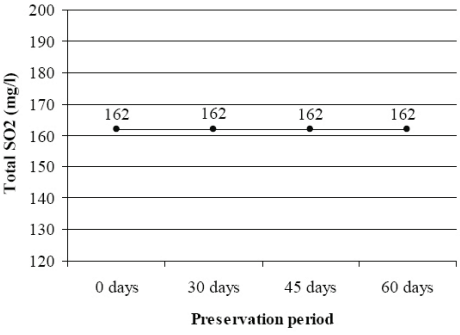



Figure 6. Evolution of Sauvignon Blanc total $SO_2$ preserved at maximum limits of normal storage conditions




*Source: Data from own analysis*

The only physicochemical characteristic that has changed throughout the preservation period was *free sulphur dioxide*. The absolute and relative changes of physicochemical characteristics level of Sauvignon Blanc wine are shown in table 2.

*Table 2. Absolute and relative changes of physicochemical characteristics level of Sauvignon Blanc wine preserved at maximum limits of normal storage conditions*

| Physico-chemical characteristic | Preservation period | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 days | 30 days | | 45 days | | | | 60 days | | | | | |
| | | Change from 0 days | | Change from 0 days | | Change from 30 days | | Change from 0 days | | Change from 30 days | | Change from 45 days | |
| | mg/l | mg/l | % | mg/l | % | mg/l | % | mg/l | % | mg/l | % | mg/l | % |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| Free $SO_2$ | 65 | -15 | -23.08 | -26 | -40.00 | -11 | -22.00 | -42 | -64.62 | -27 | -54.00 | -16 | -41.03 |

*Source: Own calculation based on data from Table 1*

The level of free sulphur dioxide decreased with 23.08% in the 30th day preservation beside the original level; it declined with 40% in the 45th day preservation from the initial level and with 22% beside the 30th day level. Equally, the concentration of free sulphur dioxide decreased with 64.62% in the 60th day preservation from the original level, with 54% beside 30th day level and with 41.03% from the 45th day level.

It can be mention that the decrease of the free sulphur dioxide content in 30th, 45th and 60th day preservation from the original level is higher than the decline registered beside the levels from pervious days.

## *Changes in the Sensory Characteristics Level of Sauvignon Blanc Wine*

Table 3 presents the influence of maximum limits of normal storage conditions in sensory characteristics level of medium dry Sauvignon Blanc wine. Thus, beside the physicochemical characteristics, all sensory characteristics have changed its level, but with different proportion.

*Table 3. Influence of maximum limits of normal storage conditions in sensory characteristics level of Sauvignon Blanc wine*

| No. | Preservation period (days) | Sensory characteristics | | | |
|---|---|---|---|---|---|
| | | Color (points) | Clarity (points) | Bouquet (points) | Taste (points) |
| 1. | 0 | 2.0 | 2.0 | 3.2 | 10.5 |
| 2. | 30 | 2.0 | 2.0 | 3.2 | 10.5 |
| 3. | 45 | 1.7 | 1.8 | 3.0 | 10.0 |
| 4. | 60 | 1.2 | 1.8 | 2.5 | 10.0 |

*Source: Data from own analysis*

The figures 7-10 present the deviation of color, clarity, bouquet and taste level of Sauvignon Blanc wine during the 60 days storage period.

Figure 7. Evolution of Sauvignon Blanc color preserved at maximum limits of normal storage conditions

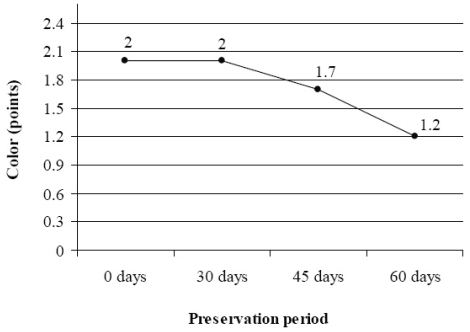



Figure 8. Evolution of Sauvignon Blanc clarity preserved at maximum limits of normal storage conditions

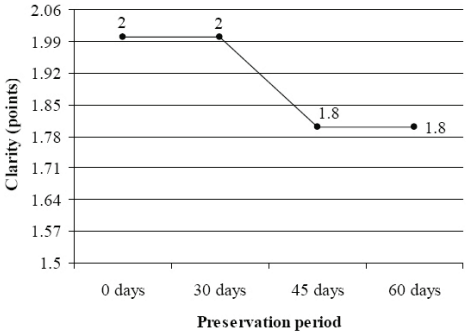



Figure 9. Evolution of Sauvignon Blanc bouquet preserved at maximum limits of normal storage conditions

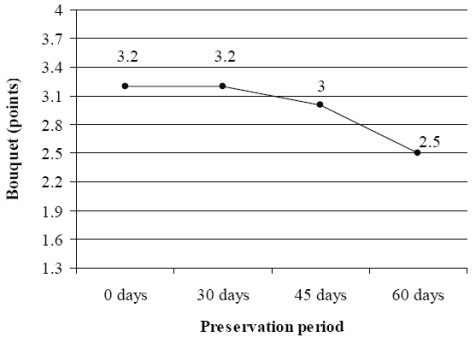
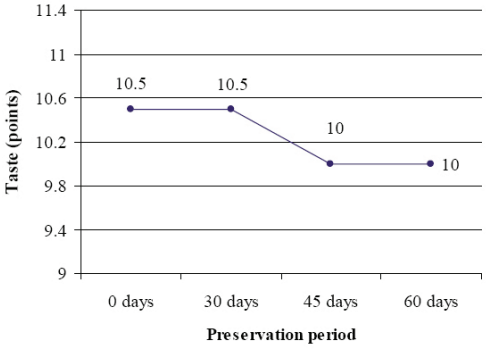



Figure 10. Evolution of Sauvignon Blanc taste preserved at maximum limits of normal storage conditions




*Source: Data from own analysis*

The figures 7-10 show that the sensory characteristics level has changed mainly in the second half of preservation period, i.e. after 45$^{th}$ day preservation.

In table 4 were calculated the absolute and relative changes of sensory characteristics level of medium dry Sauvignon Blanc wine to underline the ampleness of the variations. Thus, the level of wine color remained unchanged in the 30$^{th}$ day preservation; it decreased with 15% in the 45$^{th}$ day preservation from the initial and 30$^{th}$ day levels. It reduced with 40% in the 60$^{th}$ day preservation beside the original and 30$^{th}$ day levels and with 29.41% from 45$^{th}$ day level.

*Table 4. Absolute and relative changes of sensory characteristics level of Sauvignon Blanc wine preserved at maximum limits of normal storage conditions*

| No. | Sensory characte-ristics | Preservation period | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 days | 30 days | | 45 days | | | | 60 days | | | | | |
| | | | Change from 0 days | | Change from 0 days | | Change from 30 days | | Change from 0 days | | Change from 30 days | | Change from 45 days | |
| | | points | points | % | points | % | points | % | points | % | points | % | points | % |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 1. | Color | 2.0 | - | - | -0.3 | -15.00 | -0.3 | -15.00 | -0.8 | -40.00 | -0.8 | -40.00 | -0.5 | -29.41 |
| 2. | Clarity | 2.0 | - | - | -0.2 | -10.00 | -0.2 | -10.00 | -0.2 | -10.00 | -0.2 | -10.00 | - | - |
| 3. | Bouquet | 3.2 | - | - | -0.2 | -6.25 | -0.2 | -6.25 | -0.7 | -21.88 | -0.7 | -21.88 | -0.5 | -16.67 |
| 4. | Taste | 10.5 | - | - | -0.5 | -4.76 | -0.5 | -4.76 | -0.5 | -4.76 | -0.5 | -4.76 | - | - |

*Source: Own calculation based on data from Table 3*

The wine clarity had almost a similar evolution with the wine color, i.e. its level remained constant in the 30$^{th}$ day preservation beside the original level. In the 45$^{th}$ and 60$^{th}$ day preservation, the level of clarity decreased with 10% both from the initial level and from the 30$^{th}$ day level.

The level of wine bouquet remained unchanged in the 30$^{th}$ day preservation, but in the 45$^{th}$ day preservation it declined with 6.25% beside the original and the 30$^{th}$ day levels. In the 60$^{th}$ day preservation, it decreased with 21.88% from the initial and the 30$^{th}$ day levels, and with 16.67% beside the 45$^{th}$ day level.

The wine taste had a comparable evolution with the wine clarity, i.e. in the 30$^{th}$ day preservation its level was constant from initial level, and in the 45$^{th}$ and 60$^{th}$ day preservation it decreased with 4.76% beside the original and 30$^{th}$ day levels.

## Conclusions

As an overall tendency, both the levels of physicochemical characteristics and sensory characteristics had only reduction. In the case of physicochemical characteristics, the most important decrease of free sulphur dioxide was with 64.62% (in the 60$^{th}$ day preservation from the original level) and 41.03% (in the 60$^{th}$ day preservation beside 45$^{th}$ day level).

For sensory characteristics, the most significant decrease was the wine color with 40% (in the 60$^{th}$ day preservation beside the initial level) and 29.41% (in the in the 60$^{th}$ day preservation from the 45$^{th}$ day level).

Regarding the sensory characteristics which registered numerous changes, it can be mentioned the wine color and bouquet, each with two decreases (in the 45$^{th}$ day preservation beside the initial level and in the 60$^{th}$ day preservation beside and 45$^{th}$ day level).

Overall, the Sauvignon Blanc wine preserved at maximum limits of normal storage conditions had three changes of physicochemical characteristics and six changes of sensory characteristics, which means that its quality reduced, ensuring a lower consumer protection. Therefore, the standards should prescribe lower values for the parameters of storage conditions through laboratory studies.

There are two possibilities. The fist one is to reduce the maximum air temperature (i.e. less than 15$^{o}$C) and the maximum atmospheric relative humidity (i.e. less than 75%) and to maintain the maximum preservation period at 60 days. The second option is to retain the maximum air temperature at 15$^{o}$C and the maximum atmospheric relative humidity at 75% and to decrease the maximum preservation period (i.e. less than 60 days). Whichever of the two ways is chosen, it will definitively ensure the consumer protection in the case of medium dry Sauvignon Blanc wine.

There are at least two future possibilities to extend the monitoring of storage conditions of wines in order to ensure the consumer protection by studying either other type of Sauvignon Blanc wine (e.g. dry, medium sweet, sweet etc.) or different white wines (e.g. Chardonnay, Aligoté, Pinot Blanc, Riesling, Pinot Gris etc.).

The results of this study cannot be adapted directly to other types of wines, because each type has its own quality characteristics levels which behave different at the same preservation conditions.

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Economics of agriculture
SI – 2
UDK: 316.334.55:330.341.22 (497.11)

# SPECIFICS OF RURAL AREAS OF SERBIA FROM THE ASPECTS OF REGIONAL DEVELOPMENT[1]

*Marina Todorović[2], Marija Drobnjaković[3], Anja Gligić Simeunović[4]*

## Abstract

*The territory of Republic of Serbia is characterized by considerable socio-economic and demographic disproportions, which are result of inadequate legislations of regional development. Regional differences can be ascribed to the relations: north-south, Belgrade agglomeration – the rest of Serbia, centre-periphery, and specially dichotomy between village and city. The consequence of established regional structure led to the neglect of Serbian village, which is experiencing structural changes in spiritual, psychological and technological sphere. Serbian villages represent a traditional undeveloped area. This paper emphasis problems arising from historical neglect of the Serbian village, which primarily concern the rapid abandonment of agriculture and process of deagrarization, and continuing depopulation and demographic erosion of rural areas*
***Key words**: regional disproportion, rural areas, depopulation, deagrarization*

## Introduction

The regional dimension of some particular area is determined by their socio-economic processes and their modifications, which are always the consequences of

1 The research results, presented here, are part of the Project by the Geographical Institute "Jovan Cvijic" of the Serbian Academy of Sciences and Arts - SANU, titled: "Modalities of Geopotentials Valorization in Undeveloped Regions in Serbia", support by Ministry of science and envaromental protection of the Republic of Serbia

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the change of concrete conditions. They are carried out from the aspect of the space-development relation, in terms of territorialization of the regional development, with large problems and conflicts which are hard to solve. (Derić, Perišić, 1995). Performance of balanced regional development of Serbia disturbing so-called undeveloped / problem areas we face since the seventies of the 20th century. The number of municipalities that have classified into a category of problem areas has been changing over time, covering a wide range of up to 94 different municipalities (Tosic, Lukic, Cirkovic, 2009).

According to the last document, which in certain way treated the problems of the regional development and problematic areas, the draft of the new Spatial Plan of the Republic of Serbia 2010-2014-2021, 36 undeveloped local communities were singled out. During this long period, the most economically, demographically and socially endangered regions are so called traditionally undeveloped areas, which are mostly rural, hilly-mountainous and bordering regions, located in south and south-western part of Serbia.[5] This is an area with deep structural problems that were, in the transitional period, only deepening and now become almost impossible to solve. The problem lies in their "natural fragility, relative isolation and inaccessibility, traditional mono structure of economy", continuing decrease of population and so called "demographical erosion", the occurrence of spontaneously displaced rural settlements and continual increase of poverty of rural population. (Miletić, Todorović, Miljanović, 2009). All of these processes are the consequences of inadequate application of politics of regional development, which resulted in "population and economic super concentration" (the PPRS, 2010), on one hand, and "rural exodus and demographical erosion", on other hand. This dimension of regional development is most obvious between centre-periphery and urban area with the neighbouring area-rural area. Thus, we can say that the main reason of the regional disparities is still unsurpassed rural-urban dichotomy.

## The Problems of Rural Areas in Serbia

Serbia has a long tradition in dealing with the problems of regional development, but the politics related to the rural areas and irregularities of territorial development have not been sufficiently coherent. The place and role of rural development in balanced regional development have long been unjustly neglected in economic theory and practice, and were outside the sphere of interest and consideration of complex issues in the regions and in regional development, which Stosic et al. (2008) see as the previously dominant theory of economic development. The current government in the past promoted to the village is a large Serbian potential, but practically nothing has been done to activate this potential and protection from further devastation. Bogdanov N. (2007) emphasizes that this dimension is marginalized and observed only as an accompanying part of other politics and development programs, which have always observed villages as a problem,

5 Traditionally undeveloped areas, located on south of Serbia, are municipalities of Jablanica, Pčinj and Toplica districts and peripheral, bordering municipalities of Zlatibor and Raška districts.

never as a resource. Such attitude towards rural region of our country contributed to the marginalization of villages, stagnation and decrease of vitality of rural areas, which show "apparent concentration and spatial expressiveness of numerous problems" (Stamenković S., 1999), such as: strong depopulation lasting for decades and unfavourable mono-functional demographic structure, weakly developed and mainly mono-functional economy and infrastructure and superstructure supply which goes from considerably weaker to unfavourable. But, as the aforementioned author states, the problems are also: the decrease and decline of rural residential fund and the objects of rural economy and the decline of the scope and importance of rural economy. The aforementioned problems are practically "the brake of the development of rural settlements, the cause of stagnation in the development or, in certain situations, the consequence of complete extinction of rural settlements" (Stamenković S., Bačević, 1992).

About 85% of the territory of the Republic of Serbia is characterized as rural area; according to the OECD classification (population density is lower than 150 inhabitants /km$^2$). There live about 55% of population of Serbia, and the average population density is 63 inhabitants/ha. According to this definition, 130 rural municipalities can be singled out on the territory of Serbia, or 3904 rural settlements (Bogdanov, 2007). If we observe statistic division on the territory of Serbia, without Kosovo and Matthias, 4715 settlements can be singled out; of which 4527 are rural (The Plan of Strategies for Rural Development, 2009).

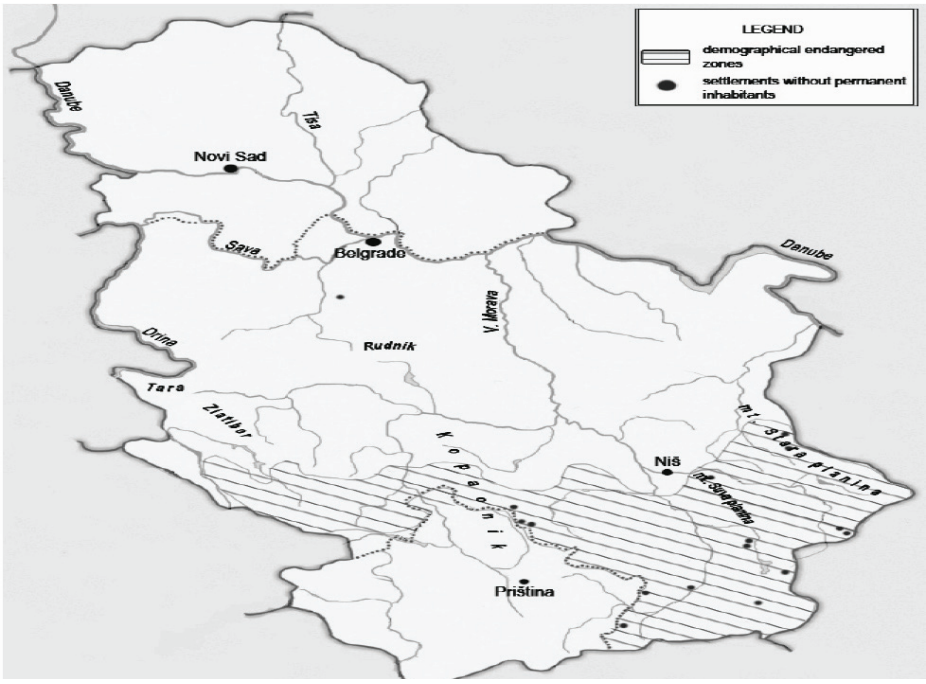
It has already been mentioned that a lot of rural settlements in Serbia, especially hilly-mountainous and those which are distant from local and regional centres, are mostly disposed to depopulation flows. For the last 50 years about 8 million people migrated from the villages, while that trend in the world lasted about 3 times longer. It caused their demographic discharge and fragmentation of a large number of settlements, causing "significant disproportions in the degree of socio-economic underdevelopment and the level of demographic demonstration of settlements in geo-space" (Sтamenković, 2004). Depopulation is the basic demographic feature of numerous rural settlements in Serbia. Rural areas of Serbia received the characteristics of rural exodus even in the sixties of the 20$^{th}$ century, starting from the eastern and south-eastern parts towards other parts of the country. In the period from 1971-1981, 77, 6% of settlements were seized by depopulation, in the following census period even 83 % of settlements. (Todorović, 2007). According to the Census of 2002 - 24, 6% of population lived in the so called middle-sized (with 2000-5000 inhabitants) settlements, or 65% of population lived in the settlements in the category between 500 and 5000 inhabitants. However, the biggest problem in the system of the settlement network of Serbia represent small and undersized settlements (less than 500, or 50 inhabitants), which are basic indicators of demographic risk for some parts of our country. In this group of settlements, with less than 500 inhabitants -7, 8% of population lived in 2002. The estimates are that the lowest number of small settlements are located in eastern, south-eastern and southern Serbia (about 700), which are also characterized as regions with development problems for which is predicted to be on the threshold of complete demographic discharge in the following one or two decades. Big problems particularly represent settlements with small number of inhabitants (less than 40 inhabitants) and extremely unfavourable demographic situation, which were faced

with constant decrease of population, primarily caused by emigration of the young, but also by increasing mortality rate in rural settlements. So, they are on the threshold of "withering away" or demographic "extinction"[6].The trend of fragmentation of settlements will certainly continue in the future period.

The differences have already been noticed from the last conducted Census of 2002- since when the demographic picture of rural settlements of Serbia has considerably worsened. Milivojević. Milošević and Ćalić (2008), using the field research, identified additional 16 "extinct " villages, without any permanent inhabitants, and 19 more which have less than 10 inhabitants mostly older than the age of 60. The aforementioned authors have singled out three most endangered zones of demographic discharge: 1. along the administrative provincial border of Kosovo and Central Serbia; 2. the region of the mountain Stara planina and 3. Vlasina and Krajište (south and south-eastern Serbia).

However, with new researches in south-western part of Serbia, one more potential zone of demographically endangered regions was also identified which is of mountainous character as well. All the aforementioned zones represent regions with special development problems, identified in the PPRS (2010), or so called- traditionally undeveloped regions. This tells us about direct condition of late economic development and demographic discharge.

*Graph. 1 - Demographic affected areas*




6 Numerous authors wrote on the extinction of individual settlements, among them: Stamenković S. (2004): Martinović M. (2004); Martinović M., Šantić D. (2006). Gabrovnica – prilog Velojić V. (2000). Milivojević, M., Ćalić, J., Milošević, M.V. (2007).

The second mentioned, important problems for the economic development of Serbian village are certainly the long-lasting institutional marginalization of agricultural production and the parallel process of deagrarization. The process of deagrarization in Serbia has been very intensive. The number of agricultural inhabitants has decreased to 3 million since 1953, and it culminated in the period of 1971-1981 when 1, 4 million of population left agriculture in only ten years. Almost two thirds of population was employed in the primary sector of activities in 1981 and in 2002 that number dropped to 38%. One of "the fastest exoduses in economic history" was registered here (Todorović M., 2007). The aforementioned socio-economic and political-social flows in our country led to the negative connotation and derogatory use of the term- peasant.

The following statistic data demonstrate, in interesting way, the current state of Serbian villages: every third village in Serbia has less than 200 inhabitants; every fourth village (26, 4%) has inhabitants older than the age of 50; even in 191 (4, 3%) villages there is no inhabitant younger than the age of 20; in last 30 years no baby has been born in 800 villages of Serbia; in the last twenty years 9 villages have disappeared from the territory of Serbia. (Todorović, 2007). There is also one interesting comparison of the deserted houses and emigrated population from the rural areas on the part of Stevanović Đ. (2008), who states that according to the Census of 2002 there were 46814 deserted houses in the villages and 144178 objects which were registered as temporary unsettled, which is about 192000 deserted objects. According to the average size of households- 770000 inhabitants were missing in rural areas.

Recent planning practice and institutional framework of Serbia left villages on the margin of the development, without appropriate instruments and support which would enable more dynamic economic and social development, better communal supply and more qualitative environment. Considering their significance for total and proportional territorial development of the country, it is necessary that reconstruction, improvement and organization of rural areas in a sustainable and socially rational way become one of the basic strategic priorities of Serbia. (PPRS, 2010).

## Conclusion

Village and peasantry in Serbia, depicted in such way, are overburdened with numerous problems which represent the obstacle for the development of the whole country. Hence, emergent and detailed measures need to be taken in order to remove and solve these problems, which "demand organized and pragmatic activity in numerous fields of political, social and economic life." (Stamenković, Martinovć, 2004). Reconstruction of rural society accompanied with the return to villages, demands more attractive, richer, versatile villages which need to be approached integrally from the complex rural development standpoint.

Many scientists have studied the issue of revitalization of rural areas. S. Agarwal, S. Rahman, A. Errington (2009) state that the key for successful economic transformation of rural areas lies in the accessible economic, human, cultural and environmental resources-capitals, which emphasize its multidimensional nature.

Considering this question, Serbia has for a long period lagged behind other countries of the EU and the countries in its close surroundings. Without institutional framework and appropriate strategy which would completely treat the problems of rural areas it was impossible to access certain funds for improvement of rural areas. It was only in the beginning of 2009 that the Ministry of Resources brought the Plan of Strategy for Rural Development for the period of 2009-2013, which has detailed analysis of the current limitations and potentials of Serbian village.

The economic development of rural areas should be based on the model of multifunctional agriculture and the introduction of additional activities, which will be the solution of employment outside agriculture in rural areas. Madureira and Costa (2010) notice that multifunctionality of agriculture has been acknowledged by scientists and politicians as ”a promising approach to address sustainable development within rural areas”. Van der Ploeg et al (2000) also think that the concrete rural development cannot be realized only through “expropriation of agriculture”, but that it is necessary and the most important element in that conglomerate of rural activities. According to the authors, it is possible to realize its competition due to the fact that: agricultural households have access to the resources and they possess needed experience for reconfiguration of the old and opening of new activities; that in this sector is possible to develop new practices step by step, which considerably lessens the risk and enables the process of learning through practice.

As many authors state, alternatives of employment in agriculture, depending on characteristics of area, can be seen in activities connected to the agricultural production (food-processing industry, collecting forest products and healing herbs, production of healthy food and others), tourism (rural, ecotourism, hunting, fishing), recreation, handicrafts, handwork, trade, culture, other service activities and similar. But, it's important to notice that “in many countries partners of the OECD in relation at this character of multifunctionality the agriculture play a role much important for the life of rural regions” (Ciani, 2003)

Ten years long experience shows that transition is a period in which a country must interfere in those segments in which market did not give the expected results. Still, the process of eliminating regional differences is very hard and slow, and demands several-year-long engagement of all levels of government. However, apart from the decentralization and the adequate territorial organization of state on regions, as fields on which all development, institutional, management and financial activities will take place, it is necessary, in solving complex system of problems of undeveloped problematic regions of Serbia, to especially draw attention to detailed solving of the question of Serbian village and elimination of traditionally established dichotomy between village-town and differences conditioned with it. It is necessary to implement the rural population and economic development policy which will be based on appropriate economic, agricultural, demographic, regional and social policy, significantly different from the previous one.

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UDK: 639.31 (498)

# FISHERY PRODUCTS MARKET IN ROMANIA

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## Abstract

*Integrated management policies of water resourses seeks to improve the efficiency, sustainability and equity of water allocations, using a multi-disciplinary approach that recognizes cultural diversity and socioeconomic disparities inside and among societies.*

*Integrated management policies of water resourses will benefit from a sound use of economic and financial instruments that allow decision makers and water users to achieve those goals in a context of democratic decision making. Market liberalization of water resources means that nations and states introduce tradable property rights to water as a means to "increase the productivity of water use, improve operations and maintenance, stimulate private investment and economic growth, reduce water conflicts, rationalize ongoing and future irrigation development, and free up government resources for activities that have a public good content or positive externalities.*

*This study used questionnaires distributed in SE Region in order to obtain information on fish farm activity, access to fish resources, to fishing areas, fish prices and finally on the economic results obtained. A sample of 10 farms was studied, their having an average income being used to diagnose production and marketing activities in the current stage. This study considered the activity of two representative fish farms in SE Development Region.*

***Key words**: fish farms, fishing areas*

### Introduction

The need for this research results from the changes in the fish product market, where there is a trend of change in consumption pattern, from conventional foods to traditional and / or organic, for certain categories of consumers.

Fish production of high value and quality must be encouraged instead of a simple increase in

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production of traditional species. An increase in added value through processing and marketing is an opportunity, as well as diversification to new species (sturgeon, turbot, mollusks etc), but also to tourism and related activities such as fishing lakes.

## Material and Method

It should also be emphasized that the analysis of production structure must be made together with the study of marketing structures, turnover evolution respectively. Thus it can be established whether changes in the structure of sales economically favored the fish farm. The diagnosis of fish farming activity in the sample went through the following steps:

- ✓ identification of issues to be analyzed;
- ✓ determination of the necessary information system;
- ✓ analysis and presentation of results into a report which reflects the objective conditions, findings, recommendations.
- ✓ argument and a set of management measures geared towards improving fish farming activity analyzed.

The evolution of turnover shall be based on known statistical models. The veracity of the conclusions is given by the accuracy of the information used and the time period considered, in our case such period shall be at least three years of activity. Time analysis of turnover is more suggestive when done on the basis of comparison with indicators of business effort (number of personnel, fixed assets, of working time).

## Results and Discussions

Changes in production structure of fisheries during the three years has influenced the average delivery price and, ultimately, the turnover of the holding.
Thus, in 2006 fresh fish represented 60% of the total quantity of fish delivered, in 2007 the product reached about 56% and in 2008 the share of fresh fish delivered was only 45.5% of the total production of fish delivered. This change in structure has helped to increase overall turnover resulting from the fish market, which consisted in 2008 in the turnover from the sales of fresh fish (43.7%), and frozen fish (56.3%).

*Table 1 - Production (QM), selling price per unit of product (PK) and turnover (CA) of the Tulcea farm*

| Fish species | 2006 | | | 2007 | | | 2008 | | |
|---|---|---|---|---|---|---|---|---|---|
| | tons | lei/kg | thou lei | tons | lei/kg | thou lei | tons | lei/kg | thou lei |
| **1. Fresh fish** | | | | | | | | | |
| Carp 1-2 kg | 25 | 5.0 | 125.0 | 16 | 5.5 | 88 | 5 | 6.0 | 30.0 |
| Carp 2-10kg | 20 | 7.5 | 150.0 | 25 | 8.0 | 200 | 25 | 8.5 | 212.5 |
| Sanger 2-10kg | 25 | 3.5 | 87.5 | 40 | 3.8 | 152 | 30 | 5.0 | 150.0 |
| Novac 2-10kg | 5 | 3.5 | 17.5 | 15 | 3.8 | 57 | 5 | 4.5 | 22.5 |
| Pike | 2 | 7.0 | 14.0 | 1 | 7.0 | 7 | 1.5 | 7.5 | 11.25 |
| Sheat fish | 1 | 9.0 | 9.0 | 1 | 9.0 | 9 | 1.2 | 9.5 | 11.4 |
| Crucian | 8 | 2.8 | 22.4 | 10 | 3.0 | 30 | 12 | 3.5 | 42.0 |
| Total | 86 | X | 425.4 | 108 | X | 543 | 79.7 | X | 479.65 |
| **2. Frozen fish** | | | | | | | | | |
| Carp 1-2 kg | 20 | 5.5 | 110.0 | 20 | 5.7 | 114 | 15 | 6.5 | 97.5 |
| Carp 2-10kg | 0 | 7.7 | 0 | 5 | 8.5 | 42.5 | 25 | 9.0 | 225.0 |
| Sanger 2-10kg | 25 | 3.7 | 92.5 | 35 | 4.0 | 140.0 | 30 | 5.5 | 165.0 |
| Novac 2-10kg | 10 | 3.7 | 37.0 | 20 | 4.0 | 80.0 | 20 | 5.0 | 100.0 |
| Pike | 0 | 0 | 0 | 0 | 0 | 0 | 1.5 | 8.0 | 12.0 |
| Sheat fish | 0 | 0 | 0 | 1 | 9.5 | 9.5 | 0.8 | 9.8 | 7.84 |
| Crucian | 2 | 3 | 6.0 | 5 | 3.5 | 17.5 | 3 | 3.7 | 11.1 |
| Total | 57 | X | 245.5 | 86 | X | 403.5 | 95.3 | X | 618.44 |
| Total goods | 143 | X | 670.9 | 194 | X | 946.5 | 175 | X | 1098.09 |
| **3. By products** | | | | | | | | | |
| Summer carp II | 18 | 5.5 | 99.0 | 10 | 5.7 | 57 | 25 | 6.0 | 150 |
| Summer sanger II | 25 | 4.0 | 100.0 | 15 | 4.1 | 61.5 | 30 | 4.3 | 129 |
| Summer Novac II | 17 | 4.0 | 68.0 | 15 | 4.1 | 61.5 | 20 | 4.3 | 86 |
| Total | 60 | X | 267 | 40 | X | 180 | 75 | X | 365 |

*Source: own calculations based on case studies*

Of course, such a situation was also caused by the average selling price per unit of product. In frozen fish, the price was higher than that of fresh fish. For instance, while the average selling price per unit of product for fresh fish ranged from 5.02 euro / kg in 2007 to 6.02 euro / kg in 2008, the price of frozen fish was 4.69 Euro / kg in 2007 and 6.49 lei / kg in 2008.

Moreover, changing the structure of production in 2008 calls into question the possibility of consolidation and expansion of freezing activity involving space and adequate facilities, both consuming much energy and other specific inputs. Such a situation may create problems in terms of product profitability, as long as the top level of sales price per unit of product (compared with fresh fish) is not higher for fresh fish to frozen fish.

As for the factorial analysis carried out, several significant conclusions can be drawn, namely:

1. variation in turnover is due to the influence of two factors with direct action: the quantity of product delivered fresh and average selling price per unit of product.
2. variation in turnover is due to the influence of two factors with direct action: the

structure of commodity production and the selling price per unit of product.

*Table 2 - Commodity output by product category and turnover expressed in unit production costs and average sale prices to farm in Tulcea County*

| Item | Symbol | Years | | % |
|---|---|---|---|---|
| | | 2007 | 2008 | |
| CARP | | | | |
| Commodity output (t) | Qm | 66000 | 70000 | 106 |
| Turnover expressed in costs (thou lei) | ΣQm*c | 365772 | 643300 | 176 |
| Turnover expressed in prices (thou lei) | ΣQm*p | 448800 | 560000 | 125 |
| SANGER | | | | |
| Commodity output (t) | Qm | 75000 | 60000 | 80 |
| Turnover expressed in costs (thou lei) | ΣQm*c | 262500 | 355200 | 135 |
| Turnover expressed in prices (thou lei) | ΣQm*p | 285000 | 300000 | 105 |
| NOVAC | | | | |
| Commodity output (t) | Qm | 35000 | 25000 | 71 |
| Turnover expressed in costs (thou lei) | ΣQm*c | 122500 | 148000 | 121 |
| Turnover expressed in prices (thou lei) | ΣQm*p | 133000 | 120000 | 90 |
| PIKE | | | | |
| Commodity output (t) | Qm | 1000 | 3000 | 300 |
| Turnover expressed in costs (thou lei) | ΣQm*c | 2700 | 10950 | 406 |
| Turnover expressed in prices (thou lei) | ΣQm*p | 7000 | 22500 | 321 |
| SHEAT FISH | | | | |
| Commodity output (t) | Qm | 2000 | 2000 | 100 |
| Turnover expressed in costs (thou lei) | ΣQm*c | 5400 | 7300 | 135 |
| Turnover expressed in prices (thou lei) | ΣQm*p | 18000 | 19400 | 108 |
| CRUCIAN | | | | |
| Commodity output (t) | Qm | 15000 | 15000 | 100 |
| Turnover expressed in costs (thou lei) | ΣQm*c | 40500 | 54750 | 135 |
| Turnover expressed in prices (thou lei) | ΣQm*p | 45000 | 55500 | 123 |

*Source: own calculations based on case studies*

## Conclusions

Analyzing factorial influences, according to previous determinations, we note the following:

1. Commodity stocks lower production by 10% in 2008 over 2007 had the effect of reducing profits with 789.428 lei. As demand for such products continues to grow, this situation is not beneficial for economic and financial position of the company. Such a situation may be caused by internal factors or external factors of the company.
2. Changes in fish selling prices, increasing by 27.5% of them in 2008 compared with 2007, resulted in an increase in total profits of the enterprise with 28,518.363 lei. The change in prices was caused by high demand and low supply, but also by the

increased share of the fish products with higher market prices.

3. Both the commodity output and sale prices per unit have contributed as turnover to an increased overall profit of the company by 20,625.936 lei.
4. Commodity output structure, as a factor to influence indirectly, contributed to higher profit of fish farms with 17,112.021 lei. This means that compared with 2007, in 2008 the structure of production has improved in terms of species that bring high returns with less expenditure. The extension of such fish species, and increasing supply will improve the financial situation of the company.
5. Selling prices were higher than the previous year in most fish products, their effect is increased profits with 162,794.063 lei. This may be due to the company effort to improve production structure and quality, as well as of temporary external factors.
6. Unit production costs have exerted a negative influence on profit farms in the amount of 480,060.027 lei. The situation was caused by cost overruns in fish species that have a majority share in total sales. Influence of change in unit costs can be explained according to components (material expenses, personnel expenses, liquidation, other charges, bank interest expense, taxes or fees) and their specific factors (specific consumption of material, labor productivity, supply prices, etc.). Increased costs should not be seen as an adverse action. It is justified only when the additional consumption of resources is reflected in improved product quality and increased selling prices, the effect obtained is greater than the effort.
7. Influences the structure of commodity output (17,112.021 million), the average selling price (162,794.063 million) and cost per unit of product (-480060.027 billion) contributed to decrease farm income with 300,153.943 lei.
8. In conclusion the factors that negatively influenced the change in income have a decisive role in relation to factors that favored greater profits, fish farm activities in 2008 ending with a loss of about 354,000 lei.

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Economics of agriculture
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UDK: 311.312:316.334.55

# 2011 AGRICULTURAL CENSUS IN SERBIA – STRATEGIC TOOL FOR BOOSTING RURAL DEVELOPMENT PROGRAMS

*Crina Turtoi[1], Dragana Marković[2], Camelia Gavrilescu[3]*

## Abstract

*The elaboration of strategic programs for the development of rural areas requires rigorous and comprehensive analysis accompanied by an increased demand for data, as an inherent support for this work. The objective of this paper is to bring into the attention of the academic community the particularities and the main concerns regarding the implementation of the 2011 Agricultural Census in the Republic of Serbia, as an answer to the endeavors for satisfying the data demands of the bodies involved in the use of agricultural statistics for analyzing the emerging issues in agriculture, especially those concerning environment and rural development. On the road of accession to European Union the role of agricultural statistics in the frame of the European Statistical System is a prerequisite for comparable information, indispensable to the implementation of the Common Agricultural Policy. Main methodological and organizational aspects regarding the next agricultural census are the main topics of this paper.*
***Key words:*** *Rural Development, Harmonized Statistical System, Agricultural Census, methodological principles, indicators.*

## Introduction

The present European agricultural statistics system has developed as the common market organizations were implemented. These statistics acted both as a support to the rise of the common market organizations, but also as a support on the ongoing

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implementation of the common agricultural policy. Agricultural census is an essential tool for providing data needed to develop an effective strategy for the sustainable development of rural areas and of the agri-food sector. Serbia officially applied for the EU membership on 22 December 2009. The government of Serbia has the goal for the EU accession in 2014. Upon accession to the EU, each of the new member states is required to apply the *acquis communautaire*, or body of EU law, to its own national body of laws. This is why preparation for the enlargement involves intensive accession negotiations on a whole series of policies presented in the so-called ***chapters***. Statistics itself is a *chapter* for negotiation. Carrying out an agricultural census is part of the calendar of actions needed on the road of accession to EU for concluding the negotiations on *Statistics Chapter*. The key challenges for statisticians in the enlargement process are the provision of data to support the negotiation process and the integration of the statistical information provided by the National Statistical Offices into the European Statistical System. For comparability reasons, at developing the *census methodology* must be considered the need for harmonization of the national statistical system with EU and international requirements and standards. The EU requirements in the statistical field, considered as a starting point for tomorrow's needs, form a comprehensive and harmonised body which fits also into the requirements of the world statistical system (FAO, OECD, UNECE, etc). The data used in the accession negotiations are based as much as possible on the European Statistical System provisions.

## Goals and objectives of an agriculture census

Agricultural census is one of the core activities in the agricultural statistical system of a country. A census of agriculture provides an accurate image of the agricultural activity and farming system of the country at a particular point in time, with a single reference date for the information. The last Agricultural Census was conducted in the Republic of Serbia in 1960. Basic data on agricultural family farm holdings were collected through the Population Censuses in 1971, 1981, 1991 and 2002. The **main goals** of the 2011 agricultural census are to provide relevant statistical information both for the development of the *national agricultural policy*, but also for *conducting the negotiations for the accession* of the Republic of Serbia to European Union. Integration in European structures imposes, as an essential condition for participation in the common agricultural policies, the existence of accurate and reliable information on the structures of agriculture of the member states.

The **main objectives** of the 2011 Agricultural Census are:

- To obtain a comprehensive list of all known agricultural holdings, as a database for conducting the current statistical sample surveys during the year.
- To supplement and update all statistical data and information on agriculture with regard to structural characteristics of the holdings.
- To provide reliable statistical information at territorial level and to picture the changes in the structure of agriculture, as a result of the privatization process (number, types and sizes of holdings).

- To provide information for commodities where level of production is limited.
- To provide data and information needed for setting up the Statistical Register of the Agricultural Holdings[4].

***Achieving these objectives will help the statistical institute:***

- To provide information to decision makers with regard to the real potential of the agricultural sector, under a high regional breakdown.
- To ensure harmonized indicators needed for comparisons with other countries, by taking into account the FAO recommendations and EU regulation on carrying out an agricultural census[5].
- To adopt correct decisions and the best approach during the integration process.

## Farm structure surveys carried out in the EU – backbone of the European agricultural statistical system

For assessing the situation of agriculture and for monitoring the trends in agricultural structures, two types of *Farm Structure Surveys* are carried out, on a harmonized base, by all EU Member States:

a) One **basic survey** conducted at every **10 years** as an **exhaustive** full scope *Agricultural Census*;

b) Several **sample based** *Farm Structure Surveys***.** conducted every **3 years** in the period in-between two agricultural censuses; these surveys are carried out following the same methodological principles of an agricultural census, thus ensuring comparability with census data series.

   If an agricultural census is generally carried out on *exhaustive* principles, farms structure surveys are carried out on a *representative sample of agricultural holdings* drawn out from the census database, regularly updated by the help of current statistical surveys

Farm structure statistics play a key role in the design, implementation, monitoring and evaluation **of the Common Agricultural Policy.** This is why, for comparability reasons, it is imperative that the methodological principles of the Farm Structure Surveys, compulsory to be regularly carried out in all EU Member States, to be fully harmonized.

4 The Statistical Register of the Agricultural Holdings will be the main sampling frame for conducting regular surveys in agriculture.

5 FAO recommend in the guidelines for 2010 World Round of Agricultural Censuses that a census should be undertaken between 2005 and 2015. In the frame of FAO recommendations, European Union defines 2010 as being the year for carrying out the census of agriculture in all Member States.

## Census particularities

The census can provide information that cannot be regularly supplied by administrative data or sample surveys. Information is to be collected from all agricultural holdings, regardless of size or geographic location. Enumerators have to interview or leave a census of agriculture questionnaire at every agricultural holding or every farm operator. The strengths of a census lie in the collection of data from all members of the statistical population, providing very valuable information useful for historical comparisons. The census limitations reside in its significant high cost and the logistics associated with the need for considerable human and financial resources for a relatively short period of time. Having in view the large number of agricultural holdings, complete enumeration is an expensive and time-consuming operation. A large number of people and resources need to be organised and mobilised to collect and process a large volume of information in a short period of time. Even if theoretically there are no sampling errors associated with a census, the errors of concern may include errors in the frame, in establishing precise methodological definitions, in misinterpretation of the questions by respondents, in inconsistencies in field collection procedures or mistakes coming from data processing. Due to his high costs, an agriculture census is not a practical means for providing annual or seasonal agricultural data on crop or livestock production. **The census will provide only structural information on agricultural holdings but not data on production.** After the census, data on crop and livestock production will be obtained by the help of the surveys conducted regularly on the **representatives samples** selected form the census database, which will enable the statistical institute to provide accurate results in a timely manner. The large quantity of data that will be collected during the agricultural census request an extended time for their processing and analysis and, consequently, succeeding the data collection period, it is needed more then one year for being released. Preliminary data on a restricted number of indicators will be released immediately after the census.

## Methodological principles

The agricultural census is the main source of homogeneous information for providing comparable and comprehensive agricultural data at territorial level. Its results will accurate reflect the agricultural situation at the level of the country. For using the census data, one must understand the concepts and definitions underlying the information, but also what the data intent to measure. At developing the census tools it was undertaken an extended work of documentation through the international standards and recommendations on the concepts, definitions and classifications. As well, national requirements and particularities were taken into consideration for insuring the comparability of historical data series. Concordances between concepts, definitions and classifications produced by Eurostat and FAO with the national standards were insured. The data of general interest collected during the agricultural census will provide

accurate information on the size and structure of the agricultural holdings, according to their main characteristics.

**The Census Questionnaire** and **the Enumerator's Handbook** are the main methodological tools when conducting the census. The design of a good *questionnaire* plays a central role in the data collection process. The questionnaire has a major impact on data quality, respondent burden, interviewer performance and respondent relations. Good questionnaires can both minimise respondent burden and collect the required information with a minimum of errors. It requires a lot of work and careful testing to achieve the final version of a questionnaire. Efforts are done to operate with words and concepts that have the same meanings for both respondents and statisticians. Questionnaires also need to be designed to be attractive and easy to complete. Questionnaires are always pretested with an informal test that helps identify the most obvious problems such as poor wording, ordering of questions, layout or instructions. Finally, a pilot test is always conducted following the pretest to observe how all the census operations work together. The *census questionnaire* contains questions that will need careful attention from the part of the interviewed person, in order to be provided, as much as accurate, the entire information that makes the object of the census program: legal status of the holding; identification of the holding; destination of the agricultural products obtained in the holding; total area of the holding; utilization of agricultural area of the holding; application of irrigations and fertilizers on the holding; livestock herds raised on the holding; labour force involved in the agricultural activities developed on the holding; agricultural machinery and equipment utilized on the holding; agricultural buildings in use on the holding; other information on the activities carried out on the holding; etc. The *Enumerator's handbook* provides detailed information on the census methods, on the interviewing techniques, on the modality of filling in the information in the Questionnaire and into the centralization forms, as well as on the modality to solve up certain problems that may appear, most frequently, during census running. To the most possible extent, concepts and wording utilized for describing the characteristics are to be harmonized with those foreseen in the documentation studied. This will allow the comparability of data both at national and at international level.

## Field data collection

The impact of data collection actions on data quality is critical, as *field data collected* are the primary input to the final estimates. Complex statistical procedures proved to be of little help in correcting the effects of faulty collection operations. Interviewers are an essential element of the collection operation so it is critical that the interviewers are given the appropriate training and tools to ensure success. On the road of preparing the agricultural census there will be done all efforts to set up a comprehensive coverage of the agricultural holdings, but also to a carefull planning for efficient and effective data collection operations. This is envisaging operations like: testing the census tools, interviewers training and quality control. Questionnaires and Enumerator's manuals editing, field data collection, coding and data entry are some of the complex activities done by census employees and the use of quality control

procedures are particularly useful in providing feedback reports of information on frequencies of and causes of error for the census manager, operations employees and statisticians.

## Statistical unit of observation at agricultural census

The statistical unit of observation at agricultural census is the **agricultural holding**, defined as a single unit, both *technically* and *economically,* that during the reference period has as its main or secondary activity agriculture, answering simultaneously to the following three criteria, regardless of type of property or location of land and animals:

1. **Carries out a production activity from which agricultural products are obtained** *(the **list of activities** referred to in the definition of agricultural holding is based on the European Statistical Classification of Economic Activities (NACE Rev.2)*[6] *for crop and animal production, hunting and related service activities with some exceptions specified in additional notes in the Annex I to the European Parliament and Council Regulation (EC) No 1166/2008. In particular, holdings exclusively maintaining agricultural land in good agricultural and environmental condition are included in the scope of the census).*
2. **Have certain size according to EU and national requirements** (*a minimal threshold may be applied according to specific national decision - e.g: more than 0.5 ha; farms under the threshold are included if reporting an intensive agricultural production)*,
3. **Has a unique management** *(managed as a single unit and using the same production means: labor force, agricultural equipments and buildings, storage capacity, etc).*

**The unique current management** can be exercised by a person or family farm, by an association consisting of two or several persons or households, acting jointly, or by a legal entity (agricultural association, commercial company, public administration unit, cooperative unit or other organization forms). The total land area of the agricultural holding may comprise one or several parcels, located in one of several areas of the locality, or in one or several administrative-territorial divisions, on which are utilized the same production means, while the holding is *managed on a joint basis*: labor force, agricultural buildings, agricultural machinery and equipment or draught animals (working animals). The requirement to manage on a joint basis the same production means, used on the holding, represents a compulsory condition, so

6 Regulation (EC) No 1893/2006 of the European Parliament and of the Council of 20 December 2006 establishing the statistical classification of economic activities NACE Revision 2 (OJ L 393, 30. 12. 2006, p.1) and amending Council Regulation (EEC) No 3037/90 of 9 October 1990 on the statistical classification of economic activities in the European Community (OJ L 293, 24.10.1990, p. 11–26) as well as certain EC Regulations on specific statistical domains.

that the parcels of the holding could be considered as part of the same economic unit. **By unique management of the agricultural holding** it is meant the current adoption of decisions on the works that are carried out on the holding and on the operations with no major economic effect upon the activity of the holding, such as: date of planting, of harvesting, of phyto-sanitary treatment application, of crop irrigation, the sale of a culled animal, etc. This management is ensured by only one person or by a group of persons. On the family farm, the chief of the farm is the farm head or another adult member of the respective farm.

## Census frame

Whether conducting a sample survey or a census, a core component of methodology is the sampling frame. The frame usually consists of a listing of observation units, but alternatively it might be a structure from which clusters of units can be delineated. For agricultural censuses, the frame is likely to be a Farm Register. In the absence of a farm register, at the elaboration of the List of the Units of observation particular attention must be paid to: (i) accurate identification among the agricultural households which are the ones that can be defined as agricultural holdings; (ii) accurate and updated coverage of all legal units developing agricultural activities.

## Census funding

Due to the lack of enough financial resources, agricultural censuses are often conducted with less than the optimum level of funding**.** *Insufficient funding* can impact on the methodology of the census of agriculture which has to be adjusted to adapt to the level of funding available. This will be reflected, on one side, into a reduction in the scope and coverage of the data collected and, on the other side, if sampling is used, in a reduction in the geographic detail available and the range of items. *External funding* may be an option but, while there are increasing demands for such funds for other government activities, often agriculture and statistics do not always feature as high priorities.

## Conclusions and observations

The census results will play a very important part in the **decision making process** for both ***private*** and ***public*** decision makers, enabling them to adopt **knowledgeable decisions** with regard to the future of their operations in the agribusiness and farming sector, but also in the **formulation of strategic programs for the development of rural areas,** as well as for monitoring, evaluation, and forecasting the agricultural sector.

Even if farmers are required by law to respond to the Census of Agriculture, it may be encountered a certain degree of non-response rate. For diminishing eventual bias in the final estimates, it is important to make all efforts to decrease the non-response rate by ensuring an accurate coverage of the census and by providing a proficient training to the enumerators. Selection of skilful enumerators represents one of the core activities in the census planning, with a high impact on the quality of the final results.

The sound statistical practices obtained by conducting regular surveys in agriculture represent a valuable experience for the Statistical Office of the Republic of Serbia, applicable to the forthcoming census activities.

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Economics of agriculture
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UDK: 330.59:631.111.3 (438)

# THE CLASSIFICATION OF RURAL HOUSEHOLDS IN POLAND BY THE LIVING STANDARDS

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## Abstract

*In addition to income, the equipment of households with durable goods represents a significant indicator of living standards and the quality of life in the population in question. The paper concerns the equipment of rural households with selected durable goods. Based on the possession of durable goods specified in survey, it was possible to distinguish certain types of the surveyed rural households. Analyses of the findings from the survey have shown both improved equipment of rural households with durable goods and a marked advantage of farming families over the landless rural population in this respect. Considering the above-mentioned indicators of equipment with durable goods and changes in this respect, it can be concluded that aspirations of the surveyed rural families reflect changing consumption patterns towards higher-order values. The analysis was mostly based on the survey of families residing in 76 villages across Poland, conducted by the IAFE-NRI .*
***Key words****: rural households, living standards, durable goods*

## Introduction

In addition to income, the equipment of households with durable goods represents a significant indicator of living standards and the quality of life in the population in question. Their type and age, technical parameters and depreciation depend on a number of variables, both economic (income, prices) and non-economic factors (the number and age of family members, the number of children etc.).

Durable goods are consumer products characterised by a long service life. A product's lifetime depends on the need it is intended to satisfy and normal wear and tear. Equipment with such goods can also indicate household consumption. Therefore, equipment with durable goods can be seen as one measure of living standards and the quality of life, which in turn can be evaluated on the basis of owned durable goods and

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purchase plans. The purchase of household appliances is usually driven by diversified supply, the wish to have additional equipment, the intention to hedge against increasing prices or reduced income.

Due to technical and technological innovations, the equipment of households with durable goods is subject to continuous changes. As a rule, the improved quality of new products available in the market encourages consumers to replace previous appliances and devices. In recent years, products once indicating higher economic status have become common goods for nearly all households. Such goods include colour televisions, washing machines and refrigerators. In the past five years, the lists of durable goods published in statistical sources have also been extended to cover new products such as personal computers, microwave ovens, dishwashers and equipment for the reception of satellite television, once unavailable to consumers on account of insufficient income or limited market supply.

Increasing the well-being of individuals, improving the distribution of wealth in society are seen as the most important objectives to be achieved in socio-economic development. Therefore, the assumption is that studies of the equipment of rural households with durable goods have a significant information value and, indirectly, represent a basis for evaluating the ongoing socio-economic changes in Poland.

This paper is prepared as part of an analysis of the continuing disparities between rural and urban areas in terms of civilisation advancement since the development of the whole rural population or specific groups hardly corresponds to living conditions in towns and cities and fails to meet the needs of rural communities.

The analysis was mostly based on the survey conducted by the IAFE-NRI in 2005. The 2005 survey included 8,604 rural households, of which 4,899 represented households with agricultural land and 3,705 were landless families. The surveyed households were located in 76 villages across Poland.

The paper is aimed to evaluate rural households in the surveyed Polish villages, categorised as farming or landless families, in terms of the level of and differences in the equipment with durable goods. Such a comparison will allow identifying similarities and disparities as well as likely changes in the equipment of rural households which can be anticipated in the future. Moreover, basing on the information concerning the possession of durable goods specified in survey, the certain types of rural households were distinguished.

## Categories of owned devices and households broken down by equipment with selected durable goods

The conducted survey only allows determining the number of equipment units, it fails to answer the question about the quality which is another important characteristic of living standards. Nevertheless, the date of purchase (before 2000 and in 2000-2005) may indicate, on the one hand, the wear and tear of owned devices and appliances, but on the other hand it shows that such products have been popular and accessible to the rural population for years. It primarily concerns modern durable goods such as automatic washing machines, microwave ovens and dishwashers.

*Table 1. Durable goods in the surveyed households*

| Product category | Households | | |
|---|---|---|---|
| | Total | Farming | Landless |
| **Common** | refrigerator, television set, gas or electric cooker | refrigerator, television set, gas or electric cooker | refrigerator, television set, gas or electric cooker |
| **Standard** | vacuum cleaner, radio cassette recorder, wired telephone, automatic washing machine, passenger car, deep freezer | vacuum cleaner, radio cassette recorder, wired telephone, automatic washing machine, passenger car, deep freezer, mobile phone | vacuum cleaner, radio cassette recorder, wired telephone, automatic washing, machine |
| **Higher standard** | mobile phone, video cassette recorder, equipment for the reception of satellite or cable television, personal computer, food processor, microwave oven | video cassette recorder, equipment for the reception of satellite or cable television, personal computer, food processor, microwave oven | passenger car, mobile phone, video cassette recorder equipment for the reception of satellite or cable television, personal computer, food processor, microwave oven |
| **Luxury** | second car, video camera, dishwasher, motorcycle, electric press | second car, video camera, dishwasher, motorcycle, electric press | second car, video camera, dishwasher, motorcycle, electric press |

*Source: 2005 survey by IAFE-NRI.*

Durable goods owned by households can be divided into four categories [1]:

- **common goods,** basically accessible to every household if necessary (and owned by over 90% of the surveyed households);
- **standard goods** found in more than half of the surveyed group;
- **higher standard goods**, possessed by 10-50% of the households;
- **luxury goods**, observed in fewer than 10% of the surveyed households.

In the group of rural households surveyed in 2005 the set of commonly available goods included a refrigerator, a television set and a gas or electric cooker (Table 1).Standard goods comprised a vacuum cleaner, a radio cassette recorder, a wired telephone, an automatic washing machine, a passenger car and a deep freezer. According to the figures presented in the table above, appliances considered to be standard goods significantly varied in rural areas. Farming families owned many more devices and appliances than households of landless families. The group of higher standard goods included a mobile phone, a video cassette recorder, equipment for the reception of satellite (or cable) television, a personal computer, food processor and a microwave oven.

Based on the assumptions discussed above, products regarded as luxury goods comprised the following: another (second) car in the family, a video camera, a dishwasher, a motorcycle and an electric press.

However, it should be noted that the classification of certain durable goods under specific categories results not only from their standard or the financial standing of households, but also from the composition of the analysed product groups. The possession of good hi-fi equipment or a radio cassette recorder makes CD or cassette

players redundant. The group of higher standard goods should also include an electric washing machine and spin-dryer, but considering the fact that an automatic washing machine represents a substitute good they can hardly be regarded as higher standard goods. Furthermore, it is open to question whether a sewing machine should be classified under this group as the possession of such equipment is not always a clear indication of a higher (i.e. better) level of household equipment.

The above breakdown suggests that in rural areas farming families owned relatively better equipment than landless families, particularly with regard to devices and appliances defined as standard and higher standard goods, which is also reflected in previous observations concerning the equipment of the surveyed households with certain groups of durable goods.

## Selected types of rural households

Based on the possession of durable goods specified in survey, it was possible to distinguish certain types of the surveyed rural households.

The number of owned goods reflects the degree of modernity of the household. It represents a ladder in which the lowest step is the situation where the household has no devices or appliances listed in the questionnaire. The survey revealed a high level of equipment with durable goods, which allowed determining the relative wealth of the surveyed households.

According to the conducted survey (Table 2), in 2005 all the devices defined as common goods (i.e. a refrigerator, a television set and a gas or electric cooker) were owned by 89.3% of rural households (91.4% of farming families and 87.6% of landless households). Nearly two-thirds of rural families had such equipment plus an automatic washing machine. A similar number of households owned a refrigerator, a television set, a washing machine and a vacuum cleaner at the same time. Devices and appliances which can be described as "once luxury goods" (i.e. a video cassette recorder, an automatic washing machine, a wired telephone, a television set) were found in almost one-third of rural families. Nearly every tenth family used a refrigerator, a microwave oven, a food processor and a washing machine. In significantly fewer households (a total of 2.2%) the kitchen was equipped with all the modern devices and appliances: a refrigerator, a dishwasher, a microwave oven and a food processor.

A similar number of the surveyed rural families owned modern equipment enabling wider contact with the world and popular leisure activities. Such devices included a satellite dish, a personal computer, a mobile phone and a video camera.

The group of higher standard and luxury goods comprised a dishwasher, a microwave oven, a satellite dish and a second car in the family. Even though all the above-mentioned items were found in a mere 1% of the surveyed rural households, the findings revealed that there were also rural families with a significant share of less common products. The role of such goods in the functioning of rural households has markedly increased in recent years, primarily as a result of the copying of urban lifestyle and the convergence of consumption patterns in Poland and in other EU Member States.

*Table 2. Surveyed households by equipment with selected groups of durable goods (%)*

| Specification | Surveyed households | | | | | |
|---|---|---|---|---|---|---|
| | total | | farming | | landless | |
| | 2000 | 2005 | 2000 | 2005 | 2000 | 2005 |
| refrigerator, television set, gas or electric cooker | 73.7 | 89.3 | 75.4 | 91.4 | 71.7 | 87.6 |
| refrigerator, television set, gas or electric cooker, automatic washing machine | 43.7 | 61.5 | 44.7 | 66.1 | 42.8 | 58.1 |
| refrigerator, television set, gas or electric cooker, automatic washing machine, vacuum cleaner | 42.0 | 59.4 | 43.0 | 64.0 | 41.2 | 55.9 |
| video cassette recorder, automatic washing machine, wired telephone, television set | 18.2 | 28.4 | 21.0 | 33.6 | 15.9 | 24.4 |
| refrigerator, microwave oven, food processor, automatic washing machine | 4.9 | 9.0 | 5.9 | 10.8 | 4.1 | 7.6 |
| refrigerator, microwave oven, food processor, dishwasher | 1.1 | 2.2 | 1.0 | 2.5 | 1.0 | 1.9 |
| satellite dish, personal computer, mobile phone, video camera | 0.6 | 2.6 | 0.6 | 2.9 | 0.6 | 2.4 |
| dishwasher, microwave oven, satellite dish, second car | 0.3 | 0.9 | 0.3 | 1.1 | 0.3 | 0.6 |

*Source: 2005 survey by IAFE-NRI.*

Analyses of the findings from the survey have shown both improved equipment of rural households with durable goods in 2000-2005 and a marked advantage of farming families over the landless rural population in this respect. Considering the above-mentioned indicators of equipment with durable goods and changes in this respect, it can be concluded that aspirations of the surveyed rural families reflect changing consumption patterns towards higher-order values.

## Conclusions

The equipment of households with durable goods should be seen as an important indicator of rural household wealth in Poland (in addition to purchasing power parity, savings, and expenditure structure). The results can also be interpreted in terms of civilisation advancement (in areas such as the number of telephone lines, computerisation, and access to Internet).

First of all, it should be emphasised that equipment significantly varied between specific types of households and within the surveyed groups. According to the conducted survey, in 2005 all the devices defined as common goods (i.e. a refrigerator, a television set and a gas or electric cooker) were owned by 89.3% of rural households (91.4% of farming families and 87.6% of landless households). Nearly two-thirds of rural families

had such equipment plus an automatic washing machine. A similar number of households owned a refrigerator, a television set, a washing machine and a vacuum cleaner at the same time. Devices and appliances which can be described as "once luxury goods" (i.e. a video cassette recorder, an automatic washing machine, a wired telephone, a television set) were found in almost one-third of rural families. Nearly every tenth family used a refrigerator, a microwave oven, a food processor and a washing machine. In significantly fewer households (a total of 2.2%) the kitchen was equipped with all the modern devices and appliances: a refrigerator, a dishwasher, a microwave oven and a food processor.

Only a minor share of the surveyed rural families (approx. 2%) owned modern equipment enabling wider contact with the world and popular leisure activities. Such devices included a satellite dish, a personal computer, a mobile phone and a video camera. The findings revealed that there were also rural families with a significant share of less common products (defined as luxury goods), and the role of such devices and appliances in the functioning of rural households has markedly increased in recent years.

Considering the discussed indicators of equipment with durable goods and changes in this respect, it should be emphasised that aspirations of the surveyed rural families reflect changing consumption patterns towards higher-order values. In general, it should be recognised that the period in question witnessed positive changes in the living standards of the rural population. As for rural household equipment, a significant improvement was observed with regard to technical installations as well as specific durable goods and their categories. It is particularly important that a growing number of rural families own personal computers and have Internet access since the rapid development of this medium in all areas of social and economic life also makes it possible to modernise the organisation and information spheres of agriculture and to activate rural areas.

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Economics of agriculture
SI – 2
UDK: 334.73 (497.2)

# AGRO POLICY AND STRATEGIES IN BULGARIA'S COOPERATIVE MOVEMENT

*Darina Zaimova*[1]

## Abstract

*This paper is firstly aimed to propose a conceptual framework exploring institutional and economic development of cooperative movement in Bulgaria. Secondly it aims to assess the impact of reforms under way in the national economy.*

*The main research questions assign to:*

- *Which features of institutional framework hinder or give priority to sustainability of cooperative development?*
- *What are responsibilities and interests of public and private sector in shaping the vision of cooperatives?*
- *What is the importance of property rights protection to common utilization of agricultural components?*

*The methodology section is based on: a background description of national survey data; an observation of changes in dynamics between formal and informal institutions; in-depth analysis of decision-making process adopted by cooperatives.*

***Key words:*** *Bulgarian cooperatives' models, enforcement regime, property right protection*

## Introduction

Sustainability of the cooperative movement is determined by the established mechanisms of coordination and control of the formal institutions (laws, policies and regulations, political and economic rules) over the stakeholders in the agro industry chain. These relations are important prerequisite for an adequate policy implementation and comprehensive strategies formulated as a result of the interaction between the government policy and representatives of the agricultural sector.

## The Cooperatives' development and relations

Agriculture as a part of Bulgarian economy provides a whole range of economical, social and environmental services and has a rich cooperative history and tradition. The first cooperative was established back in 1890 in the village Mirkovo and since then cooperatives have become an important incentive for the development of the

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sector. From this starting point the institutional concept of the cooperative movement is marked by the influence of the following components:

- governance policy and co-ordination mechanisms,
- property rights,
- stakeholders' interests,
- organization of the transaction.

From the historical perspective three basic models of the development of the agricultural sector are broadly introduced: early capitalism, socialism and the transitional model. Bulgaria's accession to the European Union has specified the fourth one – the model that is inspired by the Common Agrarian Policy and followed its ideas and principles.

Bulgarian agriculture during the period before World War II can be described by the following features – small owners, low productivity and primitive technical level. The economic crisis in 1930 had deepened the problems in the sector and its backwardness.

In the philosophy of the second model of the socialism as a background is the idea for the social equality. Collectivization put it into practice by liquidation of the land ownership and distribution of the land equally to the landless or very small owners. The process was not an easy task as 80 percent of the population earned their incomes from farming. Reforms during the socialist period were performed on *three stages*:

- The agrarian reform started in 1946 with the expropriation of the land from families who owned more than 20 ha. In four years the result was that 98 percent of land was utilized by collectives or the so called Labor Collective Agricultural Farms. The main features of these collectives is that membership in them has transformed the farmers simply to laborers and has changed their motivation and interest in the production performance.
- Agrarian Industrial Complexes were established on the second stage of the reforms. These organizations were state property and particularly they are the result from merging the collectives into state owned agricultural units. Again the producers' incentives were underestimated which have led to moral hazard problems, adverse selection and opportunism.
- The third stage was the final result of the reform: the crisis affecting agriculture in the 1980s led to the collapse of Agrarian Industrial Complexes and re-organization of the agricultural production again in the collective units.

During the pre-accession period the agricultural sector has experienced major changes including market specification, environmental and food safety requirements and service access issues. One of the main characteristics of the transition from a centrally planned to a market economic is the transformation of cooperative structures into new organizational forms in order to achieve more rational distribution of the production resources and effective realization of the agricultural production. Back in 1996 the Bulgarian agricultural policy was characterized by short-term measures on price policy and direct support to producers based on subsidized short-term seasonal credits. In 1995

Agricultural producers' protection act[2] was passed, which regulated the government role in creating and maintaining favourable economic conditions for the sustainable development of a competitive agricultural sector. Three years later the Law was entirely processed and the new Law on assistance to agricultural producers was approved. Following the recommendations of the international institutions the Government proposed a package on agricultural policy based on the legal framework adopted by previous governments but incorporated into the new stage of macro-economic stability.

*The common problem was the missing link between the representatives of the agricultural sector and the government that results in low motivation for participation in the decision-making process.*

As a consequence the main characteristics of the transforming agricultural sector are:

- limited opportunity for producers to participate, control or modify their relations with processors, suppliers and retailers and also to take part and have control over the process of pricing;
- individualism is one of the main characteristics of agricultural relations, which results in mistrust in different types of organization;
- the weak initiative of entrepreneurs, which limits the opportunities for market success.

One of the measures in the National agricultural and rural development 2000-2006 is measure 1.5.: "*Setting up producers' groups*". The overall objective of the measure is to promote the setting-up of producer groups by providing financial support and in particular raising their margin, to secure market transparency and product-specific standards. By the end of July, 2004 in Bulgaria was recognized organization of tobacco producers – "The first association of tobacco- producers in Bulgaria EVRO -2004" – LtD on the criterion "volume of produced goods" – they declared 1 873 030 кg of tobacco. In 2004 the cooperative of fruit producers "Evrofruit-2004" based in Plovdiv was also registered as well as the "Association of Tobacco producers 2003" LtD based in the village of Listets, district of Silistra.

After 2007 the policy initiative became more focused on the development of the cooperative organizations and the vision of the legislative base grew more purposeful. In 2009 the National strategy for the sustainable operational programs of the producer groups (fruit and vegetables) in the Republic Bulgaria (2009 – 2013) was accepted. The functioning of these organizations is based on the European legislation - in particular the Regulation 1234/07[3] for the establishment of the Common organization of agricultural markets and Regulation 1580/07[4] of the Committee for applying the

2 Agricultural producers' protection act, Promulgated State Gazette No. 57/23.06.1995

3 Council Regulation (EC) 1234/2007 of 22 October 2007 establishing a common organization of agricultural markets and on specific provisions for certain agricultural products (Single CMO Regulation)

4 Commission Regulation (EC) 1580/2007 of 21 of December laying down implementing rules of Council Regulations (EC) 2200/96, (EC) 2201/96 and (EC) 1182/2007 of the fruit and vegetables sector

Regulation 2200/96[5] and 1182/07[6].

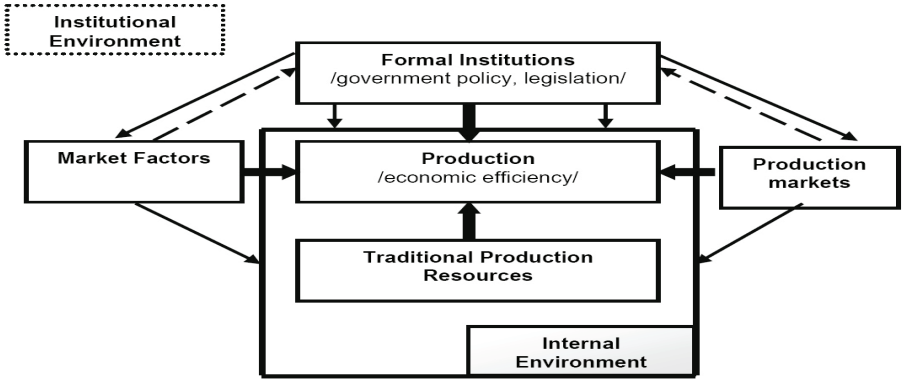
**Institutionalization of the agrarian sector**

The results form the policy endeavors to stabilize the agricultural sector shed light to a conceptual problem connected with the multiplicity of the meaning of the key term "institution" and how the various aspects of the political systems are related to one another. The economic literature suggests differentiating between institutional environment and institutional arrangements[7]. The institutional environment includes formal constraints and rules (government policy, legislation), while the institutional arrangements are the mechanisms coordinating the economic transactions.

In practice a great part of coordination and product specification is realized through contract arrangements. These contacts imply new risks for producers, which require an appropriate organizational form to negotiate and administer these contracts. Against this backdrop the government policy plays a central role in the efficient organization of economic exchanges in the agricultural market by laying the foundations for improvement of the contractual performance and reduction of the transaction costs.

Efficient relationship between the formal institutions and the strategic choices of the economic players results in transactional trust between contracting parties, property rights protection and transparency (figure 1).

*Figure 1 - Institutionalization of the economic transactions*




*Resource: Modified Curtiss/2002: 20/*

5 Council Regulation (EC) 2200/96 of 28 October 1996 on the common organization of the market in fruit and vegetables

6 Council Regulation (EC) 1182/2007 of 26 of September laying down specific rules as regards the fruit and vegetable sector, amending Directives 2001/112/EC and 2001/113/EC and Regulations (EEC) 827/68, (EC) 2200/96, (EC) 2201/96, (EC) 2826/2000, (EC) 1782/2003 and (EC) 318/2006 and repealing Regulation (EC) 2202/96

7 Davis and North (1971), Institutional Change and American Economic Growth. Cambridge University Press

Opinions about the responsibilities of the public and private sector in shaping the vision of the cooperatives are often controversial. Collaboration between them can result in optimal exploiting of the market opportunities and potential (table 1).

*Table 1 - Collaboration between public and private sector responsibilities*

| Issues | Public Sector Initiatives | | Private Sector Initiative |
|---|---|---|---|
| | Investment Activity | Legislation | |
| Market access | Infrastructure Investments and Information Campaign | Improving enforcement regime | Collaboration, Initiative among producers |
| Quality | Sustainable management of natural resources | Environmental, food-safety requirements | Enhancing management capacity |
| Technical capacity | Extension services | New financing mechanisms | Diversification |

Clear concept of government policy is a prerequisite for an elaborated legislation. During the transition period in the Bulgaria's agricultural sector a high variation of the efficiency results was observed due to the changes in land ownership and in the organization of the property rights. Well established and enforced property rights secure control of assets as a critical component of sustainable economic organizations[8]. According to the conventional right property rights are divided in the following three categories: right to use, transform or destroy asset; to make profit from the use of assets; right to transfer ownership rights of the asset to another party.

Property rights result from the necessities of the contracting parties to organize their economic activity more efficiently. Bulgaria's government has initiated and passed regulations for establishing and improving the relationships across the agro industrial chain. An example of that kind of legislative act is the Regulation 104/2008 for organization and coordination of the management of the financial resources from the European Union funds. In accordance to it as a responsible administrative structure is pointed out the Agency "Rural regions' development". Another initiative is foundation of the Agro business council that includes representatives of the local branch organizations. This council together with the scientific council that was established in May, 2008 and is represented by members of the scientific agrarian community and experts from the Ministry of the Agriculture and Food are involved in solving and preventing potential problems of the companies from the agrarian sector. These are just examples of the measures taken at the government level in terms of law-making.

## Conclusion

The common understanding for government policy, institutions and cooperative structures gives closer look to their influence and importance for the agricultural sector.

8 Hanna, S. et al. (eds.) 1996. Rights to Nature. Island Press, Washington

Along with their initial functions cooperatives are often an alternative to improve the cost-efficiency and to secure sustainable development. They become also a chance for the producers to participate in the negotiation of institutionalized agreements, implementation of regional development plans and agricultural policy. Thus the role of the cooperative movement cannot be limited to "managing" situations created by agricultural policy or simple adjustment of reforms already under way. Producers become involved in shaping the future of agriculture, its place in the local and national economy, and the functions that it should perform.

Participation in these organizations can also bring significant economic benefits especially when the organization operates in agrifood chain with high transaction costs. Well-developed cooperative structures can create some regional specialization by bringing together producers belonging to the same region in the competition with other regions on the basis of their comparative advantages and the development of specific assets.

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Economics of agriculture
SI – 2
UDK: 631.15 (497.11)

# EVOLUTION OF AGRARIAN POLICY AND PRODUCTION PERFORMANCES OF SERBIAN AGRICULTURE[1]

*Stanislav Zekić, Milivoj Gajić, Koviljko Lovre, Marinko Kresoja, Milos Tošin*[2]

## Summary

*From the middle of the previous century until today, an analysis of the evolution of the agrarian policy in Serbia shows that various models of agricultural policy are influenced by ruling political and ideological motives. The period of socialist agriculture, which has since been followed by transitional changes lasting to the present day and is now reflected in efforts towards joining the EU, has, to a great extent, determined the developmental characteristics of Serbian agriculture. In that context, production performances of Serbian agriculture have been discussed considering agricultural production dynamics and the level and motion of partial agricultural productivity in comparison with European Union countries.*
***Key words:*** *Agriculture, Agrarian policy, Production performances, Serbia.*

## Introductory notes

In the period of the Second World War, the agricultural development model in Serbia saw significant changes. The agrarian policy transformed from ideologically colored policy focused on socialist transformation of agriculture to the agrarian policy under conditions of market economy and Serbia's progress towards the European Union (EU). The period of socialist agriculture is characterized by relatively stable growth of production and partial productivity all through the end of 1980s. The transition into the market economy system has been facilitated owing to the fact that most agrarian funds had already been privately owned. However, the initial transitional period was marked

1 The paper presents a part of the research for the project organized by the Ministry of Science and Technological Development of the Republic of Serbia: Multifunctional agriculture and rural development in the function of Serbia joining the European Union– 149007.

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by the influence of numerous non-economic factors which significantly slowed down the transformation process of agriculture. The agrarian policy of Serbia, in this period, was burdened by budget restrictions and *ad hoc* approach without clearly defined development strategy. Consequently, this led to cutback in agricultural production performances, particularly in the initial transitional period. It has to be noted that the full recovery has not yet been achieved.

## Evolution of agrarian policy of Serbia

The agrarian policy of former SFR Yugoslavia, the part of which was Serbia, differed from most other socialist countries because it did not involve mass collectivization of land. The main goal of the authority of the time was the socialist transformation of agriculture. It did, however, at one point, try to introduce collectivization (period between 1945-1953), but gave up quickly, since it led to serious problems in food production. This period is characterized by the shortage of food products, which is why the agriculture was one of the main causes of inflation.

At the end of the 1950s, a new concept of agrarian policy was defined. It favored social character of agriculture, but it also allowed rural households. This kind of agrarian policy model generated the so called bimodal character of agriculture, which granted various privileges to the social sector. On the other hand, the development of the private sector, due to ideological and political reasons, was restricted.[3] The input production and processing of agricultural products were within the scope of state/social sector of the economy, while prices were centrally determined and standardized based on more efficient and productive production in the social sector. Neither the 1980s saw significant turn in the concept of the agrarian policy, which means that basic characteristics from previous period were maintained. However, the end of the decade saw a gradual liberalization together with indications of the start of ownership transformation.

The strategy of agricultural development in the period of socialist system was not primarily of economic and development nature, but it was political-social-economic construction, which was supposed to enable the development of agriculture followed by social and economic relations in agriculture and in the village. (*Gajić M., 1990, p. 10*). Consequences were numerous and they reflected in unequal development of agriculture, that is, in different development performances of two sectors, which resulted in the growth rate reduction of the total production (*Lovre K., Gajić M., 1989, op.cit.*). The production in the private sector of agriculture had been mainly of a natural character. This is supported by the fact that, although there was over 80% of agrarian funds available – arable land, tractors and livestock fund, the realized purchase was below 50% (*Zekić S., 2003, p. 97*).

The last decade of the 20th century was marked by sanctions imposed by the United Nations Security Council. Consequently, this forced model of closed economy inevitably

3 Opportunities for expansion of the land fund of individual households were restricted by introduction of land maximum, ban on machinery purchase and alike.

led to drop in production, while the function of agriculture boiled down to meeting the food demands of the population. An agrarian budget was introduced in this period (1996), as a part of the total budget of the Republic of Serbia, with the goal of stimulating agricultural development. However, it was only after the relationship with the international community normalized that some major measures of agrarian policy were proposed.

Restrictions related to the scope of agrarian budget characterized the period after 2000 as well. Incentives referred mainly to the increase in the production scope, primarily milk production, as well as to the institutional adjustment support. A gradual reduction of market support and increase in the support aimed at improvement of agricultural structures is another feature of this period. The credit support granted to agricultural producers has grown in importance since 2004, while income support to agricultural producers was introduced in 2006. Support measures to rural development were introduced in 2004, but due to strict budget constraints at the macro level the support to investment development programs of rural regions in Serbia was very modest. The scope of export subsidies regulated for meat, milk, fruit, vegetable and alike, was not as wide (*Popović R., Zekić S., 2010, p. 107*). Incentives per one hectare of arable land for registered agricultural household up to 100 ha were introduced in 2008. Also, that same year, incentives for the production of sugar beet were granted. Furthermore, in the field of livestock production, the incentive for purchase of cattle for breeding was granted in the same year.

Generally speaking, the pricing policy after 2000 has not been notably improved as compared to the previous decade. Direct support to farmers came down to determining approximate price for wheat, which was purchased by wheat milling companies. The support for industrial plants (sugar beet and tobacco) was retained to a certain degree. In this case, agreed prices were operationalized through processing companies, which were obliged to pay "official" price determined by the state. Subsidies were granted for milk, sugar beet, tobacco, heifers, breeding bulls, sheep, vineyards and orchards. Also, temporary support to hop producers was planned for 2005. Production subsidies were retained only with milk, while payments per size and head of cattle were introduced to other products

Liberalization of food prices eliminated vast consumer subsidies. As a result, the consumer price control referred only to determination of maximal price for so-called ”brown“ bread. Public storage, operational costs of state agencies and stabilizing interventions aimed at stabilizing the market were financed from the budget. The Directorate for Buffer Stock becomes the main source of subsidization through wheat generated income and provision of input and seasonal loans, thereby restricting the activity of the private sector within this market segment, which results in market distortion of production factors and final agricultural products (*Csaki C., Zuschlag A., 2004*).

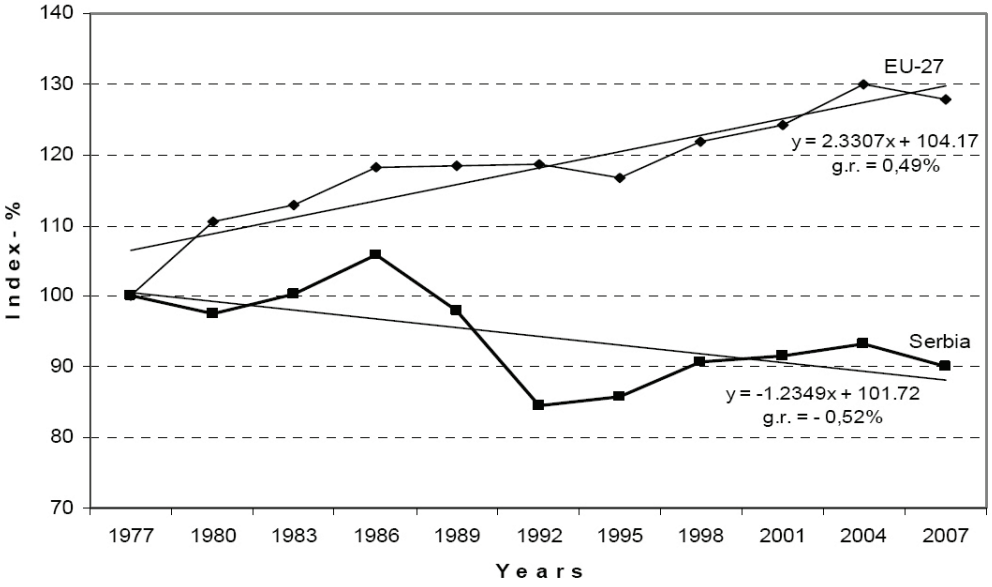
During the first few years of the first decade of this century the import protection of agricultural products in Serbia was significantly reduced. Customs were increased for meat and meat products as well as for milk and milk products, while the total custom burden was decreased for oleaginous seeds and fruits, industrial crops and medicinal herbs, coffee, tea, spices, edible fruit and alike (*Bogdanov N., 2004, pp. 118-120*). Export

quotas, export subsidies – which are definitely not high, and licenses are restricted, but export quotas for some basic agricultural products have been retained. Raw materials are frequently subject to high tariffs, from the point of protection of processed and semi processed products. A general VAT rate in Serbia amounts to 18%, but majority of agricultural products are taxed at the rate of 8%. The same rate is also applied for inputs such as – mineral fertilizers, plant protection chemicals and seeding material, whereas agricultural machinery and fuel is taxed at the rate of 18% (*Zekić S., 2008, p. 22*).

## Agricultural Production Performances in Serbia

Positive tendencies in agricultural production development in Serbia during the pre-transitional period were interrupted even before the introduction of transitional changes at the end of 1980s and beginning 1990s. Namely, it was already in 1986 that the volume of agrarian production decreased. This trend continued during the 1990s, so the all-time-low production volume, in the analyzed period, was reached in 1993.

*Figure 1: Dynamic of agricultural production in Serbia and EU- 1977-2007.*



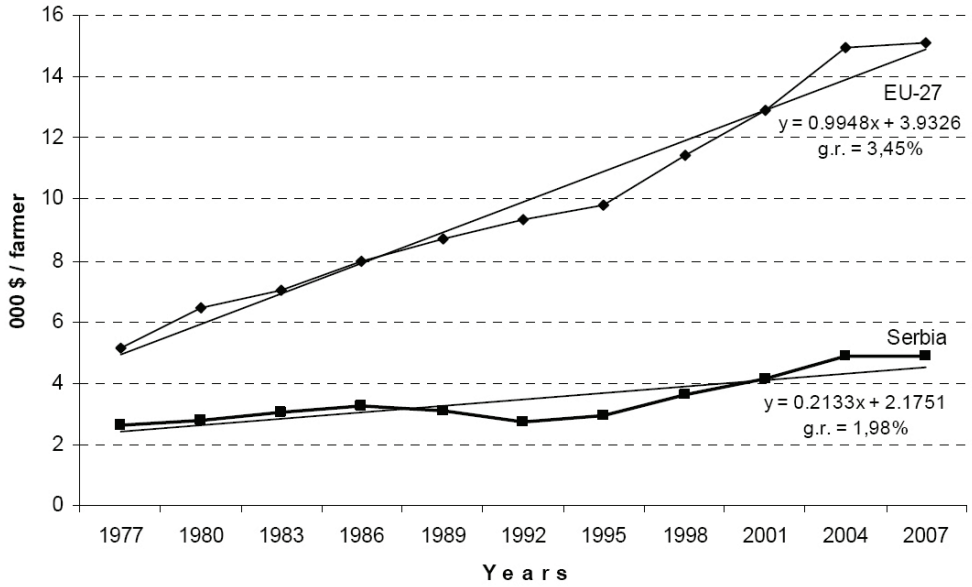

*Source: Own calculations on the basis of FAOSTAT.*

Having recovered from the initial transitional shock and considerable influences of some non-economic factors important for Serbian agriculture[4], the production volume of agriculture began to grow again. However, not even until 2007 did the production

4 The civil war in this region, economic blocade, bombing of industrial structures and and infrastructure and alike.

level reach the 1980s level. On the other hand, in the EU countries, with the exception of new members from Central and Easter Europe which, also, passed transitional changes, the agriculture saw a stable upward trend *(Figure 1)*.

*Figure 2: Labor productivity in agriculture of Serbia and EU - 1977-2007.*




*Source: Own calculations on the basis of FAOSTAT.*

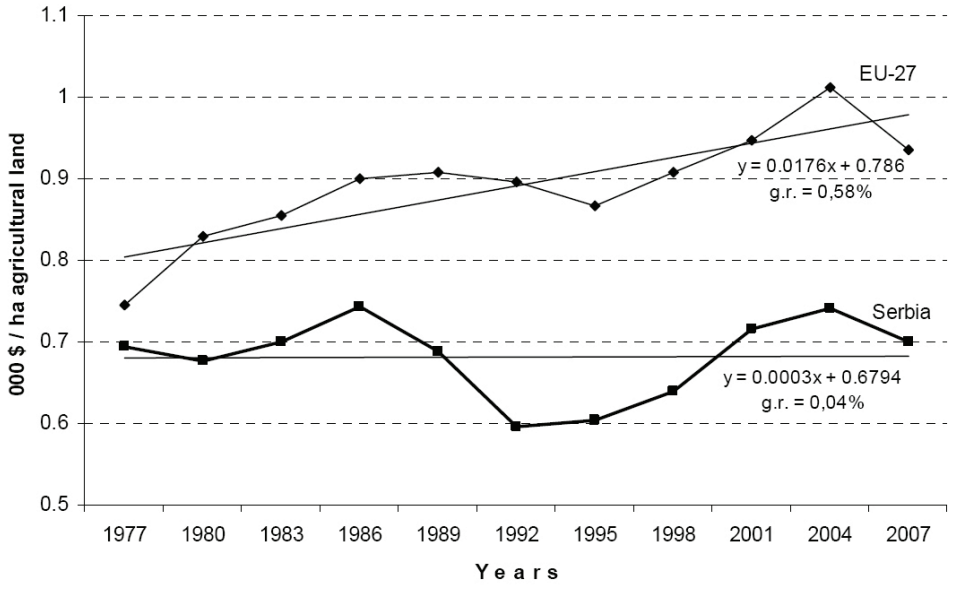
As Serbian agriculture has a positive trend in the work productivity,[5] the production per active farmer continued to grow even during the transitional period. The reason for this is a decrease in labor force which has been intensified in the last fifteen years.[6] Nonetheless, from the aspect of work productivity, Serbia is not only notably falling behind other EU countries, but this difference tends to rise in the future (*Figure 2)*. This is primarily due to unfavorable resource structure of Serbian agriculture that is relatively high number of active farmers per unit of agricultural land area.[7] Another reason is constraints in the budget of the Republic of Serbia and thus low incentives for the expansion of agrarian production.

5 Partial productiviy of agriculture – work productiviy and land productiviy, were achieved as a ratio between final agricultural production expressed in thousands US$ in 1990 (Prasada Rao D.S., 1993) per active farmer, that is, per hectare of agricultural land area (FAO-stat – www.faostat.fao.org).

6 According to the FAO estimate, the number of active farmers in Serbia, in the period between 1992 and 2007 fell by 40%, that is from a little over 1.2 million to about 700 thou-sand (FAOstat – www.faostat.fao.org).

7 In 2007, the average farmer in Serbia "had" around 7 ha of arable land available, while in twenty seven countries of the EU this figure amounted to 16 ha (Popović R., Zekić S., 2010, p. 105).

*Figure 3: Land productivity in agriculture of Serbia and EU- 1977-2007.*




*Source: Own calculations on the basis of FAOSTAT.*

The scope of agrarian production per hectare of agricultural land area in Serbia has not changed significantly during the analyzed period (*Figure 3*). Fluctuations in the productivity of land are, by rule, followed by fluctuations in production, since agricultural land areas do not change significantly.[8] Although the tendency of Serbia to lag behind the EU countries is more noticeable in the land productivity,[9] the range in the level of this partial productivity is lower as compared to work productivity.

## Concluding observations

The agrarian policy of Serbia, in the period after the Second World War, conditioned a bimodal development character of agriculture with dual production structure, which has negatively reflected on development performances of agriculture. This was followed by a transitional shock at the first half of the 1990s, which was additionally aggravated by numerous non economic factors, thus largely influencing the development of Serbian agriculture. The agrarian policy of this period was carried out in the conditions of closed economy during the period under sanctions, *ad hoc*

8 Average annual decrease in agricultural land areas in Serbia during the analyzed period (1977-2007) amounted to 0.56%. This tendency was a bit sharper in the second half of the 1990s (FAOstat – www.faostat.fao.org).

9 The gap in the productivity of land increased, primarily, due to more dynamic growth of agricultural production in the EU countries as compared to Serbia (Figure 1).

reactions, liberalization of prices and market, absence of adequate development strategy and strict budgetary constraints which led to a decrease in agricultural support. Consequently, production performances of Serbian agriculture deteriorated, which was primarily reflected in the production volume decrease. Current restrictions relating to the development of Serbian agriculture are caused by low level of work and land productivity, inadequate agrarian policy, which should primarily be focusing on stimulating production and export as well as structural changes in agriculture.

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Konsultantske usluge implementacije ISO i drugih medjunarodno priznatih standarda, alata i tehnika, koji se bave pitanjima obezbeđivanja, kontrole i unapređenja kvaliteta i zdravstvene bezbednosti hrane.

- ✓ *ISO 22000*
- ✓ *HACCP Sistem*
- ✓ *IFS*
- ✓ *GLOBAL G.A.P.*
- ✓ *ISO 9001*

Ostali standardi, alati i tehnike iz konsultantskog portfolia:

- ✓ *ISO/IEC 27001*
- ✓ *OHSAS 18001*
- ✓ *ISO 14001*
- ✓ *ISO/IEC 17025*
- ✓ *ISO/TS 16949*
- ✓ *FSC CoC*
- ✓ *CE znak*
- ✓ *PSP*
- ✓ *„5S“ Metoda optimizacije procesa*
- ✓ *Regrutacija i selekcija kadrova*
- ✓ *AIP Ananliza individualnih potencijala*
- ✓ *ltd.*

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